The Qualitative Report

Volume 27 | Number 11 Article 11

11-19-2022

How Things Take Up Space: A Grounded Theory of Presence and Lived Space

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Recommended APA Citation

Oblak, A., Boyadzhieva, A., Caporusso, J., Škodlar, B., & Bon, J. (2022). How Things Take Up Space: A Grounded Theory of Presence and Lived Space. *The Qualitative Report*, *27*(11), 2556-2582. https://doi.org/10.46743/2160-3715/2022.5762

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Abstract

In cognitive science, it is unclear what precisely presence (both in the sense of objecthood and immersion) refers to in lived experience. The present study addresses the research question of what the relationship between presence is and lived space. A hundred and seventeen phenomenological interviews were conducted with 14 participants. We sampled their experience in a transdiagnostic manner. That is, we observed how the experience of presence changes both in circumstances appraised as positive (e.g., sexual intimacy) and negative (e.g., psychopathology). Our grounded theory suggests that presence is a phenomenon that is comprised of all available sensory knowledge, however, it itself is not present in any one sensory modality. Presence takes the form of a disembodied sense of solidity. Our findings can be related to the notion of transmodality in contemporary qualitative phenomenology (i.e., the idea that there are some aspects of experience that can be readily translated from one sensory modality to another. Further, how presence (in its capacity as immersion) is related to lived space can shed further light on the formation of delusions, suggesting that it is based on sensory alterations rather than changes in belief. Finally, the observation that presence as it appears in lived space need not perfectly correspond to the objective situation, can elucidate extant discussion on whether presence is an amodal aspect of consciousness.

Keywords

presence, lived space, first-person research, transdiagnosticism

Acknowledgements

The authors wish to thank Sinja Miloševič for her help with preparing the manuscript.

The Qualitative Report 2022 Volume 27, Number 11, 2556-2582
https://doi.org/10.46743/2160-3715/2022.5762

How Things Take Up Space: A Constructivist Grounded Theory of Presence and Lived Space

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In cognitive science, it is unclear what precisely presence (both in the sense of objecthood and immersion) refers to in lived experience. The present study addresses the research question of what the relationship between presence is and lived space. A hundred and seventeen phenomenological interviews were conducted with 14 participants. We sampled their experience in a transdiagnostic manner. That is, we observed how the experience of presence changes both in circumstances appraised as positive (e.g., sexual intimacy) and negative (e.g., psychopathology). Our grounded theory suggests that presence is a phenomenon that is comprised of all available sensory knowledge, however, it itself is not present in any one sensory modality. Presence takes the form of a disembodied sense of solidity. Our findings can be related to the notion of transmodality in contemporary qualitative phenomenology (i.e., the idea that there are some aspects of experience that can be readily translated from one sensory modality to another. Further, how presence (in its capacity as immersion) is related to lived space can shed further light on the formation of delusions, suggesting that it is based on sensory alterations rather than changes in belief. Finally, the observation that presence as it appears in lived space need not perfectly correspond to the objective situation, can elucidate extant discussion on whether presence is an amodal aspect of consciousness.

Keywords: presence, lived space, first-person research, transdiagnosticism

Introduction

Presence refers to two dimensions of experience. First, it is the experience of objects of perception containing more detail than is immediately present to our senses. They appear as three-dimensional, voluminous (Wilkinson, 2020), and as objects in space (Husserl, 1997). Second, presence is the experience of objects of our perception as being "real" (Mausfeld, 2013) or belonging to what is experienced as the observer-independent world (Seth, 2014), rather than our imagination (Sartre, 2010).

Research on presence is faced with two "problems." First, in experience, objects appear to us in their entirety, as integrated wholes, rather than drafts of immediate sensory inputs (e.g., in vision, objects appear to us only from a single profile, but we are aware of their occluded side as well; so-called "passive synthesis"; Roy et al., 1999; Noë, 2012). The second problem is how, in religious experiences, unseen others (e.g., divine presence) can be experienced as "being there" in absence of sensory input (Erickson-Davis et al., 2021). This problem can be extended beyond religious experience. Unseen others can be experienced in a variety of other contexts (e.g., in psychedelic experiences; Letheby 2021; and in psychopathologies; Jaspers, 1997). In this paper, we are committed to this extended, transdiagnostic definition of the

problem of unseen others, focusing on the underlying phenomenology, rather than potential context-related mechanisms.

The two problems are canonically addressed by different constitutive disciplines of cognitive science: neuroscience (e.g., Seth, 2014) and anthropology, (e.g., Corwin & Erickson-Davis, 2020) respectively. Phenomenological tradition, however, has explored the phenomena of presence in detail. For example, phenomenology of mystical experiences relates presence to "verticality." Roughly speaking, while objects are "presented" to us (both through a single perceptual profile, and in their unity), vertical experiences are "revealed" to us (Steinbock, 2007) (e.g., as a striving towards divinity in religious experiences, or delusional atmospheres in psychopathologies; Parnas & Henriksen, 2016). Thus, phenomenology may provide a unified view, addressing both problems of presence.

In *Thing and Space*, Edmund Husserl (1997) proposes that to consciousness, first, there is an experience of extension in space, which is only secondarily filled with specific sensory content (e.g., color, illumination). Presence is constituted through an anticipation of the entire object, fulfilled through incoming sensory experiences as an individual explores this object (Ratcliffe, 2015). Maurice Merleau-Ponty (2012, p. 263) too writes about how expectations of sensory changes relative to movement (in contemporary terminology: "sensorimotor awareness") are the constituents of spatial experience: "My body is geared into the world when my perception provides me with the most varied and the most clearly articulated spectacle possible, and when my motor intentions, as they unfold, receive the responses they anticipate from the world."

Merleau-Ponty develops the discussion of the spatial constitution of presence by emphasizing embodiment and action. In line with the latter, Alva Noë (2012) proposes that the experience of presence is associated with skillful access to objects. Here are those objects that we can access through our sensorimotor awareness (i.e., those that can be potentially interacted with). In this way, even objects that are spatially distant from the observer are to some extent present.

Neuroscience of consciousness adopted many of the older ideas about presence, such as the anticipation-fulfillment structure (Varela, 1999) and the role of embodiment (Engel et al., 2016). Anil Seth (2014, 2015) integrates presence into the paradigm of predictive processing. Predictive processing claims that the world is too complex to be processed in its entirety. Rather, the cognitive system makes a series of informed guesses. Through these predictions, cognition eases the computational load, as it only has to process truly novel information (Clark, 2016). Seth (2014) proposes that the experience of presence depends on our cognitive system's unconscious predictions about how our sensations will change in response to movement.

However, it is unclear what level of description sensorimotor awareness belongs to or how best to study it. In the field of psychopathology, this gap in knowledge presents a particular challenge. Namely, it is unclear whether alterations of presence constitute a perceptual change (i.e., more closely resemble hallucinations) or a change in belief (i.e., more closely resemble delusions; for an extensive discussion on this issue, see Bayne & Pacherie, 2004; Campbell, 2001; Hohwy, 2004). It is likely that determining the level of description of sensorimotor awareness and how it is impacted under various conditions will prove valuable in further understanding of psychiatric disorders (under novel frameworks, such as "Research Domain Criteria," where precise differentiation of unit of analysis is of crucial importance; Cuthbert & Kozak, 2013). Further, in the broader context of cognitive science, there is an ongoing project, referred to as "neurophenomenology" (Varela, 1996), which attempts to understand how conscious experience can arise from unconscious matter. Without a precise specification of the experiential dynamics of sensorimotor awareness, its neurophenomenological understanding is impossible.

