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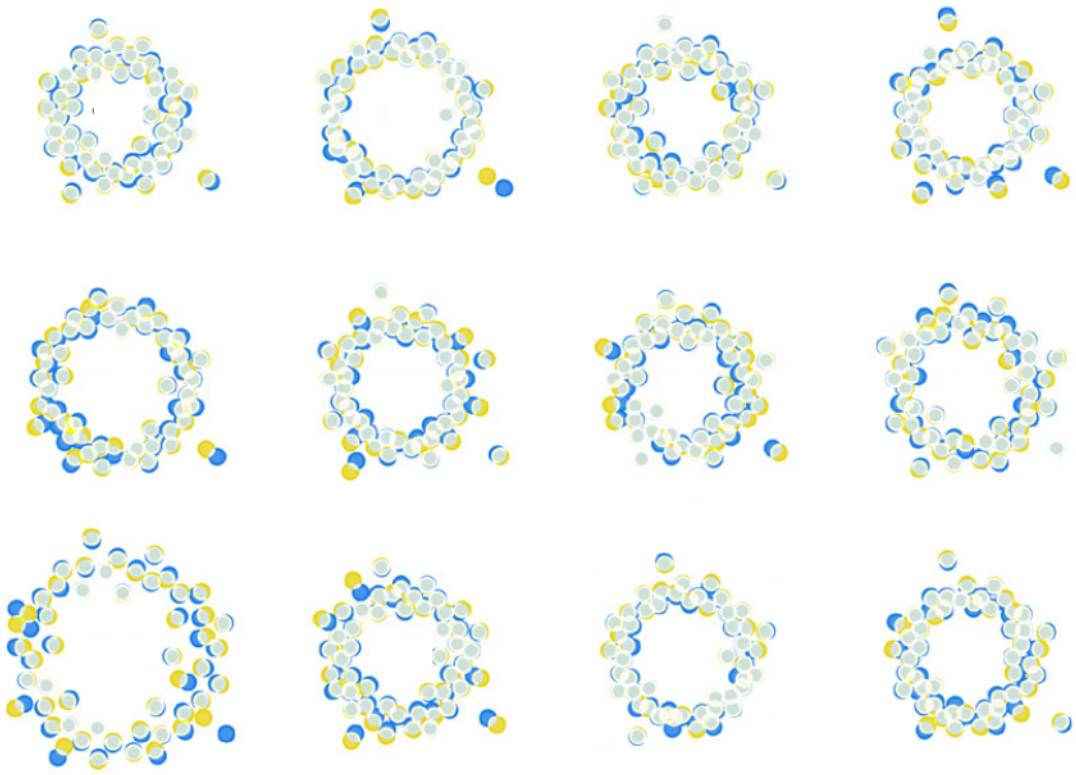

Designrama

Forum and Reviews

The *Thinginess* of Medications: Some Points of Observation From the Design Angle

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Abstract
A large number of healthcare studies are paying great attention to patients' behaviour with medicines and to patient-related factors leading to successful or poor medication adherence. In spite of that, more diffused design-oriented perspectives grafted onto the *medication-user* relationship still deserve dedicated attention. Although medicines can be the first (and sometimes only) remedy a patient can rely on when at home, there is a relative *inertia* in designerly ways of conceiving medications as designed things. Along with being respectful of the sensitive side of dealing with the *materia medica* that alleviate ill health, this paper addresses some concerns about the pragmatic use of medications at home, in order to convert them into design concerns. To this end, it takes the form of a literature review that partly revisits consolidated studies conducted in the anthropology of pharmaceuticals.

