Designing Mindful Interaction: The Category of Performative Object

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This research is concerned with design as a means for creating mindful interaction through the use of objects in social contexts. The assumption is that artifacts can stimulate the user's behavior by means of their function, thus causing mindful reflection and interaction. At the core of the study was the identification of a new category of products with these qualities of interaction, which I have termed "performative objects." The paper presents part of a larger study.[1] It presents a summary of the research problem and the concept development, testing, and considerations on the usefulness of the proposed concept for design.

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Genesis of the Research Problem: Discovering Performative Objects

The research problem evolved from observations and reflections on my own practice in silver and tableware design. The starting point for this research was a project called "Social Cups," which I did in 1999. The social cups were designed to actively explore the social interaction within which they are used, and to make the user aware of this interaction and reflect on it. The shape of the cups resembles a champagne glass without a stem and base. Instead, the cups each have a little connector that enables them to be connected and thus stand. When at least three cups are connected, they form a stable unit. In this way, people are encouraged to explore their interactions when using the cups (Figure 1).

1 K. Niedderer, *Designing the Performative Object: A Study in Designing Mindful Interaction Through Artefacts* (Ph.D. thesis, University of Plymouth, UK, 2004).

Figure 1
"Social Cups," Kristina Niedderer, 1999.
(All photographs by the author.)

The piece raised some debate about the potential and value of the object to influence interaction. There were doubts about perceptions of predictability with regard to use, as well as considerations about the potential of design as a social mediator. Both doubts as well as expectations were raised centering on my intervention with function, which somehow subverted the norm. This sparked the desire for a systematic inquiry into the phenomenon described. The assumption was that some objects could influence interaction more actively than others due to the manipulation of function. The aim was to better understand the characteristics of these kinds of objects, their impact and design, and if they could be useful as a wider concept for design.

To articulate and frame my inquiry, I called the group of objects that I wanted to investigate "performative objects" (POs) because I assumed that they would make their users perform in a particularly mindful way. The concept of mindfulness refers here to the attentiveness of the user towards the social consequences of actions performed with the object.

The conjecture was that we can design artifacts that communicate and cause mindfulness of others in the context of social interaction by means of a modification of function, and that such artifacts should be called performative objects. Furthermore, the claim was that POs have not yet been recognized as a separate category, and therefore they have not yet been put to their full potential use. The core of this study involves identifying POs as a separate category of definable design objects.

In the conjecture of the PO, I made three (as yet) unsubstantiated assertions. First, that there are POs. Secondly, that they represent a separate category of definable design objects. And third, that these objects have not yet been put to their full potential use. In order to identify POs as a separate category, it first was necessary to find out what POs are by defining their characteristics. Then it was necessary to distinguish them from other categories of objects in order to show their originality. Finally, the benefits of proposing this new category were assessed. This resulted in the following research questions:

1. What are "performative objects"?
2. Can we distinguish them as a separate, new category?
3. What are the consequences of identifying and designing them?

In summary, the questions ask for the development and testing of the concept of the performative object with regard to its realization and its distinction from other categories of objects. The next step was to determine the strategy for the inquiry.

Inventing the Performative Object:
A Naming and Classification Study

Most important, the activity of proposing the PO as a new category determined the research as a naming and classification study. Fawcett[2] explains that naming and classification are descriptive theories. They "are needed when nothing or very little is known about the phenomenon in question," and they "state 'what is.'" With regard to the study of POs, the task of the naming was to identify and qualify the phenomenon under question (Question 1: What are ...?). The task of the classification was to identify how the phenomenon relates to other (related) phenomena (Question 2: Can we distinguish ...?). Accordingly, the first part of the study was used to develop the concept of the PO: the second part was used to test the concept.

The concept development was based on a review of the literature and developments in the field. It served to define the characteristics (key concepts) of the concept (theory) of the PO. The key concepts are interaction, mindfulness, and function, and have been identified in the genesis of the study. For the testing, it was necessary to decide whether to conduct it empirically or theoretically. This was determined by what the testing had to show, i.e., that the concept of the PO is possible and probably existent, and that it is original. In order to show that the PO is possible, it was necessary to demonstrate that it is possible to cause mindfulness by means of function. In order to show that the concept is original, it had to be demonstrated that these kinds of objects do not already exist as a category with another name.