In a phenomenological study presented in Oblak, Boyadzhieva, and Bon (2021a), we proposed that, in lived experience, presence corresponds to four phenomenological properties:

1) the amount of sensory experience that can be obtained from real-world objects appears inexhaustible
2) objects occupy a particular part of "lived space" (i.e., space as it appears in experience, as opposed to objective space), which appears to be denser than empty space
3) objects allow or disallow specific bodily interactions
4) objects afford interaction such that higher-order couplings between objects and observers are formed. When violated, this interaction is experienced as "strangeness"

How, in lived experience, presence is related to lived space, remains understudied. In lived space, presence is not reserved for objects that possess materiality (i.e., objectively existing extension). Rather, lived space also consists of vectors and forces that direct or preclude an individual's movement (Albertazzi, 2015; Fuchs, 2007). In *Being and Nothingness*, Jean-Paul Sartre (2018, p. 400) describes two soldiers meeting on the battlefield. One of them aims a rifle at the other. The latter immediately stops, being aware of the line in space connecting him with the rifle. When the first soldier lowers his weapon, the line disappears, and the second soldier is once again able to move.

Sartre (2018) goes on to suggest that objects are present to consciousness not in their absolute objectivity, but rather as probabilities. In their critique of representationalism, Jan Degenaar and Erik Myin (2014) imagine a situation in which a piece of furniture one is used to walking around in her home is removed. For some time after, the person still avoids the area where the object was as if it were still there. Degenaar and Myin focus on behavioral engagement with space to make sense of the person avoiding the absent objects. However, phenomenal data suggest that we can attend to objects both as how they impact our bodies and how they constitute the world as it appears in our experience (Oblak et al., 2021a; Petitmengin et al., 2009). We can therefore suggest that it is not only bodily memory that drives the person to avoid the missing objects. Indeed, to her, the object may still be spatially present, as a solid echo of an object formerly placed there.

Lived space has been widely researched within descriptive psychopathology. Thomas Fuchs (2005) reports on how in depression, individuals feel spatially distant from the world around them, as if there is a void separating them from their environment. In social anxiety (Trigg, 2017), Moebius syndrome, and schizophrenia (Krueger & Taylor Aiken, 2016), individuals experience being separated from others by invisible blockades and barriers, preventing their access to a common social space. For some patients with schizophrenia, the depth of space changes, everything becoming distant or two-dimensional; the real space becomes superimposed onto a different, unseen but felt space. Patients can experience merging with their environment or specific objects. Further, their lived space may become pathologically geometrical, everything obtaining a location within a coordinate system (Silverstein et al., 2017).

Ethnographic studies provide us with additional accounts of lived space. In Cuban spiritual practices, for instance, bodies of knowledge are associated with perceptual changes, experienced as viscous flows in an individual's sensory field (Espirito Santo, 2015). Andrea Franchetto (2020) describes how in ritualistic contexts, such as on a prayer rug, the air around the worshipper may be experienced so "solid" as to be impassable. It has been noted that unlike in Western societies, where objects represent discrete units, separated by areas of nothingness, in Japan, empty space is experienced positively, as relations or ties between objects (Bachnik,

1998). Space occupied by an individual's body is subject to change as well. In *The Hidden Dimension*, Edward T. Hall (1996) reports on how in Arab culture, the locus of self does not correlate with the boundaries of the skin but is experienced deeper in the body. Conversely, contemplative practices such as meditation can lead to the sense of boundaries between the self and the environment dissolving (Ataria et al., 2015; Caporusso, 2022; Caporusso & Demšar, 2020).

To recapitulate: in the broader context of cognitive science, presence represents a central object of enquiry. Its investigations, however, are oftentimes limited by a poor understanding of how presence appears in lived experience. Our earlier research has already pointed to a marked importance of spatial cognition for presence (Oblak et al., 2021a). Our aim is to further explore the relationship between presence and lived space by describing presence in different mental and contextual states. We hope that a transdiagnostic investigation of presence will advance our knowledge of this phenomenon both in the context of future studies within the fields of neuroscience and psychology, as well as provide deeper understanding of the lived experience of alterations of presence in the context of psychopathology and psychiatric care. By extension, this study is geared towards researchers in cognitive science and psychopathology, as well as mental health practitioners and patients who want to better understand alterations of presence "from within."

Presence in its capacity of objecthood is also referred to as *Leibhaftigkeit* (Pacherie, 1999), or "being there in the flesh" (note the use of the word *flesh* or originally *chair* in Merleau-Ponty's thought where it refers to how we come to know the world with our bodies; Merleau-Ponty et al., 1968). Our investigation of presence began early in 2020 during the Covid-19 lockdown, when contact "in the flesh" suddenly became impossible. For the leading authors (A.O., J.B., B.Š.) this phenomenon became of interest from the perspective of psychopathology, as presence, both world to us, and ourselves in the world, became something that we were deprived of. The leading authors all work at the University Psychiatric Clinic Ljubljana, as researchers in the fields of psychopathology and cognitive science, and psychiatrists (J.B., B.Š.). To them, a deeper understanding of how lived experience is changed under varying conditions is the central research preoccupation. Additionally, the principal investigator (A.O.) was contacted by several people who were struck by the changes in their lifeworld, and who sought an outlet where they would be able to talk about them. The conditions of the lockdown further made interactions with students (A.B. and J.C.) difficult. Informed by these difficulties, we started reaching out to different individuals if they would be willing to explore alterations of presence with us in the times when we were deprived of presence "in the flesh." The video conferences commonly began with a friendly discussion of the lockdown and the pandemic situation, before gradually moving onto a more systematic conversation of presence. Both the researchers and the participants report that these systematic interviews provided a much-needed contact with others during the period of mandatory (self)isolation. A final note on the context of the research; The principal investigator (A.O.) was motivated to conduct this study due to his own struggle with mental health, wherein alterations of presence were a common experience for him.

The following supplementary materials (SM; made available here: https://osf.io/muvzq/) are referred to throughout the paper:

- SM-A: Raw data, including participant properties, overview of the sampled experiential episodes, interview transcripts and their English translations
- SM-B: The annotated codebook

Method

Starting Assumptions

Five starting assumptions need to be clearly stated. Firstly, presence can be considered both as the presence of an object "to" an observer (i.e., "objecthood"; Pacherie, 1999) or presence of an observer "in" the world (i.e., immersion*;* Seth et al., 2012). We investigate presence conceived of both as objecthood and immersion. Further, many authors (Corwin & Erickson-Davis, 2020; Klauser, 2021a; Noë, 2012; Ratcliffe, 2015) have emphasized the active nature of presence. In other words, presence is contingent on attitudes, dispositions, and manners of interactions with the world. Both active (i.e., presence as it is achieved by the experiencing individual) and passive dimensions (i.e., presence as experienced in absence of specific mental acts) of presence are investigated in this study. We remain agnostic in terms of the doxastic component of presence; that is, how the belief that a particular object is real is enacted (for a discussion of this phenomenon, see Klauser, 2021b).

Secondly, phenomenology is most conceived of as a practice of philosophical reflection. As such, its main method is "eidetic variation": a thinker imagines as many possible ways as she can as to how a given phenomenon might appear to consciousness to reach the essence of a specific aspect of consciousness (Husserl, 2012). However, our goal is placed within the narrower field of phenomenological psychopathology. Thus, we find it imperative, we gather data from individuals who have, in earnest, experienced states that we are investigating. We thus understand phenomenology as a practice of qualitative inquiry, wherein different ways in which phenomena appear to consciousness refer to different individuals who had experienced them, as well as different contexts in which they were experienced.

Thirdly, we adopt the transdiagnostic approach to investigation of psychopathologies. According to the World Health Organization, mental health is conceived of as a continuum between illness and wellbeing (WHO, 2005). It is therefore sensible to investigate the alterations of presence in a wide range of experiences, rather than confining them to a single diagnosis (Stanghellini et al., 2017). Both positively and negatively appraised episodes were explored. The common thread was the condition of non-normativity, as evaluated by the experiencing individuals. In this way, we are operating within the framework of "philosophical psychopathology" (Graham & Stephens, 1994), which roughly states that we can learn about the workings of consciousness by looking towards both positive and negative alterations of phenomena that are of interest to us.