Keywords
Medications
User Centred Design
Product affordance
Design for care

The Concrete Side of Medications

By definition medicines indicate "any chemical substance or product used to modify or examine physiological functions or disease states for the benefit of the patient" (Caprino, 2011, p. 10). They may represent "any substance that determines functional changes in the body" (Caprino, 2011, p. 9). Furthermore, "the prototype of medicines are the *materia medica* that alleviate ill health" (van der Geest et al., 1996, p. 154), *materia medica* being the old-fashioned term "to remind that medicines are material things" (Reynolds Whyte et al., 2002, p. 3). More commonly, medications are conventionally intended as industrial pharmaceutical products obtained on the basis of scientific principles derived from biology, biomedicine and pharmaceutical chemistry. Not only "medicines are things" (van der Geest & Whyte, 1989, p. 345), but the sense of their attributed power is in their concreteness. As in van der Geest et al. (1996), "Their *thinginess* allow patients and healers with a means to deal with the problem at hand" (p. 154). Medicines are tangible, usable in a concrete way: by applying a medicine, "the state of a patient turns into something concrete, into something to which efforts can be addressed" (van der Geest et al., 1996, p. 155). Depending on variable points of view, medications are further defined as *things* that allow therapy to be disengaged from its social entanglements (van der Geest & Whyte, 1989), *medicinal forms* saturated with meaning (Akrich, 1995; Desclaux & Lévy, 2003) and *technical objects* (Akrich, 1996). The latter in particular indicates the product handled by the user, including the characteristics of the related devices that allow medicine intake such as dispensers, containers, integrated devices for measuring, regulation, conservation, portioning. As the significance of medicines lies in their curative efficacy, the inherent use and intake devices, although unrelated to the therapeutic efficacy of the underlying pharmacological principle, become an integral part of the therapeutic success. Therefore, any drug efficacy may depend either on its scientific principle and on the refined, sophisticated, hyper-technological, or conversely completely prosaic techniques of its consumption or delivery, modalities that relate to the nature of medicines as *things* (van der Geest & Whyte, 1989) and *technical objects* (Akrich, 1996).

As we are mainly addressing ordinary people's habits and common experiences with medications, we will refer to the expressions *medication use* or *medication management,* instead of medication adherence, patient compliance, drug administration, which mirror the terminology that clinical literature tends to use. In fact, "'adherence' and 'compliance' speak to a clinician's perspective of keeping to intake schedules, and the term 'drugs' emphasizes prescription medication" (Hirsch et al., 2000, p. 80). Conversely, to better address patients' intimate habits, lifestyles and behaviours (elderly and vulnerable people especially), we choose to more closely identify our perspective with people themselves, who are more likely to refer to drugs as *medicines* and *medications*, and to adherence as *medication management* or *medication use*.

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Observing the Home Pharmacy

Hospitals are the peculiar *loci* where medication management is usually codified, regulated, and processed through protocols. Within such contexts, it is possible to detect errors *via* deviations from the foreseen formal procedures so to trace who, where, how, and why an error has taken place (Aronson, 2009).

However, for the purposes of our reflection on the current relevance accorded to in-home care routines, we are instead focusing on in-home medication management.

Here, in particular, we are interested in reflecting upon the consistency, composition, and arrangement of the home pharmacy, largely referring to Fainzang's (2001, 2003, 2005, 2012), Akrich's (1995, 1996), and Akrich & Méadel's (2002) consistent studies.

The way the home pharmacy may be arranged often reveals recurring patterns: once the medication has been purchased, it is stored in various places following mechanisms that do not necessarily reveal a utilitarian rationale (Fainzang, 2003). The medicines may be placed together randomly, without any specific pharmacological logic. Some individuals have a drawer for medicines (or even multiple drawers for different family members). Drug storage locations include drawers, bathroom cabinets, cupboard shelves, or even the study drawers, when pharmaceuticals may be stored in an archive or among collections of important documents (Fainzang, 2003). A specific logic of organization can be expressed by the separation between medicines in use and backup ones (unused medicines, remains and leftovers of previous treatments, medications purchased in anticipation). The latter sometimes are kept in containers, cabinets, and on shelves located in auxiliary or marginal spaces outside the domestic spaces used most. This peripheral spatial location denotes the secondary function of such medications that *may be useful, sooner or later*. In this case they often expire, as people simply forget them or find it difficult to discard them.

Unlike occasional medicines, those in use can be accommodated in the kitchen (on a shelf, the buffet, a table top), in the dining room, in the bedroom (on or in the bedside table), regardless of any connection to the time of intake (Fainzang, 2003). The fact that medications can occupy a significant presence in the kitchen or in the dining room remarks on both the functional and symbolic nature of the place where medicines are stored. The temporal coincidence of medicine intake with meals obviously produces an associative effect and serves as a memory aid. Medicine in full view on the kitchen table or next to the dining seat (Palen & Aaløkke, 2006) indicates the effective importance, even mandatory, of taking that specific medication at the right time, thus reducing the risk of forgetfulness. At the same time, the kitchen plays the role of a priority social space where friends, either intimate or occasional, are hosted, and family members gather. It is the place where also other relatives, either residents or visitors, can provide informal visual supervision to ensure that the patient is managing his/her treatment in a correct way (Fainzang, 2003). Accordingly, placing medicines in the kitchen allows the family to exercise active control.