Establishing the originality of the concept and category of the PO is an essentially theoretical process, which was achieved through a comparison of examples. Establishing the possibility of the existence of POs could be conducted through either conceptual analysis or empirical testing. I decided in favor of the theoretical route, establishing the characteristics of POs through conceptual analysis. The aim was to develop a framework with which to test the concept of the PO theoretically through comparison. This framework may serve in future for the evaluation of related work on an empirical level.

For the conceptual analysis and comparison, I used a number of drinking vessels as core examples because of the distinct position of the drinking vessel in the context of social interaction, and because the simplicity of the object helped to demonstrate the concept of the PO in simple terms. The choice of the drinking vessel also provided coherence with the examples from which the research originally evolved. Additionally, a small number of examples from product and interaction design have been used to show the significance of the PO as a general design concept.

2 J. Fawcett, *The Relationship of Theory and Research* (Philadelphia: F. A. Davis Company, 1999), 15.

The Concept Development:
Defining the Characteristics of the Performative Object

The following presents a summary of the concept development of the PO.[3] The concept development comprises a literature review of the three key concepts of interaction, mindfulness, and function in the context of design. The relationship of the three key concepts has been established with the conjecture of the PO in the genesis of the study, and is understood to be such that interaction is the context in which mindfulness may occur, caused by the performative object's function. In the process, interaction also becomes the object of mindful awareness. Through the discussion of the three key concepts, a comprehensive understanding of the concept and category of the PO was developed.

Interaction in Design

The current association with interaction in design is that of human-computer interaction (HCI) in "interaction design," often also associated with "experiential design."[4] With regard to this, Buchanan[5] remarks that:

> There is a common misunderstanding that interaction design is fundamentally concerned with the digital medium. It is true that the new digital products have helped designers focus on interaction and the experience of human beings as they use products. However, the concepts of interaction have deep roots in twentieth-century design thinking and have only recently emerged from the shadow of our preoccupation with "visual symbols" and "things."

In due course, Buchanan[6] defines the whole of interaction design more broadly as:

> ... focusing on how human beings relate to other human beings through the mediating influence of products. And the products are more than physical objects. They are experiences or activities or services, all of which are integrated into a new understanding of what a product is or could be.

This view provides the basis for my understanding of interaction in design, which evolved from interests in the impact of the artifact/object on social interaction within and through use. This understanding suggested a triangular relationship between person/human – artifact/object – person/human (Figure 2).

The further analysis of interaction in the context of design showed that interaction can be understood either with reference to the design process (e.g., designer-user-interaction), or with reference to use (e.g., human-object-interaction/human-object-human-interaction).

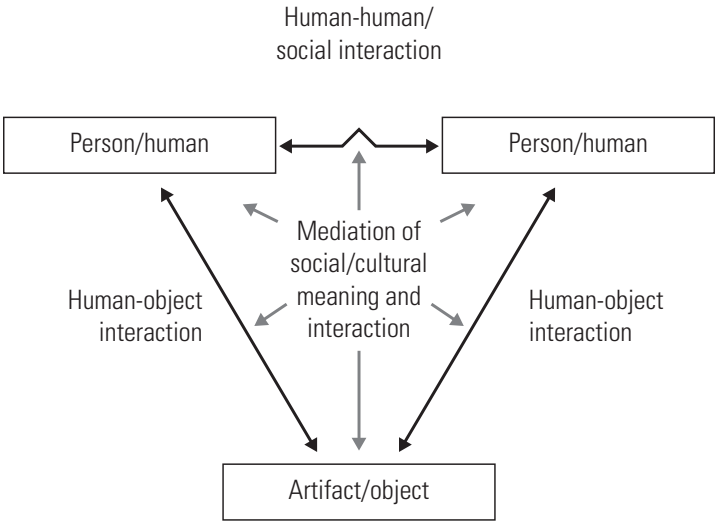
3 K. Niedderer, *Designing the Performative Object* (2004), 36–74.