Fourthly, while the study that we are presenting in this paper is qualitative phenomenological, its overall methodological-analytical framework falls within the domain of "constructivist grounded theory" as put forward by Kathy Charmaz (2004). We follow constructivist grounded theory in several of its dimensions. Firstly, we are committed to constructivist epistemology, which, in the context of qualitative research, means that we do not consider our data to point to observer independent phenomena. Rather, we hold that our findings constitute contingent phenomena that were achieved through the mutual negotiation of meaning by the interviewers and participants (Mills et al., 2006a, 2006b). Second, we aimed at gathering as much data as possible. This was done so that every aspect of our ultimate theory is grounded in the data themselves (cf., Charmaz, 2004). Finally, we employed so-called "theoretical sampling." That is, when provisional categories based either on theoretical or philosophical discussions relating to presence, our earlier studies (Oblak et al., 2021a) or newly emerging categories from this study were identified, we subsequently gathered additional, novel data to verify their stability. Our overall approach to theory-construction was therefore inductive-deductive. This approach yielded a constructivist grounded theory of the phenomenon of presence. According to this grounded theory, presence is viewed as

foundationally being related to lived space (i.e., space as it appears in experience). Objects that are made present to consciousness constitute a transmodal aspect of experience, like the experience of *Leib* (i.e., the lived body; Fuchs & Schlimme, 2009). According to this theory, which is below summarized in Figure 2), presence is a changeable aspect of experience, based on integration of multiple streams of sensory information.

Finally, in the presentation and discussion of findings we organize our data in the form of information flow (see Figure 2). We are aware of the conceptual discussions surrounding the notion of information processing in cognitive science (Hutto & Myin, 2012). At no point do we make a commitment to the information processing paradigm within cognitive science. The schematic depictions are meant to serve as heuristics for the future generation of testable hypotheses (McElreath, 2020).

Sampling

14 participants signed an informed consent to participate in the study. The informed consent consisted of a consent to (a) take part in the study; (b) have audio recordings of the interviews be made; and (c) the use of verbatim anonymized citations in the final study report. The study was reviewed and approved by the Institutional Review Board of the University Psychiatric Hospital Ljubljana. As some of the interviews were conducted with patients regarding their psychopathology, two psychiatrists were involved in the study. The participants were either individuals trained in observing and reporting on their experience or individuals diagnosed with psychopathologies, interested in exploring them. Culturally, all participants were Central European (residing in Slovenia, Austria, Germany, or Italy).

The participants met up with the principal investigator (PI) to provide an initial overview of the experiential episode. If the episode conformed to the following inclusion criteria, participants were invited to further interviews:

1) The episode included an alteration of presence (i.e., one of the four phenomenological properties put forward in Oblak, Boyadzhieva, and Bon, (2021a)
2) The experience was vivid in their memory
3) If psychopathology was discussed, the conditions were in remission

Our goal was to account not only for normative experiences of presence as a specific arrangement of lived space, but its alterations as well. Thus, we sampled varied experiential episodes, ranging from (a) psychopathologies, (b) intense emotional situations, and (c) psychedelic experiences, to accentuate the similarities and differences in the experience of presence. For a detailed overview of sampled experiential episodes, consult SM-A, Subsection 1.1.

To assure mental well-being of our participants, when discussing psychopathology, interviews began with anchoring. First, a pleasant experience was discussed in detail. If the patients could not recall a pleasant experience, one was generated by the researcher (e.g., drinking a cup of coffee together via video conference, engaging in small talk about lockdown activities). Detailed hand-written notes of the anchoring experience were kept on hand. In case of adverse events, grounding techniques were used to bring the patients in contact with the here and the now. During the guided meditation, aimed at grounding the participants, references to the anchoring experience were made to remove them from negative experience and bring them into contact with positive experience. This had to be done only once, when during an interview, Participant 8, who had been diagnosed with a psychotic disorder, experienced a dissociation. As soon as the grounding process began, Participant 8 regained contact with her environment.

There were no adverse effects to her mental health either immediately after the interview or at one-year follow-up.

The interview, based on the method of empathy used in the field of descriptive psychopathology (Oyebode, 2008), had a tripartite structure:

a) Overall description of experience
b) Detailed exploration of the altered experience of presence
c) Description of the experience of spatiality

Wherever possible, each phase was explored in a separate interview session. If due to their own time constraints, participants were unable to attend multiple sessions, all phases of the interview were condensed into a single session. Occasionally, participants were particularly interested in their experience, and more sessions were conducted. Conversely, if participants could not commit their time to three interviews, the phases were condensed into fewer sessions.

Interviews began by grounding participants in the experiential episode. This was done by gathering descriptions of each experiential modality (visual, auditory, bodily, social, affective, and spatial; cf., Petitmengin, 2006). Afterwards, both open and closed-form questions were used to inquire into the experience. The interviewer guided the participant away from descriptions of folk-psychological theories, scientific theories about the mind, beliefs about experience, and generalities. The interviewer guided the participants towards subjective reports grounded in sensory experience, bodily feelings, mental gestures (operationally defined as changes in the lived world following subjective perception of something the participant does rather than something happening to them), and attitudes. Throughout the interview process, the interviewer attempted to empathize with the participant's experience (i.e., they used questions to attune themselves to the experience of the participant). Summary statements were used to check whether the researcher's understanding of the participants' experience was accurate. At the end of each interview session, participants were asked if there are any aspects of experience that were saliently present to them during the episode itself that have not yet been investigated. Only when they responded in the negative, the investigation of a specific episode was concluded.

Interviews were conducted by three interviewers: the PI and two researchers. The PI conducted 80% of the interviews. The researchers conducted 11% and 7% of interviews. 2% of samples are based on archival data (e.g., journal notes participants took during the experiences themselves).

Analysis

Fourteen participants came in for a total of 117 interviews (on average, 8.5 per participant). 43 experiential episodes were explored. Interviews lasted, on average, 54 minutes (SD = 16.12). Three interviews were cut short due to overwhelming emotional content. In these situations, grounding techniques were used to guide participants into the present moment, and a debriefing was conducted to ensure their mental wellbeing.

Interview recordings were transcribed verbatim. Relevant bodily gestures were described in the metatext (for transcription convention, see SM-A, Subsection 1.2). When participants decided to illustrate their experience with drawings, their scans are made available in the transcripts. Interviews were conducted either in Slovene or English. Forty-one interviews were conducted in Slovene and were subsequently translated into English for greater transparency. All transcripts and translations are made available in SM-A. One interview

recording (AEP-11-01-04[1]) was corrupted, and the sample was reconstructed from notes contemporaneously taken by the interviewer.

We employed contemporary techniques for collecting phenomenological data. While dedicated analytical approaches exist for these techniques exist (Petitmengin et al., 2018; Valenzuela-Moguillansky & Vasquez-Rosati, 2019), work in our own lab demonstrated that this analysis procedure is difficult to execute based on published literature alone (Dragan, 2022). To ensure transparency, we thus followed more established analytical frameworks; namely, constructivist grounded theory (Charmaz, 2004) The main analytic tool was coding: assigning descriptive tags to sections of raw text (Charmaz, 2004). Specifically, the data were analyzed using inductive-deductive coding; that is, experiential categories were based both on the meaning emerging from the text (Flick, 2009) and insights from the literature (Charmaz, 2004; Zahavi, 2019). This two-way approach (i.e., inducing novel properties from the data, while deducing existing properties from theory) was chosen to demonstrate where qualitative data confirm or reevaluate existing ideas. It is to be noted that this focus on inductive-deductive coding (as well as sampling from existing philosophical ideas) constitutes a departure from the methodological framework of grounded theory. This is because the present study represents a second stage of a broader research endeavor. For a completely inductive approach to the phenomenon of presence see the study presented by Oblak, Boyadzhieva, and Bon (2021a).

The codes were subjected to relational coding (Flick, 2009): meaningful relationships were established between experiential categories. What is to be noted is that even the relationship between experiential categories had to be grounded in the data, rather than based on the intuition of the researchers. This was done through the construction of the annotated codebook (an instrument consisting of a codebook and a saturation grid; Nelson, 2017). In the codebook, all categories were defined according to:

- a name
- a description
- subcategories
- comprehensive list of examples
- considerations (e.g., specific differences between similar categories)

The entire annotated codebook is made available in SM-B. A saturation grid was used to determine whether enough data were gathered. Saturation grid refers to a tabulation where columns represent participants, and rows represent experiential categories. First and second occurrences of categories are noted in the cells. The saturation grid demonstrates a convergence towards a point where no new categories emerge (after 53 interviews; Fusch & Ness, 2015). However, following Charmaz (2004) we considered the researchers' ability to write up a study report an important criterion of validity as well. An earlier attempt to write up the study was made after 65 interviews had been conducted. Writing the manuscript made it apparent that the phenomenon in question was not understood well enough for the study to be over.