Of course, the choice of the kitchen as home pharmacy also highlights the association between medication, especially if taken by

mouth, and diet, nutrition, and food. Some medicines may even hide among foods in the kitchen scenario: this certainly is the case with syrups, food supplements, and medicines that need to be refrigerated. Such a dissimulation, which proves to *tame* pharmaceuticals by classifying them among foods or household items, on the one hand reduce their sense of extraneousness, on the other can generate undesired inadvertence.

Other types of medicines, especially if related to an intimate sphere of the body and dissociated from nutrition, are kept elsewhere, even if they are to be taken at meal times. This is why people decide to place some of their medication in the kitchen and others in their own private room, or in the bathroom, according to a ratio of separation that associates the medication with the body part concerned. Such a ratio can even defy functional logic and respond instead to the constraints the individual's sense of privacy dictates.

Observing Medication Errors Related to User Behaviour

The ambiguity of medicinal potency is evident in the derivation from the old Greek word *pharmakon,* poison*,* from which *pharmaceutical* derives. Indeed medicines can be simultaneously noxious and beneficial. Although intended as beneficial, medicines can harm accidentally and the potentially noxious effects of medicines are a key concern in the biomedical tradition (Reynolds Whyte et al., 2002).

The increase in medication errors related to user behaviour — notwithstanding an increasingly educated population — emerges from a complex of factors including:

- The general expansion of medicalization that shaped the figure of the *patient as a consumer* (Conrad, 2007; Williams et al., 2011; Gabe et al., 2015).
- The significant trends in the personalization of care. The individualized prescription, because of the specific characteristics of many medicines available today, allows appropriate adjustments with the possible consequence of imprecise dosage alteration of the pharmaceutical integrity.
- The spread of the informal digital information that contributed to the growth of the *do-it-yourself* medication practices and self care (Akrich & Méadel, 2002; Fainzang, 2003; Vicarelli, 2009; Fainzang, 2012).
- The diffusion of several forms of non-conventional or alternative medications (such as for instance phytoparmacy, homeopathy, natural remedies) that may lack either explicit dosage indications and warnings for use.
- The increase in the elderly population, which tends to be affected by multiple chronic diseases, and therefore likely to use many medicines (European Commission, 2018; Lumme-Sandt & Virtane, 2002). Not only elders are more subject to physical, cognitive, and perceptual fragility, but aging often brings deficit accumulation at problem-solving, reasoning, and decision-making levels.

As we are focusing on patient-related factors from the design angle, we are mainly considering the unsuitable characteristics of the designed properties of medications *per sè*, as well as those unfavourable contextual conditions — i.e. inadequate surrounding domestic environments, absence of dedicated care-givers, social contexts of vulnerability, isolation, weakness, debility, temporary incapacity — where, even in cases of elementary pharmacological treatments, the risks of medication error and care discomfort may be high (World Health Organization, 2003).

Investigations (Palen & Aaløkke, 2006) often report "that people manage their medications — with only partial information about what the medication is — through a set of personalized spatio-temporal arrangements and routines that they devise in their homes. These physical arrangements and routines provide a sense, structure and rhythm to intake even when people know very little about the medication itself" (p. 79).

While the growing consumption of pharmaceutical products has fueled extensive research — mainly conducted in the medical-epidemiological field — on their side effects, interactions, and the factors that may alter therapeutic properties (European Medicine Agency, 2015; 2015a), as well as on the many patient-related factors contributing to medication nonadherence, such investigations still offer considerable margins of exploration about user misbehaviour (ranging from abuse to forgetfulness, non-compliance with methods of handling, incorrect storage methods, dosage mistakes, incorrect use interpretations) conditioned by the inherent designed properties of medications. Moreover, any perceptual, physical, or cognitive difficulty induced by lack of affordance of the medicine itself can hinder or reduce access to care, causing the patient not to take the medication correctly or to discontinue therapy altogether.

Observing Medications as Social Objects

Medications are social objects: "As things they can be exchanged between social actors, they objectify meanings, they move from one meaningful setting to another. They are commodities with economic significance, and resources with political value. Above all they are potent symbols and tokens of hope for people in distress" (Reynolds Whyte et al., 2002, p. 5).