4 See, for example, N. Shedroff, *Experience Design* 1 (Indianapolis, IN: New Riders Publishers, 2001).

5 R. Buchanan, "Design Research and the New Learning," *Design Issues* 17:4 (2001): 3–23.

6 Ibid., 11.

Figure 2
The Triangular Relationship of Interaction



Looking at interaction in terms of use, emphasis commonly is put on interaction with the object or medium and its technological aspects, and on a functional and/or ergonomic level, rather than on aspects of human social interaction which it may facilitate. For example, mobile phones are designed and developed with regard to the technical potential and simplicity of use (i.e., with regard to efficient functionality, rather than with regard to the social consequences of use or abuse). Attention to efficient functionality also can be found in "user-centered design," usually with an emphasis on ergonomics and anthropometrics.[7,8] Although more recent approaches[9] take the aspect of the "well-being" of the user into account, and aim to enhance it, human-human interaction (i.e., user interaction) usually is not considered as the source of this "well-being" in the context of the use of design. "Well-being" refers here to the "state of being happy, healthy."[10] As a result, objects are designed to make people independent rather than to make dependency and care acceptable as an integrated part of use.

In reviewing current design developments, only a small number of experimental design projects could be identified to explicitly explore interaction (two of which I will discuss in the following sections). Also, their potential has not yet been commonly recognized and explored, and the existing approaches to user-interaction do not show a coherent basis.[11] This raised the question of how, in principle, an object could be designed to raise awareness and reflection (i.e., mindfulness of the social consequences arising from its use). In order to find out whether and how design objects could be used to cause mindfulness, I reviewed the concept of "mindfulness."

7 J. Panero and M. Zelnik, *Human Dimension and Interior Design* (London: Architectural Press, 1979).

8 D. A. Norman, *The Design of Everyday Things* (New York: Basic Books, 2002).

9 S. Boess, *An Indian Who Doesn't Know How to Grow Maize: Reflecting on a Designer's Experience of User-centered Designing* (Ph.D. thesis, Staffordshire University, UK, 2003).

10 Ibid., viii.

11 K. Niedderer, *Designing the Performative Object*, 38–44.

Introducing the Concept of Mindfulness in Design

Mindfulness is a term that is increasingly used in psychology and education.[12, 13] It is described as an attitude of both awareness and attentiveness. Mindfulness as a state of awareness or consciousness implies my presence to the moment, where I look *at* my experience, rather than *through* it.[14, 15] Depending on the context, I can be conscious of my surroundings or myself, or of something or someone. Mindfulness in the sense of attentiveness usually occurs in the context of social interaction, where it is associated with caring attention towards a person.[16, 17] This shows that mindfulness has two components: one is that of awareness or consciousness *per se*. The other is that of awareness or attentiveness "of something," (i.e., the phenomenal content).[18] One is the frame of mind, while the other is its content.

Although desirable as an attitude, it seems that mindfulness is not an easy thing to achieve. Langer raises the question why we are not always mindful and how we could promote enduring mindfulness.[19] Independently, Langer[20] and Udall[21] draw the conclusion that we need to break through established patterns of perception and experience (i.e., preconceptions) in order to achieve mindfulness in new situations. This raises the further question of how to break open established patterns of perception. The answer is that, whether deliberately or accidentally, this breakthrough to mindfulness usually seems facilitated through an external agent,[22, 23] and that this external agent must be capable of disrupting consciousness in order to break open common patterns of experience and preconceptions.

This turns attention to what form this external agent may take. While it may be possible to achieve mindfulness through education and training (e.g., in the medical profession, nursing, and other forms of care), by its nature, mindfulness remains elusive where this educational context (external agent) is not provided. To take an example from design, in sustainable design much of its effectiveness depends on implementation, which usually is achieved through education, and often reinforced through law. For example, a few years ago, Germany was trying to stop the flood of plastic shopping bags. Therefore, by order of the government, nationally, the use of fabric bags was introduced. To start the scheme, in the first year, the fabric bags were issued for free while a charge was placed on plastic bags. In due course, the scheme was adopted very quickly by the population.

The dependency of mindful behavior on educational measures raised the question whether the design object could be designed to act as external agent without an educational context (i.e., whether it could be designed to cause a breakthrough in perceptions and thus mindfulness by its own means). Insights from observation of the use of objects have led me to the assumption that objects can be designed to cause mindfulness by their own means, and that it

12 E. J. Langer, *Mindfulness* (New York: Addison Wesley Publishing Company, 1989).

13 N. Udall, *An Investigation into the Heuristics of Mindfulness in Higher Art and Design Education* (Ph.D. thesis, University of Surrey, UK, 1996).