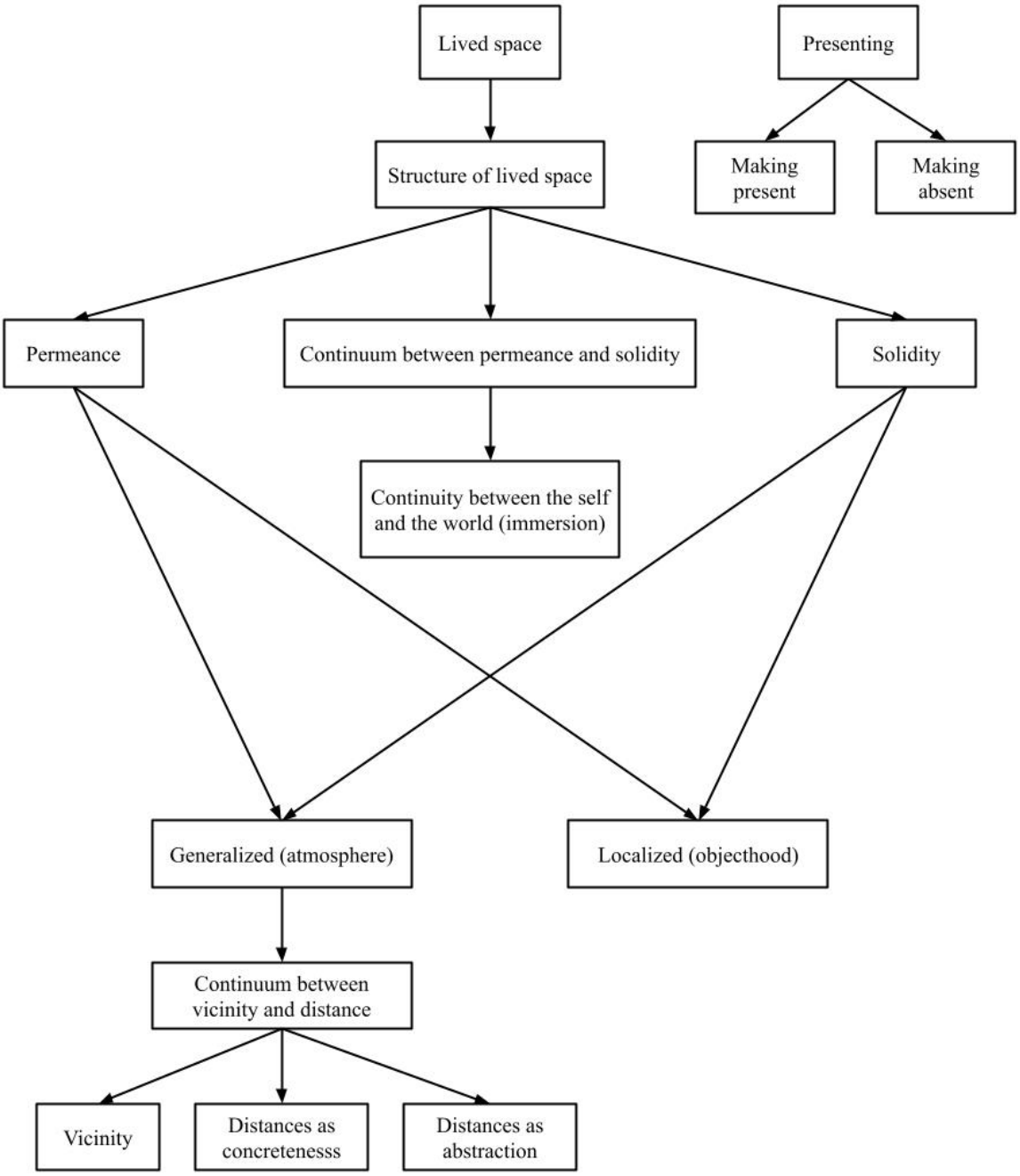
Additional validity of the study was evaluated using "intercoder verification": the final structure of the annotated codebook was agreed upon by all three analysts (A.O., A.B., and J.C.).

[1] Sample codes are structured as follows: *AEP - Participant number - Experiential episode number - Interview number*.

Results

In this study, we aimed at constructing a grounded theory of the relationship between presence and lived space We used inductive-deductive coding to construct several experiential categories (summarized in Figure 1) In the following subsections, we explore these experiential categories in detail.

Figure 1
Taxonomy of Experiential Categories



Notes. Arrows denote superordinate relationships between categories.

On the highest level of abstraction, we constructed the category lived space. Lived space contains one subcategory: structure of lived space, referring to the experience of extension. Structure of lived space contains two subcategories: permeance and solidity. Permeance is the experience of empty, fully traversable space. Solidity is the experience of some part of the world being occupied. Permeance and solidity are not conceived of as discrete states. They exist on a continuum, where some areas may be experienced as more or less solid relative to other parts of the world. A specific subset of this continuum is the experience of continuity between the self and the world. Both permeance and solidity can be experienced as generalized or localized. Generalized experiences refer to the overall spatial sense of the environment in which an individual is located. Localized experiences refer to the spatial experience of concrete objects. Generalized experience of lived space contains one subcategory: continuum between vicinity and distance. This experiential category refers to how the structure of lived space changes depending on how far away an individual experiences some part of the world (ranging from vicinity, distance as concreteness, to distance as abstraction). Finally, the experiential category presenting refers to the willed mental act whereby some aspect of the world is made more (making present) or less present (making absent) to consciousness.

Structure of Lived Space

We understand presence as a particular experience of lived space[2]. Namely, we propose that presence is related to the experience of "structure of lived space." This category refers to the world being experienced as a particular arrangement of "solidities" (i.e., areas of relative density) and "permeances" (i.e., areas of relative emptiness). The interplay between "solidities" and "permeances" is dynamic, creating a sense of movement and forces which may facilitate or hinder bodily action. Let us first examine the "localized structure of lived space"; that is, presence as it pertaining to a single, localized object.

"Solidity" is conceived of as "transmodal": it is not present in any one sensory modality, but is constructed from all available modal experience, while itself appearing as a novel modality: a feeling of density, located beyond one's body. One participant, while lying on her bed next to her boyfriend, felt his presence through the heat radiating from his body, and the weighty tension on the sheets:

> My boyfriend was to my left. […] I was aware of the energy of his mass and volume […] It was his heat. And then there's something more meta than that […] I felt him through the heat and the mattress. […] Through smell. [...] This is not something you can see but feel. [...] As if there's a kind of shell around you. (AEP-02-01-01)

Even beyond the field of vision, people can experience the presence of others. Dancing in a nightclub, one participant made a connection with a person whom she perceived as a guardian and a source of positive energy. Even while facing away, he was present behind her though the "solidity" in the "structure of" her "lived space": "I generally felt that this like [pause] positive energy and it felt like from behind there's this like big [sighs], um, statue." (AEP-03-01-01) The following report further suggests the transmodal nature of the "structure of lived space": "[this density of space] was some sort of mixture of you smelling the other person a little bit, and, like, there being just some sense of heat" (AEP-06-01-01).

[2] Whenever we refer to experiential categories as constructed within this study, they are written out in italics.

"Solidity" is commonly associated with a person's own embodiment. Consider the following report of an experiential episode in which a Participant 13 took 2C-B, a synthetic psychedelic:

> I felt my body, but it didn't really feel as a body because I felt it so strongly that [pause] it didn't feel like my body normally feels. So, it was just a sort of fairly dense area. It was everywhere. [...] I couldn't really locate my body parts anymore. (AEP-13-01-01)

On the other end of the spectrum of the "structure of lived space" there is the experience of "permeance." Participant 13 hallucinated castle-like structures emerging from the texture of the wall. It was through their lack of materiality that she discerned that they were not real-world objects: "[T]he castles didn't look very much like they were hard. [...] And they were also less material. Or they seemed like they were less made out of the wall. [...] [T]hey were [...] not as solid anymore" (AEP-13-01-02).

