

New Phenomenology as Perspective for HRI

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Abstract—In the context of care, robots are confronted with a double extreme situation: First, a particularly high degree of humaneness and empathy is insinuated for care situations, i.e. high interaction demands are made; second, the physical and bodily perceived closeness and intimate interaction represent a new form of togetherness of humans and robots. Such situations bring social scientists to the scene, who deal with the empirical and theoretical research of social behavior. It is difficult to treat robots with classical sociological theories since these presuppose subjects or actors for an interaction. However, addressing human-robot interaction in care contexts and in general is possible from the perspective of Hermann Schmitz' *New Phenomenology* and through empirical investigation, as I suggest with this paper.

Keywords—Care, critical robotics, Hermann Schmitz, human-robot interaction, *New Phenomenology*, social science

I. CARE ROBOTS REQUIRE NEW PERSPECTIVES

In times of demographic change and the accompanying 'care crisis' as well as a general (also institutionally supported) mechanization and algorithmization of society, social robots are increasingly conceptualized and realized especially for care contexts. Interactive toy robots take over childcare and education tasks [24], partner robots give love and comfort [19], and nursing robots take care of the elderly and ill [16]. The context of care confronts the interaction ability of robots with a double extreme situation: First, a particularly high degree of humaneness and empathy is insinuated for care situations, i.e. high interaction demands are made; second, the physical and bodily perceived closeness and intimate interaction represent a new form of togetherness of humans and robots.

Such situations, in which robots interact with humans and thus intervene in human societies, bring social scientists to the scene, who deal with the empirical and theoretical research of social behavior. It is difficult to approach social robots with classical sociological theories since these presuppose subjects or actors for an interaction. However, addressing human-robot interaction in care contexts and in general is possible from the perspective of Hermann Schmitz' *New Phenomenology* and through empirical investigation, as I will suggest in the following. The possible applications here are not of interest to the social sciences alone, but can also find inter- or transdisciplinary use, as they can develop a versatile vocabulary and spill over into other disciplines in the field of HRI.

First, a brief overview of the limitations of sociological theory for human-robot interaction is given (II). Whereupon, in turn, empirical research is presented suggesting that transhuman interactions do exist (III). Subsequently, it is presented how the *New Phenomenology* is able to investigate interactions between humans and robots by focusing on precognitive corporeality (IV). Based on this, suggestions for a methodological application in HRI are offered and an outlook is given (V).

II. LIMITS OF SOCIOLOGICAL INTERACTION THEORIES FOR HRI

The technical origins of HCI focus on the ergonomic fit between humans and machines. Later, the information exchange between brain and computer is added, and during the development of advanced interaction possibilities social scientists successively enter the field of HCI, as also described by the *Three Paradigms of HCI* [14]. Similarly, *Critical Robotics* proposes a new paradigm for HRI [31]. With sociological theories, interaction perspectives are changing. But so far they often remain limited in applicability, as classical sociological theories of interaction do not allow social robots to be included since they lack the appropriate status as subjects or actors.

Sociological studies, which can be placed in the third paradigm, often deal with the sociability of robots and emphasize that those only obtain their sociability through the intervention of their human counterparts. People present enact the robots through situated interactional work [1] or robots are, in order to be perceived as social actors, already animated in development through elaborate classification and embedding work as well as staging practices by the developers and engineers [5].

This turn to questions of subject or actor status in sociological analyses of social robotics is grounded in the perspectives of sociological theories of interaction that presuppose such a status. Berger and Luckmann, for example, emphasize that interaction is the fundamental experience of other persons [4], and Goffman's notion of interaction also assumes a physical encounter between two subjects [10]. Luhmann's *systems theory*, by emphasizing the selection of information, presupposes consciousness systems that are mostly interpreted as human [23], although recent systems theory considerations attempt to include algorithms [2]. *Actor Network Theory* [18] includes the possibility of non-human actors, but focuses particularly on networks and their exchanges, rather than on the interaction itself.

III. INDICATIONS OF BODILY INTERACTION WITH CARE ROBOTS

Studies on robots in care contexts empirically show that forms of interaction take place that go beyond the engagement of humans with objects and include bodily components such as closeness and benevolence. Smart toys tell bedtime stories, teach languages, and promise to perform caregiving and parenting tasks such as encouragement for brushing the teeth in the evening. Sherry Turkle describes a generation of children and adolescents who are surrounded by interactive toys that portray emotion and affection and, in turn, demand care [33]. Children model themselves on play robots and adapt to their phrasing and demeanors. Furthermore, children tend to mimic the expressions and behaviors of their smart toys in terms of content [24]. Smart toys are therefore also described as a hybrid ontological category between the animate and the inanimate, as they are perceived as social beings [36].