14 *Conscious Experience,* T. Metzinger, ed. (Paderborn, Germany: Schöningh / Thorverton, UK: Academic Imprint, 1995), 8–21.

15 N. Udall, *An Investigation into the Heuristics of Mindfulness in Higher Art and Design Education,* 11–12.

16 E. J. Langer, *Mindfulness.*

17 J. K. Burgoon, "Mindfulness and Interpersonal Communication," *Journal of Social Issues* (Spring 2000). Online at: www.findarticles.com.

18 *Conscious Experience,* T. Metzinger, ed., 8–21.

19 E. J. Langer, *Mindfulness,* 121.

20 Ibid., 19–42.

21 N. Udall, *An Investigation into the Heuristics of Mindfulness in Higher Art and Design Education.*

22 E. J. Langer, *Mindfulness,* 81–114.

23 N. Udall, *An Investigation into the Heuristics of Mindfulness in Higher Art and Design Education,* 107.

is a modification of function that can cause a disruption of experience and thus mindfulness. For example, in the "Social Cups" (cf. Figure 1), it is the way in which a disruption of function (in this case the aspect of standing/non-standing) requires the users to interact with each other in order to operate the object. Consequently, I have investigated function as the third key concept under the assumption that it is the means by which mindfulness can be caused.

Causing Mindful Interaction through Function

Above, I have proposed a change within function as means to cause mindfulness. Before I can make a change, I need to know what the starting point is. If function is to be the starting point, the first step is to clarify what I understand with function. I have examined different definitions and usages of the term "function" elsewhere[24] in order to determine how function with regard to the characteristics of POs can differ from the function of ordinary design objects. Suffice it to say that the notion of function in design commonly designates the object's practicality in use, and that the aspiration for its optimization indicates that design objects are mostly approached with an understanding of efficient functionality.

Within this understanding of efficient functionality, an understanding of function has evolved which often has been expressed as "form follows function" or "function follows form."[25] However, this dictum obscures the nature of function which is not "present" in the same way in the object as for example form. Both the material (pragmatic) and immaterial (symbolic) side of function become apparent in Ligo's distinction of five different aspects or levels of function.[26] On what I call the pragmatic level, Ligo distinguishes "structural articulation," which refers to the object's material structure; and "physical function," which refers to the utilitarian task/value of the object. On what I call the symbolic level, he distinguishes "psychological function," which is explained as pertaining to the user's emotional response to the object; "social function," which refers to the nature of the activity that the object provides with regard to the social dimension; and "cultural-existential function," a more profound cultural symbolic which includes the existential being of the individual.

Ligo's classification shows that, although the material form is one mode through which function becomes apparent, function is not equal to the form nor is it fully visible in the form. Rather, it becomes fully visible in its second mode, in action/use, which is pinpointed in the definition of function as "the special kind of activity proper to anything."[27] The definition characterizes function as an immaterial quality that is bound to the dynamic use of the object. In this sense, function might be understood as "the plan of action that the object represents"[28] in which designer and user share their understanding about the intended purpose of the object.

24 K. Niedderer, *Designing the Performative Object*, 61–69.

25 J. Michl, "Form Follows What?" This paper was published under the same title in *Magazine of the Faculty of Architecture & Town Planning* 1:50 (Winter 1995) (Technion, Israel Institute of Technology, Haifa, Israel): nr. 10, 31–20 *[sic]*. Online at: http://geocities.com/athens/2360/jm-eng.fff-hai.html.

26 L. L. Ligo, *The Concept of Function in 20th Century Architectural Criticism* (Ann Arbor, MI): UMI Research Press, 1984), 21–75.

27 Oxford English Dictionary Online (Oxford University Press), http://dictionary.oed.com. (2004), 3.

28 S. M. Pearce, *On Collecting: An Investigation into Collecting in the European Tradition* (London: Routledge, 1995), 166.