Participant 6 describes how during sexual intercourse, there is an interplay between the expectation of touch and arousal, and a focus on her own sensory experience. In lived experience, this interplay corresponds to a change in whether the space between the two bodies is experienced as "solid" or "permeable":

> [T]here's just air in-between. [...] I am just not focused on this person. [I am] [f]ocusing on the feeling of this, this arousal. [...] [B]efore sex, these force lines are almost more mouth-mouth, eyes-eyes. [...] [Y]ou are more connected, but at the same time, this person is absent [...] [I]t still feels as if the person [...] is not quite as different from the space between you. [...] [T]his space and the person are more alike [...][Whereas now] there isn't this density in the space between you and because of that, the partner is much more [pause] concretely there, in an object-like way. [T]here is a pretty clear distinction between me, space, and him. (AEP-06-02-03)

Continuum Between Permeance and Solidity

The areas of relative "solidity" do not necessarily map onto the objective structure of objects. Specifically, in the visual modality, the edges of objects typically appear crisp, while in "lived space," the borders of objects are fluid and subject to change. Areas of "solidity" are experienced as if displacing "permeance" and being surrounded by areas of relatively lesser "solidity," rather than purely empty space. It is through this area of middling "solidity" that an individual's grasping hand conforms to the shape of a given object. In the following aside, Participant 12 observes the experience of a wall:

> I can feel it as a solid plane. [Pause] And it's not visual in the slightest. [...] I can feel it as a tension in space between me and the wall. Where [brings his hand closer to the wall] until about here [comes nearest to the wall with his hand], there's this aura-like tension [...] [t]hat is right now guiding the spread of my fingers where I touch with my hand. (AEP-12-02-03)

This halo of "solidity," however, does not appear only in bodily interactions with objects. Spatiality and temporality seem to collapse onto a single experiential domain. Thus, areas of relatively greater "solidity" can denote an awareness of where certain objects were

located earlier. Participant 7 was lying in bed and turned off the light. She had been looking at a wooden beam, and its awareness stayed after she could no longer see it:

> It was just a feeling that I know precisely where what is. [...] It was really, really dark dark. I couldn't see any contours. [...] And yet, there was a clear, kind of like a copy. [...] Of the external space. Without me actually seeing what is there. But it is just a feeling that I know what it is. Mm [pause] and I am precisely aware of the dimensions of space [...] All that is left is a silhouette or an echo of how it was. [...] A frame of space that is fading away. (AEP-07-02-03)

Participant 7 confirmed in a follow-up question that "frame of space" corresponds to an experience of "solidity" as constructed within this study. Further, Participant 6 describes how "solidity" is associated with anticipation. She was engaged in the expectation of touches between herself and the body of her partner. She describes how this anticipation took the form of "solidity":

> [M]y experience of [my] lips was almost related [...] with my experience of his lips. There was already this connection. [...] I think my visual perception was almost thicker or this part was more accentuated [pause] this space between the bodies. [...] Like this part of space had different consistency than the rest of the room [...] (AEP-06-01-01)

> I think this space was like a thing between us that led [...] my face to their face. [...] [I]n experience, it was as if there were, like, force lines or rails. (AEP-06-01-03)

The experience of one's own body being continuous with the environment, rather than sharply delineated, was commonly reported. Participant 5 engaged in psychonautic exploration of her consciousness with her partner. On a preset evening, they had taken a dose of LSD. Throughout the evening, she entertained the idea that they were sharing each other's thoughts. This belief obtained a sensuous component when they hugged, and the "solidity" of their bodies disappeared:

> Everything was together […] *Blob* is perhaps the best word. […] For some time, I was no longer even aware that it is us on the floor there in the room, but it felt as if we are in the entire room. […] I was no longer a separate body with its own point of view, but I was everywhere in the room and together as one with him. (AEP-05-01-02)

A similar kind of bodily dispersion was reported by Participant 3. During an evening of heightened affect, she held hands with a new friend. She experienced her hand merging with his (AEP-03-02-02).

Constructed Presence

In the previous subsection, we demonstrated that while visually, objects may appear delineated, spatially, they continue beyond their borders into areas of relatively smaller "solidity." These more "permeable" fields surrounding objects may denote where the objects or parts of objects were in the previous moment, and where they might be in the subsequent moment. This field of lesser "solidity" also serves to guide bodily engagement with the objects.

In the previous subsections, however, real-world objects were present. In this subsection, we show how "solidity" can be altogether constructed in absence of a real-world object.

In experiences appraised as negative, "solidities" can preclude access to social space. Participant 7 reports a difficult sexual situation during which she attempted to communicate with the other person:

> I want to say it, but then I crash into a wall […] I can pretty much perceive [the wall] actually. […] As if there is something located around me [...] I think that what I am perceiving is like an obstacle in the physical space in which I am. (AEP-07-01-01)

Participant 14, suffering from mood disorder, entertained the idea that while she was writing her undergraduate thesis, her professor was able to read her mind. Initially, she was aware of a vector in space that connected them. Later, however, this vector turned into a weight pressing down on her:

> I first hid under the desk. [...] This tension in the room had some sort of logic that followed the laws of physics. If I lie down in that moment, this tension gets smaller. The pressure on me gets smaller. The room pushing on me gets smaller. (AEP-14-01-01).

> If I am under the desk, it protects me from the pressure of the furniture. (AEP-14-01-03)

The previous two examples demonstrate two aspects of "solidities." First, even though, in retrospect, both participants acknowledge that these barriers and forces did not objectively exist, they did preclude some and necessitated other bodily actions. Second, "solidities" seem to interact with objectively existing space. What is more, "solidities" themselves can constitute hallucinations. Participant 9, for example, reports the following hallucinatory experience:

> I was on the floor, looking at the stairs […] I didn't see anything. But I felt how from the stairs … You know in extreme heat, how the air shimmers. Like over a flame? […] [A] tiger's head made out of that shimmery stuff came out of the granite of the stairs. And kind of lunged in my face. (AEP-09-01-02)

Similarly, Participant 8, diagnosed with acute psychotic disorder, reports several instances of a sense of presence beyond her field of vision. In one case, she is aware of "ghosts" of her friends coming to haunt her in the night. In another, she is aware of the presence of some ominous person behind a locked door. In both cases, the awareness of others beyond her field of vision takes the form of "solidity." In the case of the ghosts, she reports:

> [I]t felt like I could feel the bit of space around me, like the density of the air or something. And it somehow got a bit more tighter. Like, [pause] my, you know you have kind of like a sensual [...] field around you. That is very sensitive. But it is actually how you can feel a presence if somebody is standing behind you. [...] That is what I felt. Like something was coming close to me. Almost touching me, but not really touching me. (AEP-08-03-01)

Further, Participant 8 had been hospitalized. When she returned home, she cast the hospital bracelet on the floor. There, it demarcated a border that was impossible to cross even considering the need to urinate:

> I was deadly afraid of this ribbon. And I couldn't even [laughs] I couldn't even cross the ribbon. In my mind, it drew a line through the hallway, and I couldn't step over the line. And so, I had to walk around the room into a different room, and another room to enter the bathroom. (AEP-08-02-02)

Presenting

So far, we discussed the "structure of lived space" in its passive dimension. In this section, we explore "presenting"; that is, how individuals themselves can influence their experience of presence. "Presenting" contains two subcategories: "making present and making absent." The former refers to an individual's capacity to willingly construct a sense of presence. This is typically done by attending to some region of space as if something (or someone) is there. Participant 14 commonly contended with adversities by constructing the presence of her favorite thinker:

> I didn't see him visually [...] He was like some sort of ghost, like. From this picture [of him I had over my desk], except he wasn't completely static. [...] Like, I invest some [...] effort or energy into creating this presence. [...] My experience of the whole room changes. He is now there with me. He has some force, some shape. And the room feels different. It actually feels as if it is more occupied. As if there are two of us there now. And there are fewer cubic meters available per person. (AEP-14-02-01)