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The discourse around partner robots illustrates the focus on the actor status with its accompanying ethical and legal issues, as the different designation of the topic already shows: on the one hand, the focus is on ‘sex robots’ with object character [32], on the other hand, the concept of *Lovotics* talks about partnership-based ‘love robots’ [25]. On the one hand, sex robots are portrayed as serving and passive ‘popular human activity’ for sex therapy, prostitution, and sex fun [19], Richardson, criticizes Levy’s comparison of prostitution: “Levy shows that the sellers of sex are seen by the buyers of sex as things and not recognized as human subjects” [26]. Considerations about using partner robots in sex care for people with impairments or elders [8] underscore the difficulties of a clear subject-object distinction as well as the challenging intersections around corporeality, care, and interaction that arise for social robots in care. In care situations, robots are conceived as substitutes for human interaction partners, but this is obscured and relativized from a technical perspective, as it is evident in the case of nursing robots.

Nursing robots are designed to support or replace human caregivers, to hand out medications or meals, to help with ambulation, or to alert emergency services. They are preferred by humans over human caregivers for intimate care, for example, but are described as unsuitable for other activities, especially social ones [3]. The societal need for robotics in care is justified by demographic change and the accompanying ‘care crisis’. Here, robots promise technical solutions, but without yet fulfilling them or being in particular demand by caregivers and those in need of care [16]. The prominent example of PARO, a robotic seal that has been used in animal-assisted therapy since 2003, shows that most of the studies in this regard have focused less on the cared-for and the interaction, but rather on the researchers and the technical functions of the robot [17]. Structurally, Bischof emphasizes, robotics in nursing is enabled by the institutionalization and streamlined routines of care practice that facilitate the use of technology. At the same time, the implementation work is hardly focused on the needs of the people to be cared for [6].

Despite the cited apparent unsuitability for social activities, people in need of care come into close, sometimes intimate contact with nursing robots, in which forms of social interaction are unavoidable. The view of care robots as technical objects and the exclusion of bodily interactions obscures the view of important follow-up questions.

IV. SCHMITZ’ NEW PHENOMENOLOGY AND THE CONCEPT OF INCORPORATION

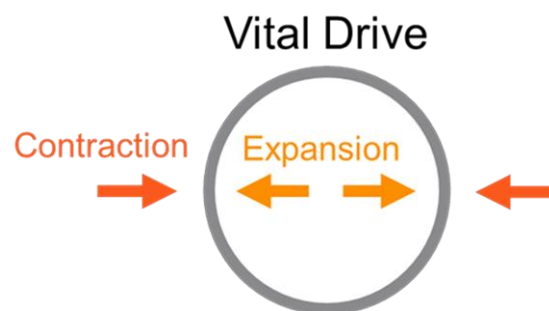
In contrast to classical sociological interaction theories, Schmitz’ New Phenomenology allows to empirically investigate bodily interactions in human-robot situations. According to Schmitz, bodily perception precedes conscious perception and thus this perspective makes it possible, among other things, to investigate interaction situations with non-conscious entities. The often obstructive question of the subject or object status of robots can be pushed into the background. The concept of *Encorporation* and the boundary between *one-sided* and *reciprocal antagonistic Encorporation* are highlighted as central for the analysis of interaction situations.

A. Schmitz’ New Phenomenology of the Felt Body

Phenomenology is the philosophical study of structures of experience and consciousness. It aims to create conditions for the objective study of topics that are usually regarded as subjective such as the mind and experiences like perceptions and emotions. Consciousness is thereby not studied from the perspective of clinical psychology or neurology but through systematic reflection to determine the essential properties and structures of experience in a specific situation.

While in the classical phenomenology of Husserl, consciousness and intentionality are the starting point of the investigation, for the German philosopher Hermann Schmitz it is the *Affective Involvement* (affektives Betroffensein) of the *Felt Body* [30]. In the New Phenomenology formulated by Schmitz, the Felt or Lived Body (Leib) is what one senses about oneself “without relying on the testimony of the five senses (sight, hearing, touch, smell, taste) [...]” [28]. In contrast, the material-anatomic physical body is what one sees or feels of oneself, that is, what one perceives sensually. The Felt Body, however, is not another thing, as the physical body is, but rather describes the state, the *Impulses of the Felt Body* (Leibliche Regungen).