The approach of the anthropology of pharmaceuticals (van der Geest et al., 1996) to the question of medication consumption has directed researchers to trace behaviour patterns that, on the one hand, can be ascribed to different society cultural models and, on the other, testify the spread of universal practices. Whether one decides to ascribe the concept of *medications-as-social-objects* to cultural diversity or to the universality of individuals' behaviour, the use of medicines is socially constructed by symbolic logics and guided by mechanisms that may escape medical rationality in its strict sense (Fainzang, 2005). This is why the concept of daily *ritual* (Crespo et al., 2013) is integrated in our perspective. The attitude that people may show towards chronic medication intake — notwithstanding its repetitiveness and automatisms — may maintain the traits of what is out of the ordinary, of what is more than simple

replication, making a *rite* out of a routine (Denham, 2003), charged with intimate or family cultural bonds, traditions, values, and memories. If routines are operationalized as behaviour linked to daily or ordinary activities pertinent to health, rituals are better described in terms of celebrations, traditions, religious observances, with their symbolic *paraphernalia*. This may be the case when the daily dose of pills is contained in a box that bears a sacred image on the lid; or the habit of using an embroidered delicate white placemat as the surface on which the medications have to be placed; or, again, the use of an unpaired cup, a residue from the wedding gift service which, precisely because of its memorable character, is chosen as a container for daily therapy and also as a *memento* of an important practice not to be forgotten. These are mere examples of daily routines so charged with symbolical meaning that they are closer to an almost magical or religious ritual.

A more prosaic provisional list of issues highlighting the symbolic dimension of the use of medicines may include in general the consumption or non-consumption practices that patients adjust themselves according to their beliefs, according to the resistance or refusal to take certain medicines, as well as the expansion of the sense of medications in terms of *metaphoric and metonymic associations* (van der Geest & Whyte, 1989).

Therefore, many open questions are meant to invest the patient relation with medications and one's cultural traits, routines, rituals, ideologies, values, beliefs, and even prosaic consumption behaviours learned *via* consumption habits related to other typologies of everyday goods and commodities.

To Design the Use of Medications: A Few Steps Forward

Industrial medicinal specialties can be solid, semisolid, liquid and gaseous. The same active principle can originate different physical *shapes ranging from tablets to capsules, powders, gels, vials, syrups, liquid solutions, or drinks.* By shapes we intend the body of prescribed and designed tangible properties allowing the sequence of actions to fulfill the medication management successfully. The final *configuration and identity that a medication may take, although dependent on the chemical-physical composition of its principle, may provide* — or better, should also provide — important information on the intake and use methods throughout its life cycle *(*Overgaard et al., 2001). As every medication also needs to be displayed, sold, stored, protected and preserved, it not only requires keeping the active principle stable but it also implies some affordance priorities such as:

- Allowing suitable methods for handling and intake.
- Avoiding perceptive difficulties or misunderstandings for the end user.
- Expressing clear identity traits so as to be recognizable even when unpackaged and presented in loose form.

Such an inherent set of basic, almost elementary *designed* properties of medications is often far from complete, or poor, even neglected entirely in worst cases. Not only may the designed prop-

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erties of medications often be unsatisfactory, but medicines are not necessarily explored by default as *commodities* requiring positive affordances modelled on users' behaviour (Akrich, 1998).

Being respectful of the sensitive side of dealing with the *materia medica* that alleviate ill health, as well as aware of the amount of complex factors investing the design of pharmaceuticals (chemical principles, regulations, stakeholders' involvement, large scale healthcare policies), we are limiting our perspective to no more than a few wayfindings for orientation.

While still lacking a robust formalization for our reflections — and provisionally inspired by the studies a number of research traditions have already fully consolidated, especially in the field of social sciences (Kleinman, 1980; Chast, 1995; Akrich, 1995; 1996; 1998; Akrich & Méadel, 2002; Wyatt et al., 2004; Borgna, 2005; Fainzang, 2001; 2003; 2005; 2012; Vicarelli, 2009) — we limit ourselves to evoking integrative domains for an inquisitive *design for care* agenda for medications, where "Design can bring care to presence" (Rodgers et al., 2019, p. 74), as in the wider intention of the design for healthcare advancements (Jones, 2013; Tsekleves & Cooper, 2016; Groeneveld et al., 2018; Nusem et al., 2020).

This is why we wonder whether individual different sensitivities about hygiene, privacy, modesty, embarrassment, inadequacy, need for autonomy, and objective and subjective abilities in managing medication, may be a motivation to assign the users' body an autonomous formalized statute — *a statute of the body* (Borgna, 2005) — when considering medications from the design angle. Furthermore, we advocate the relevance of letting medicines be considered *designed materia* — along with *materia medica* —, so as to incorporate person-centered medication requirements into more generalizable design concerns.

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