*"*Presenting," however, need not be associated with psychopathologies. Participant 6, for instance, constructed a sense of presence during sexual intercourse to increase arousal:

> [b]y [pause] imagining that having a visual perspective on it. [...] He is sitting. It is as if he had a chair [pause] placed about a meter away from the bed and directed towards the bed. [...] I think it was actually a male perspective. [...] It was a male watching. (AEP-06-02-02)

Finally, the inverse is possible as well. While "making present" is primarily associated with projecting "solidity" in space, "making absent" is done by projecting "permeance" between the self and the world. This was done by Participant 7 to make a difficult sexual situation more bearable:

> As if I took the self in my mind [...] and cover her with layers of invisible defense. [...] I really start to almost completely lose touch with being somewhere in a room. [...] I feel physically dragged away. There's a distance. That I perceive between us in this moment. Physical. Pretty demarcated (AEP-07-01-03)

Generalized Solidities and Permeances

"Generalized structure of lived space" refers to an overall sense of "solidities" and "permeances" that make up an entire room or place as it is present to an experiencing

individual. "Generalized structure of lived space" consists of a spectrum between "vicinity" and "distance." Vicinity refers to the egocentric space encompassing the area that consists of one's own body and the immediate surroundings. In the "distance," individuals typically experience the world in general, as it extends to the horizon and beyond.

Consider Participant 1. She is lying in her bed, reading a book. In the "vicinity," she is aware of a sphere of space containing her head, the book, and the space between them:

> [T]here was just this kind of very small awareness, like, a small bubble from my face to the book kind of, and it was the atmosphere of what I was reading [...] In the rest of my body, it's like I don't really feel like I am there. But it's more relevant than the rest of the space around me. [...] While the rest of the environment around me is [...] undistinguishable. (AEP-01-03-01)

In the middle distance, Participant 1 is aware of the room, her desk, and her phone, as she is expecting messages:

> [T]here's the awareness of how this room [...] is kind of arranged [...] But there's [an] awareness of [...] I had my phone on my left. [...] And it wasn't in the bubble. [...] There was this understanding of [...] *that's where my world goes.* (AEP-01-03-01)

Eventually, Participant 1 hears a sound, which expands her awareness further, to an awareness of the entire situation:

> I hear the wind [...] It is as if this sound kind of pulls me out [...] It reconnects me, kind of, with with reality. [...] It has something to do with the borders of things. [...] When I am more in my bubble, let's say, everything is a bit more blurry, while here, it's a bit more defined. (AEP-01-03-01)

In "vicinity" and "distance as concreteness," the presence of objects is experienced as transmodal, that is, as a sense of "solidity." However, further towards "distance," the more abstract and amodal objects become (distance as abstraction). Participant 6 reports a sense of "density" and "thickness" between herself and the body of her partner in the "vicinity." However, this sense of "solidity" in the "vicinity" was in constant interplay with a sense of "dispersion." That is, she was able to attend to the space of the entire house, whereby the rest of the house became more transmodally present to her, and the space between the two bodies less so:

> [T]here is also the possibility that my experience of, I don't know, space was broader as it was in that situation. [...] I could be aware of the whole house, and the location of this bed inside of the house. Not in that specific way. And that somebody else is in the house as well. (AEP-06-01-01)

Note, however, that this awareness remained potential, rather than actual. Specifically, her awareness of there being somebody else in the house was experienced:

> [p]retty abstractly. Like, erm, in my head. Not like I would think about it a lot, where this roommate is relative to the position of my body or whatever. It is just an abstract image of somebody being nearby that has ears. (AEP-06-01-03)

One of the central discoveries of this study is that it is through alterations of "generalized structure of lived space" that individuals may experience "hidden worlds." Participant 9, diagnosed with a mood disorder with psychotic episodes suffered a psychotic episode following acute stress. He was with another person who, attempting to ground him, recorded him talking about the experience of a hidden world: "I think what I am imagining is more real than this. [...] I think I am [on the street in the Autonomous Zone]. [...] Under the *tower* [an art installation, appearing as a kind of scaffolding around a tree]." He responds to the query of what he is afraid of by saying: "Of not knowing where I am." (AEP-09-01-01) In an interview on this experience, the participant reports:

> I would shift [with spatial attention] to this other space that is so much wider and open. And part of why I felt that was the reality was because in this openness, I was aware of stuff behind me. I was aware of space all around. (AEP-09-01-04)

In the experience reported above, Participant 1 was abroad, reading. The awareness of the wind outside of her room made her aware of the presence of her hometown, and of the felt presence of her mother:

> Well, there's the atmosphere of that room [in my hometown]. There's the wind coming from the left, and, pretty sure there's a sort of indistinguished [sic] presence of my mom, somehow on my right. [...] [I]t's as if the pressure on my body is different on the left and on the right. On the left, there's kind of a straight surface, or, like, there's more pressure and it's straight. [...] [W]hile on the right, erm, [pause] Even though I'm not focused there, like, I'm not closed to it. It's as if there's an openness to it. And it's softer. (AEP-01-03-03)

> Open in the sense that, erm, I can expect something to come from there. (AEP-01-03-04)

A similar experience was observed when Participant 1 had taken psilocybin at a party. This led to her awareness of an "underlying reality":

> [I]t is as if this dimension where I am has a different depth than these environments in which I am, in which these laughters are. [...] So, it really feels like it is a different dimension. [...] It's as if in this space, erm, [pause] sounds will resonate in a way. It feels as if it is a void and sounds will resonate. (AEP-01-01-03)

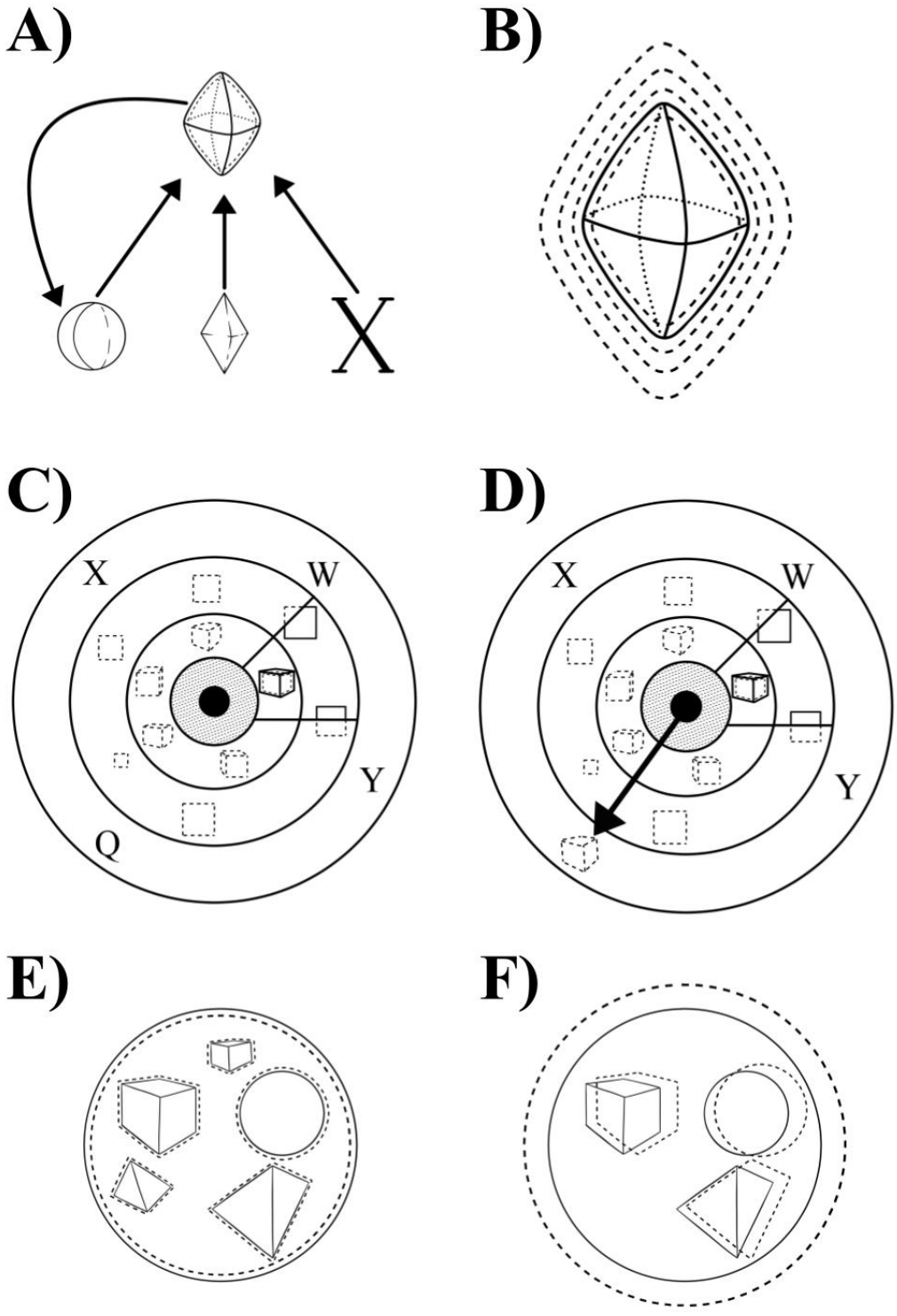
Finally, comparably to "presenting" in the case of "localized structure of lived space," it is possible to willfully construct a sense of overall topology of the room. Participant 12 was video conferencing with his partner at the very beginning of their relationship. Unable to visit her due to pandemic restrictions, he describes how he imagined being with her:

> [B]ehind me, there would be her bed. It wasn't a static feeling. It's a feeling that got stronger. The more burnt out the real stuff got, the more the atmosphere felt real. The more the spatial arrangement behind me felt real. And at some point, this feeling in my back, what becomes present in, in space, this pull towards a thing, and this thing would be her and her body. (AEP-12-02-04)

Discussion

We presented qualitative data that suggest that one of the ways in which presence constitutes itself to consciousness is through a particular organization of lived space, namely, an interplay between solidities and permeances. Figure 2 summarizes our main findings. Shapes with solid outlines represent information present in sensory modalities.

Figure 2
Summary of Key Findings



Shapes with dotted outlines represent the structure of lived space. (a) Solidity is a transmodal experience. It is constructed from all available sensory modalities and conceptual knowledge (represented by the sphere, the diamond, and the X). However, solidity itself is present in a spatial sense that is emergent on sensory experience. Solidity works top-down to organize incoming sensory experience. (b) Solidity does not overlap with objective materiality. Objects are surrounded by an area of relatively smaller solidity indicating (i) location of where the object has likely been; (ii) location of where the object likely will be; and (iii) the trajectory of bodily engagement with the object. (c) The world around the experiencing individuals (represented by the black dot) organizes itself into vicinity and distance. In the immediate vicinity lies the peripersonal space. Crosshatching represents the structure of lived space indicating the possibilities of movement. Within distance as concreteness, objects are present with their solidity even in absence of immediate sensory information. Within solidity as abstraction (represented by Q, X, Y, and W) objects are present as amodal knowledge. (d) Objects in distance as abstraction can be attended to and made present as transmodal. (e) In normative experience, generalized structure of lived space contains objects whose sensory experience overlaps with their spatial experience. (f) In some non-normative experiences, generalized structure of lived space contains objects whose sensory experience does not overlap with their spatial experience.

Presence As the Experience of Spatial Solidity

"Solidities" are perceived as densities in space (i.e., they are perceived beyond one's body), or in Sartre's (2018, p. 435, emphasis in the original) words: "we perceive the resistance of things." This notion is in line with Husserl (1997) who argues that presence is firstly experienced as an empty spatial topology, which is only secondarily filled with sensory content. Sartre's (2018, p. 376) idea that "the object-in-the-world can be only probable" is also compatible with our findings. As we have demonstrated in Subsection 3.2., objects - although visually crisp - are not spatially clearly delineated. Rather, they are surrounded by a halo of relatively lesser density, indicating where the object has been in the prior moment, and where it is likely to be in the coming moment. In this way, "solidities" and "permeances" constitute not only spatial, but temporal organization of objects as well (cf., Ratcliffe, 2015). Phenomenological studies of working memory have observed a similar aspect of experience (Oblak, 2020; Oblak et al., 2022). What they term "impression" refers to a non-visual, spatially felt sense of a stimulus "having been there." This sense has been related to Sartre's (2010) observations in *The Imaginary:*

> [The trajectory of my index finger] naturally appears as a static form; it is given as the path traversed by my finger and, more vaguely, beyond its current position, as the *path* still to be traversed. The path traversed – or a part of that path – is presented moreover as a vague luminous trail. (Sartre, 2010, 75-76, emphasis in the original)

These findings are further in line with David Abram's (1996) ethnographic analysis of embodied temporality, wherein he observes that time and space, in lived experience, collapse onto a single experiential domain (i.e., spatiotemporality).

"Structure of lived space," that is, the interplay between "permeance" and "solidity," does not amount to discrete states. Through areas of relatively greater or smaller "solidity," the lived body (*Leib*) is in direct contact with the world. This corresponds to the idea of "body schema," wherein we can see that the lived body extends beyond the borders of the body as

object (*Körper*), constituting "lived space" (cf., Merleau-Ponty, 2012). This dynamic is explicitly reported on in the data:

> I changed my posture. According to this aura that I suddenly felt, which might have been mine. [...] I felt I am taller than I actually am, and I kind of felt out of my body also. Like I am extending. I can feel more space around me. Something of me is extending. (AEP-08-01-01)

As we have demonstrated in the Subsections 3.1 and 3.2, the experience of one's lived body extending beyond itself is particularly salient in the experience of intersubjective space (i.e., space between two individuals), also referred to as "intercorporeality". Fuchs (2016) writes that the lived body always transcends itself and connects with the environment. This is the case for example in every skilful handling of instruments [...] In such cases, the instrument is integrated into the body motor schema like an extension of the body, subjectively felt as "melting" or being at one with the instrument. However, such incorporation also occurs with other people, even at a distance.

Finally, the very idea of presence being a matter of degree is related to the notion of "phenomenality." J. Kevin O'Reagan et al. (2005) propose that objects may be present to us depending on (a) the amount of sensory detail their exploration affords, and (b) to what extent we are able to interact with them with our bodies.

Structure of Lived Space as Transmodal

The idea that the available content combines to form a transmodal (i.e., combined from other but present in a novel modality) sense of space can be traced to Hall (1966). He reports on how animals exist in several "sensory worlds," each corresponding to an understanding of the environment offered by a specific sensory modality. These then integrate into a sense of space, evolutionarily related to behavioral patterns of territoriality, spacing, escape distance, etc. Hall (1966, p. 181) writes that human "sense of space is a synthesis of many sensory inputs: visual, auditory, kinesthetic, olfactory, and thermal." This synthesis corresponds to the notion of "synaesthesia" in Merleau-Ponty's (2012, p. 238) thought:

> [E]ach color in its inmost possession is but the inner structure of the thing manifested on the outside. [...] By opening up to the structure of the thing, the senses communicate among themselves. We see the rigidity and the fragility of the glass and, when it breaks with a crystal-clear sound, this sound is borne by the visible glass. [...] The form of objects is not their geometrical shape: the form has a certain relation with their very nature, and it speaks to all of our senses at the same time as it speaks to vision.

In the study of experience, the term "transmodal" originates in Claire Petitmengin's (2007) studies on the source of thoughts. There, transmodality refers to thoughts being translatable from one modality into another. In adopting this term, we also maintain this conceptualization, since – as evident by the reports in Subsection 3.1. – the sensory modalities that synthesize into the "structure of lived space" are retrievable in reflection (i.e., participants can report on which sensory modalities integrate into the novel spatial sense in each experiential episode).