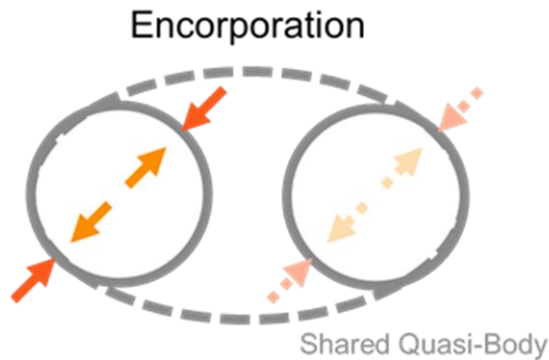
The perception of these impulses can be described with a comprehensive vocabulary and ranges between the extremes of *Contraction* (Engung) and *Expansion* (Weitung) [27]. The Contraction of the Felt Body emerges in fear or great fright, as an impulse to want to leave but being unable to do so. The Expansion emerges in moments of euphoria, intoxication, and stepping into the open. In its extreme form, Expansion would mean the dissolution of the self in vastness and is known as a kind of letting go that appears every day in the moment just before falling asleep. The constant interplay between Contraction and Expansion is what Schmitz calls *Vital Drive*. This normally leads, after one extreme over the other, back to a certain balance between Contraction and Expansion [28].



B. Encorporation

Central to the analysis of interaction with human as well as non-human entities is the concept of *Encorporation* (Einleibung). This describes situations in which bodies come into contact with other bodies or things which intervene in their own condition. Thus, a *Shared Quasi-Body* (Quasi-Leib) is created. Conversely, one could say that Encorporation occurs when one’s own body is so haunted by someone or something that one has to act upon it or is tempted to do so. In Antagonistic Encorporation, the Vital Drive is distributed among multiple partners. In this context, Antagonistic Encorporation can be one-sided, when the distribution of roles is fixed in terms of dominance and the incorporated (passive) partner is completely dependent on the other. An example of one-sided Encorporation with an

incorporeal partner is evading an imminent approaching mass such as an approaching stone. In turn, in the reciprocal form of Antagonistic Encorporation, the dominant role alternates in the shared Vital Drive. “The partners of reciprocal encorporation pass dominance to each other like a ball” [29]. Examples of this would be mutual avoidance on the sidewalk in the big city or the exchange of glances in a conversation or a flirt.



While, from this perspective, one-sided Antagonistic Encorporation obviously occurs with robots, the crucial question is whether reciprocal Antagonistic Encorporation can occur between humans and robots, and if so, what conditions are crucial for such a situation. In contrast to other interaction theories, this approach allows us to investigate exactly this boundary between the conditions of one-sided and reciprocal Antagonistic Encorporation. Thus, questions about successful interaction and its consequences can be raised.

C. Applications of the New Phenomenology

The use of this phenomenological perspective is certainly not (yet) widespread, but it is used in many disciplines, especially in German-speaking countries, such as psychotherapy, economics, or art [9] and in empirical form in the context of care [34]. The number of empirical sociological works is limited. Besides a recent contribution by Lindemann and Schünemann on bodily presence in mediated communication [22], it is especially Gugutzer who works empirically on various topics of the Felt Body [11], [12]. From a theoretical point of view, Lindemann already incorporated the New Phenomenology into her social theory at an early stage [20] and even applied it to HRI while focusing on the spatio-temporal preconditions of social agency [21]. Likewise, Henkel proposes an extension of systems theory with the New Phenomenology [15]. Michael Uzarewicz develops a neo-phenomenological sociology of the transhuman that reads as a critique of the described subjectivity focus of classical sociology [35]. Gugutzer outlines the program of neo-phenomenological sociology [13], which has been applied by him and myself [7].

V. METHODOLOGICAL OPTIONS AND CONCLUSION

As it turned out, Schmitz' New Phenomenology can close the gap that classical sociological interaction theories leave open. It allows to empirically investigate the bodily interactions in human-robot situations, while the often limiting question of the subject or object status of robots fades into the background. As central categories of analysis, human-robot interaction can be investigated with the concept

of Encorporation and especially at the boundary between one-sided and reciprocal Antagonistic Encorporation.

This distinction can be investigated using different methods of qualitative social research: Interviews or diary recordings can be made during or directly after interaction situations. In particular, artistically inspired methods can be used to visualize the bodily felt experiences during or after the interaction with robots. Especially for the development of social robots an extensive vocabulary can be used to describe the sensations during the interaction. In this way, the togetherness of robots and humans can be investigated based on the phenomena that emerge and previously unasked questions can become apparent – especially in the extreme situation of care, but also for other fields of application.

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