To summarize, I have argued that design objects are mostly approached with an understanding of efficient functionality and that, with this understanding, objects provide a "plan for action," which normally is laid down in the object's function. In this sense, if function implies the preconception of a plan of action and if mindfulness can be caused by a disruption of preconception and the experiences linked to it, then we can conclude that a disruption of function could cause a disruption of this preconception of action and the experiences linked to it, and thus cause mindfulness. In other words, I argue that a modification of function in the sense of a disruption-of-function can be used to break through patterns of perception and preconception, and to cause mindfulness.

Before I move on to illustrate this theoretical discussion through a discussion of examples, I need to introduce one more detail into the argument of function as a means for causing mindfulness. In the above section on mindfulness, I have distinguished the context and content of mindfulness (i.e., as awareness and content of awareness). I have argued that a disruption of function can cause mindful awareness. What I have not yet talked about is what might constitute the content of this awareness. Indeed, in the analysis of examples, it becomes apparent that a second step is needed which provides a content or theme, and which also has the task of compensating for the disruption of action. I have called these two steps the "disruption" and "thematization" of function, which can be linked to the pragmatic and symbolic levels of function, respectively.

Summary of the Concept Development

The concept development has shown that it is possible to theoretically define the category of POs. Its characteristics are mindfulness (aim/affect/result) and a modification of function (means) through which this mindfulness is achieved. The review in the original study[29] also has shown that a category of PO had as yet not been defined.

The Comparative Analysis: Demonstrating Existence and Originality of Performative Objects

On having defined the characteristics of POs, the question was whether one could also identify these characteristics in actual examples. The following section provides a summary of the theoretical testing of the concept of PO through analysis and comparison of examples with regard to identifying these characteristics. The aim of the comparative analysis is, first, to demonstrate that POs exist (i.e., that it is possible to identify a modification of function in the examples as a basis for causing mindfulness). Secondly, the aim of the comparison is to show that the category of PO is original (i.e., that we can distinguish POs from other object categories by means of their characteristics, e.g., art objects, ritual objects, and design objects that are not POs). Thus, the characteristics of function (means) and

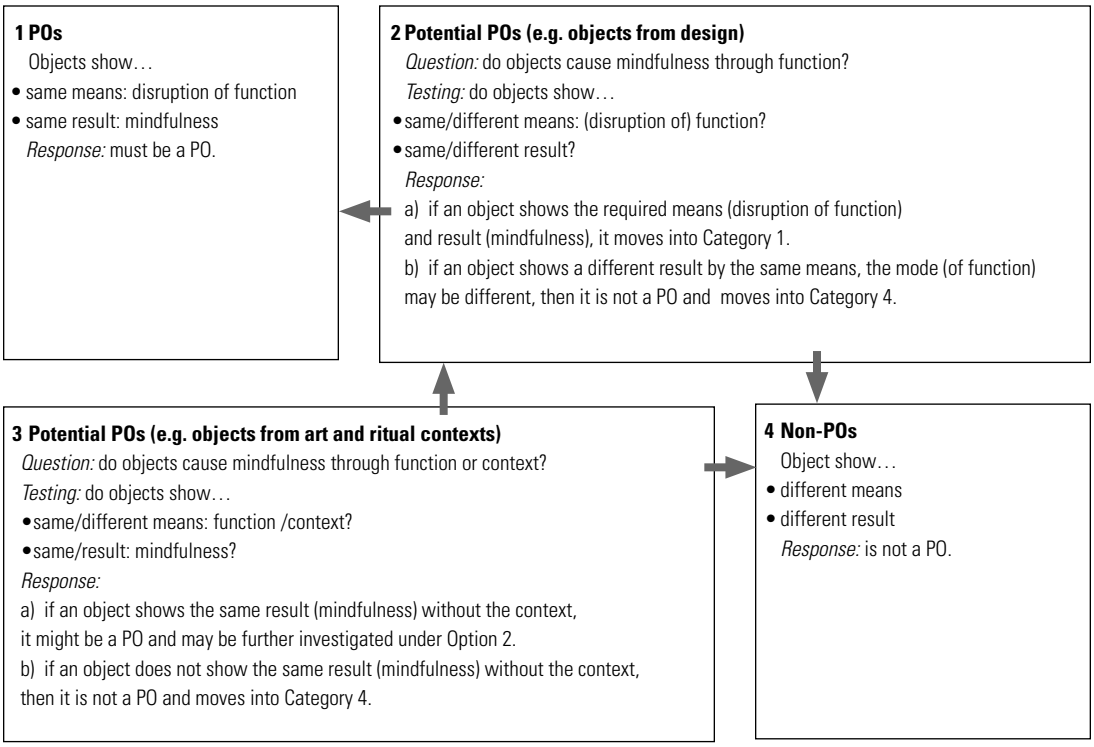
29 K. Niedderer, *Designing the Performative Object.*