Thus, a circular cognitive mechanism can be proposed in which novel sensory content as well as representations in working memory integrate to form a sense of the spatial topology of the object. This spatial topology subsequently works to organize incoming sensory

information. The latter idea is substantiated in our data by instances where the subsequent organizing of sensations fails. In three cases, participants had all taken psychedelic drugs (psilocybin or 2C-B), and they experienced modal experience pouring over the spatial boundaries of objects:

> [D]irectly where the two bushes came together, they were in contact along the whole side, which was about two meters long. And in only one specific spot, it seemed to me as if there was a circular area, about 30 centimeters in diameter, where [pause] suddenly, in that moment, colors began to crawl together. They began to pour into each other and mix with each other. (AEP-11-01-01)

We propose that this integrated spatial topology subsequently operates in a top-down manner via "cognitive projection." On David Kirsh's (2009) view, projection allows cognitive agents to augment what is immediately present in their perception with what could "possibly" be present. Cognitive projection requires real-world objects upon which probabilities are bootstrapped. A telling example of this dynamic is provided by Gaston Bachelard (2014, p. 156) in *The Poetics of Space* with his phenomenological account of corners: "An imaginary room rises around our bodies, which think that they are well hidden when we take refuge in a corner." In three sampled experiences (AEP-09-05, AEP-09-06, and AEP-14-01) we can observe precisely this dynamic. Participants, both suffering from mood disorders, experienced the world as threatening during a panic attack. They perceived danger as a sense of weight pressing down on them. In two cases, they found refuge from this pressure under a table, and in one in a corner on the street.

Our findings, however, only partially correspond to this conceptualization. Normative experience amounts to a so-called "blended space" (Malafouris, 2016) in which "solidities" of real-world objects interact with imaginary "solidities." In Subsections 3.3. and 3.5., however, we further demonstrated how, in lived experience, "solidities" in absence of real-world objects, or a sense of "solidity" that does not correspond with the world as made present by modal senses can be seen as phenomenological correlates of hallucinations, as well as delusional belief that one is in touch with a hidden reality (cf., Parnas & Sass, 2002). These findings may shed further light on how bottom-up experience (i.e., a change in sensations as opposed to beliefs) supports or even cause the formation of delusions (cf., Hohwy, 2004).

The Experience of Distance

Finally, we observed a particular interplay of "solidities" and "permeances" that changes relative to the distance from the experiencing person's body. "Generalized structure of lived space" describes a continuum between "distance" and "vicinity." At the center of vicinity lies the space that is occupied by the body of the experiencing individual. The egocentric space refers to a sphere of space within which the individual can interact bodily with the world around her. While in the vicinity, objects appear as transmodally present, in the "distance," they are only available modally (e.g., seeing a mountain in the distance) or as abstract, amodal knowledge (e.g., knowing that there is a foreign country beyond a hill). We can relate this to Hall (1966), who writes that living beings are surrounded by a series of concentric circles. He primarily ties them to different distances from an animal being conducive to different types of interactions. Hall outlines four distances: "intimate," "personal," "social," and "public." These are related to both specific affordances and available sensory information. At an intimate distance, for example, the other person is visually distorted, and she is primarily present through proximal senses (smell, touch). Conversely, at a public distance, visual objects

appear two-dimensional, and we may have to aid ourselves with conceptual knowledge in parsing the scene.

"Generalized structure of lived space" corresponds to the idea of core-world (*Kernwelt*) in Husserlian thought. According to Edward S. Casey's (1998) exegesis of Husserl's manuscripts, our lived world consists of the near sphere (*Nahsphäre*; inhabiting objects and places that we can approach and interact with). Casey parallels the near sphere with Heidegger's notion of *die Nähe* (the near), which contains objects that offer affordances and obduracies; that is, enabling some and precluding other bodily interactions (Laughlin & Throop, 2006). Conversely, the far-sphere (*Fernsphäre*) refers to the part of the world that we cannot immediately reach.

In Oblak, Boyadzhieva, and Bon (2021a), we conceptualize presence as transmodal in an explicit opposition to Noë, who conceives of it as amodal. This move has been questioned (for an exchange on this issue, see Lukitsch, 2021; Oblak et al., 2021b). The present study, with its broader investigation of "lived space," offers a way of resolving the debate on the amodal/transmodal nature of presence by synthesizing different views.

While the normative experience of "vicinity" and "distance" corresponds to the view put forward by Husserl (1997) and Hall (1966) (i.e., we are surrounded by spatially delineated spheres that offer different affordances and modal information), our data suggest that these spatial spheres are not immutable. In Subsection 3.5., we have demonstrated how the sense of spatial organization can be changed in certain psychopathologies and psychedelic experiences, leading to a sense of being in contact with a hidden, underlying reality. However, we also provided two examples (AEP-01-03 and AEP-12-02) where this spatial dynamic was altered, once serendipitously and once willingly.

In *Varieties of Presence,* Noë (2012, p. 26) evokes an example of his friend Dominic, residing in Berlin. Noë, writing his book, presumably in Berkley, can bring Dominic to mind:

> I don't mean *that* Dominic is in Berlin. I mean something else. When I think of Dominic this way, he shows up for me in my thinking; he has a certain presence; he is present to mind. Not that he *is* present. He's in Berlin. And not that it seems to me as if he is somehow here. He is present to my thoughts, now, but not as *here;* my sense of his presence such as it is, is a sense of his presence as far away, *there,* in Berlin.

Noë (2012., p. 10) emphasizes that "we achieve presence. We act it out." In this way, we can synthesize these disparate accounts of presence, and claim that in the far-sphere, presence is by default (a)modal. In the middle distance, our sensory system offers a sparse (in the case of vision, two-dimensional) account of the scene. Conversely, in the near-sphere, presence is by default transmodal (i.e., objects appear as holistic, three-dimensional spatial organizations). However, we may attend to the far-sphere (whether it be modally accessible to us, such as distant objects, or relegated beyond the horizon, such as a foreign country) and construct a sense of transmodal presence there. In other words, the abstract, amodal knowledge can be attended to, which subsequently transforms it into a (trans)modally present experience (the same dynamic has been observed in the experience of the enaction of beliefs; Klauser, 2021b; for an English summary, see Klauser, 2021a).

Conclusion

In this study we have explored the relationship between presence and lived space using subjective reports from experiences sampled from positive (e.g., psychonautic experiences, sexual intimacy) to negative episodes (psychopathologies, emotional stress). A significant

limitation of this study is that when gathering data on specific psychopathologies, participants may experience intense emotional reactions, limiting the scope of data acquisition.

We reached three conclusions in the study. Presence, as constituted by lived space, is a transmodal experience. While dependent on all available sensory information, it is present in a novel modality, experienced as a sense of density in space. This density does not overlap with objectively existing materiality. Rather, it also indicates the probability of where some object has been or will be. Second, "solidities" may suggest a different spatial organization of a place than modal information, such as sight. This decoherence may underlie certain delusions. Finally, our data suggest that distant space can appear to consciousness in two capacities: "distance as abstraction" and "distance as concreteness." Specific mental acts may transform the former into the latter. This observation can resolve a standing debate in the literature on whether presence is amodal or transmodal: it may be both.

Our findings are significant as they (a) may contribute to the development of transdiagnostic phenomenology-inspired models of alterations of the experience of presence and lived space (both in psychiatric disorders, as well as positive states, such as mystical experiences); and (b) allow for precise neurophenomenological studies of presence to be developed, leading to non-reductionist enactivist models of this phenomenon.

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psihoterapija [*Meanders of the Soul: Ancient Philosophy and Psychotherapy*] (with J. Ciglenečki), Ljubljana: KUD Logos: Inštitut za študije meništva in kontemplativne znanosti, 2022.

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Acknowledgements: The authors wish to thank Sinja Miloševič for her help with preparing the manuscript.

Article Citation

Oblak, A., Boyadzhieva, A., Caporusso, J., Škodlar, B., & Bon, J. (2022). How things take up space: A constructivist grounded theory of presence and lived space. *The Qualitative Report, 27*(11), 2556-2582. https://doi.org/10.46743/2160-3715/2022.5762