mindfulness (result), which have been identified in the concept development, provide the framework for the comparison. (Figure 3). It was expected that objects which cannot be identified as POs on the basis of their function either do not cause mindfulness (e.g., any design objects that are not POs) or cause mindfulness by other means such as a different context (e.g., art or ritual objects).

Figure 3

Performative Square

For the testing, every example is treated as a potential PO and put either into Category 2 or 3 to be analyzed and moved accordingly to the outcome of the analysis into Category 1 (PO) or 4 (non-PO).



The first step in the analysis and comparison of objects is the investigation of whether the objects show a disruption of function. The recognition of a disruption presupposes the recognition of a norm and a deviation from that norm. This recognition is further dependent on the context. Assuming POs to be a kind of design object, they would have to operate in the usual context of design, which was identified above as the context of efficient functionality. For example, if we think of the drinking vessel as a design object, a standard water glass provides something like a norm of usage for cold beverages (Figure 4). It is designed to maximize comfort and efficiency within use concerning all aspects of function (e.g., size and volume, handling and safe standing). In this way, it guarantees "transparent" use.

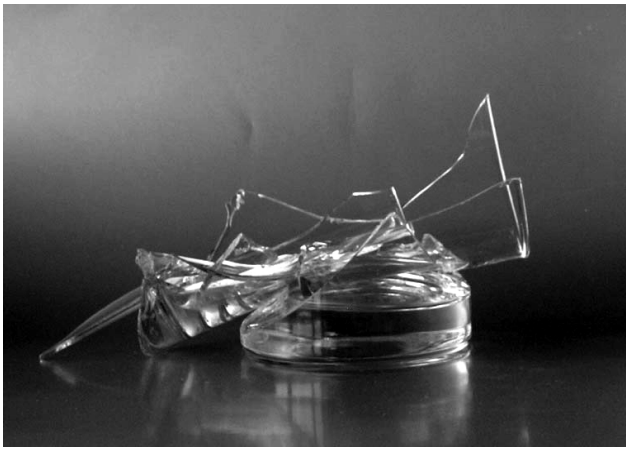


Figure 4 (above)
Water glass.

Figure 5 (above right)
Broken water glass.

It is important to acknowledge the context because things are perceived differently in different contexts. For example, the display of a half-full water glass on a shelf would not draw anyone's attention if it were in a kitchen. But if the same glass is called "An Oak Tree" and/or displayed in the context of an (art) gallery,[30] we allow time to notice the glass and its meaning. Mindfulness therefore can be created through the institutional context of art, which is "a certain set of coordinated social practices."[31] However, the concern here is with objects that can cause mindfulness in the context of everyday use, and not in the institutional context of art.

In everyday context, one recognizes a disruption of the norm of efficient functionality, for example, in a broken glass (Figure 5). Here the disruption of the pragmatic function causes a disruption of the pattern of action. This is bound to lead the user to some kind of reflection. In the first instance, this will be a reflection on the object; thereafter, it is likely to be a reflection on self as Norman[32] has shown in his psychological analysis of objects. He found that, where design objects do not function how we expect, most of the time we do not first question the object but our own abilities to handle them. Thus, malfunctioning (e.g., of broken or badly designed objects, may cause mindfulness of self). However, since they do not allow the resolution of the disruption, the questioning of self and of the object seems bound to end in resignation or negative feelings. This begs further questions of how the result of the disruption can become a positive and desirable (mindful) experience within the use of the PO.

The example of the broken glass has shown that something more than a mere disruption is required to cause mindfulness in the desired sense. From the analysis of examples, it has emerged that, in addition to the disruption, a means of compensating for this disruption is required, which I have called a "thematization of function."

30 See, for example, M. Craig-Martin, *A Retrospective 1968–1989* (London: Whitechapel, 1990).

31 N. Carroll, *Philosophy of Art: A Contemporary Introduction* (London: Routledge, 1999), 227.

32 D. A. Norman, *The Design of Everyday Things* (New York: Basic Books, 2002), viii.

Figures 6 and 7
"Libation Cup," Kristina Niedderer, 2001.

For example, in the "Libation Cups" (Figures 6 and 7), the function of holding liquid is disrupted in a similar way as with the broken glass. However, the users can close the five holes with their fingers, thus restoring the function of the cup. The additional action required draws the user's attention to the cup, and causes reflection on its design and use, and on an additional level of meaning of this use. We therefore can conclude that we can cause mindfulness through materiality.

We can distinguish the twofold process of function that causes mindfulness (i.e., that causes awareness, and guides reflection) in further examples. In the "Social Cups," the rounded foot causes a disruption (not-standing), which can be compensated through the connectors (Figure 8).

We encounter the same phenomenon in "La Grolla" (Figure 9), which is a traditional drinking vessel from the north of Italy. It is still in use today, and can be ordered in the local trattoria. "La Grolla" is served with the number of spouts according to the number of diners who pass the vessel around and drink directly from the spouts. The action symbolically links the diners. The question arises whether this is a ritual object or performative object. Perhaps, in this case, the context might be decisive. Within its traditional context, "La Grolla" might work as a ritual object, reinforcing values rather than causing reflection, especially since it seems to offer just one way of use. On the other hand, the action seems to be embodied in the function of the vessel. Therefore, in a new context, its functional arrangement might cause reflection within use and cause participants to question their interaction; thus mediating interaction in a new way.

Figure 8
"Social Cups," Kristina Niedderer, 1999.

Figure 9
"La Grolla"

The example of "La Grolla" raises the question of what distinguishes the PO from a ritual object. The difference becomes clear when we think of the probably best-known ritual object in Western culture: the chalice. Although visually significant, I would argue that the chalice does not show a disruption of function. Instead, mindfulness is caused by the ritual context. If it was not the context but the object, how could some Christian groups use an ordinary glass to the same effect of causing mindfulness? Or how could a trophy cup, which shows a striking similarity to a chalice of the same period, be used in an entirely different and secular ritual?[33]

In summary, the comparison has shown that it is possible to distinguish the category of PO, and to identify its characteristics of mindfulness in relation to a modification of function. Therefore, different levels of mindfulness can be achieved (i.e., mindfulness of the interaction with the object and/or of interaction with other people through the object).

The Significance of the Category of Performative Object for Design

In the following, I discuss two examples from product and digital interaction design, respectively, to show the wider significance of the concept of performative object for design. In terms of design products, only a few outstanding projects could be identified outside the domain of "digital interaction design" that start addressing the product's consequences for human social interaction. One such exception is the bench "Come a little bit closer." It is a product of the Droog Design group[34, 35] and was designed by Nina Farkache in 2001. The bench consists of a steel frame. The top surface is made up of glass marbles, which act as ball bearings and on which the actual seating surfaces "float." Because the seating shells are not fixed to the frame of the bench, but glide on the ball bearings, the design allows users to physically move closer without changing seats. The design plays with people's habitual behavior in public places, which is to keep a certain distance from people whom we do not know, and therefore to sit down at opposite ends of a public bench. Through its design, the bench allows and symbolically suggests decreasing spatial distance if, in a waiting situation, the wish emerges between the strangers to decrease social distance and to engage in conversation. In this way, the bench questions and makes us mindful of our perception and behavior towards other people in public spaces. Concerning the interpretation of this object, while without the knowledge of the concept of PO, we would be able to appreciate the design for its clever and witty solution. But knowing about the category of the PO, we now are able to understand and explain its underlying conceptual and functional mechanism. This means we can relate the underlying behavioral concept (people keep distance) to specific functional elements of the object (seating shells are not fixed [disruption] but glide on the ball bearings [thematization]). With this understanding

33 H. Schadt, *Goldschmiedekunst: 5 Jahre Schmuck und Gerät* (Stuttgart, Germany: Arnoldsche, 1996), 115 and 138.

34 R. Ramakers, *Less + More: Droog Design in Context* (Rotterdam, NL: 010 Publishers, 2002), 57.

35 *The International Design Yearbook 2002,* R. Lovegrove, ed. (London: Laurence King Publishing, 2002), 62–63.

of how conceptual ideas and physical phenomena link, both the social significance of POs, as well as the scope for potential application of POs in design, should become clear.

With the last example, I want to reemphasize the social significance of POs. I have chosen this last example from digital interaction design because, recently, there have emerged several institutions or project groups with an interest in exploring interaction design in a wider sense (e.g., D&AD[36], the Interactive Institute in Sweden, or Ivrea[37] Institute for Interaction Design in Italy). In this arena, we find remarkable approaches such as "Brainball," an interactive game for two people which has been developed by the Interactive Institute with the objective of increasing relaxation.

"Brainball" consists of a headband with electrodes that reads a player's brain activity using an electroencephalogram (EEG). Two players sit opposite each other at a table, each wearing a headband. In the middle of the table from one short end to the other is a clear plastic surface with a small steel ball rolling on top of it. When either of the players presses the "start" button, the ball rolls away from the person who is most relaxed and toward the other player. The only way for the other player to defend is to become more relaxed. When the ball reaches one end, the game is over.[38]

This object combines the subversion of function and the aspirations for social impact, which we have seen in the previous example, to maximum effect. What makes it special is that the player can only move the ball when *more relaxed* than his/her counterpart. Thus, this game turns common expectations and behavior in the most unexpected way "upside down," and the fundamental nature of the issues raised becomes explicit. In this example, the effect seems particularly striking because the action (of moving the ball) can only be accomplished when actually achieving the "new" attitude (of becoming more relaxed), which additionally and dramatically reveals the psychology of the participants. Questions arise such as: "Can we feel relaxed on demand in order to win?" or "Do we lose the aim to win when we are relaxed enough that we might be able to win?" or "Do we even have to give up the wish to win in order to achieve the necessary state of relaxation?" thus revealing what is at stake. This is not just another object— another function—but essentially questions what we understand by function, by how things work. With regard to the object, it questions our outcome-related thinking, and directs it towards process-related thinking (which Langer proposes with regard to achieving mindfulness[39]). This, in turn, questions the understanding of how one relates to the other participant, because the ordinary belief that more determination is needed to succeed no longer works. This shows that the subversion of function can be employed to question essential issues, such as our understanding of relating to others through competition.

36 D&AD *SuperHumanism Conference* 2001 (Online debate at: www.dandad.org/content/super/index.html) (2003).

37 Ivrea (Online at www.interaction-ivrea.it) (2003).

38 S. Ilstedt Hjelm, "Research + Design: The Making of Brainball," *Interactions* 10:1 (2003): 26–34. Also available online at: http://smart.interactiveinstitute.se/smart/ publications/pubs/brainballInteractions.html.

39 E. J. Langer, *Mindfulness*, 33.

It seems that, in this sense, POs can have ethical implications that impact our social values, our interactions and interrelations, and thus on society as a whole. It also seems that the concept of the PO is applicable in a number of different design situations. Although I have only been able to deal with a small number of examples, with a primary focus on the drinking vessel, I have been able to include a small variety of other examples from digital and non-digital design. Thus, the last example from digital interaction design raises expectations of a fertile field for application.

Conclusion

This is a report of a larger study. Therefore, it was only possible to provide a summary of the main concepts and argument. The outcome and contribution of the study is that we can define the characteristics of POs (i.e., mindfulness as caused by a modification of function) and that we can distinguish POs as a separate category of definable design objects by means of these characteristics. We also can project the consequences for both society and designers. With regard to society, the aim of the PO is to shift consumption towards a more mindful (i.e., socially-reflective approach), thus transforming the role of the user or consumer into that of the participant. The implication for the designer lies in a change in the design process, which requires starting the process with the observation of social situations and behaviors.

This study offers a number of possibilities for further research into the concept of the PO. It provides the theoretical basis for empirical testing, including the design, development, and empirical evaluation of POs. Future research may further be concerned with the application of the concept, for example, its application to interactive design might be of particular relevance. Research into its application also may be concerned with changes in the design process, and with ethical issues which arise with regard to the responsibility of the designer. Finally, in the longer term, a study might seek to assess the benefits for society concerning sociability and community.