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Material Interactions[1] –embodied exploration of affordances.

"..it is not enough to criticise, it is necessary to show, objects and even people, to touch things with one's fingers.." (Bourdieu in Garnham and Williams 1996 (1980):51)

This paper considers the relationship between design and consumption by re-evaluating the conventional focus of consumption studies on the cultural and symbolic aspects of objects. It does so by considering two ideas about materials that are found in design education and practice – 'empathy' with materials and reflective 'conversations' with objects. It supports Dant's (2005) proposition that it is useful to understand our relationship to the material world by thinking about our embodied interactions with it – though it does this from the standpoint of a designer rather than a sociologist.

In the process, it establishes that simply asking designers about consumers' experiences does not necessarily produce valid insights because designers may think of themselves as rather different from consumers. Designers may provide a picture of consumption distorted by their professional expectations, which obscures as much as it elucidates. This paper suggests that witnessing everyday ways of exploring the material world that we might think of as part of the designer's perceptual stock in trade can shed light on the physical dimension of material culture, the better to understand the relationship between they physical and the cultural.

The backdrop for this – and its inspiration – is a realisation that if we are to understand material culture, which is where designs actually live, we need to extend from analysing the meaning of material objects in the symbolic register to the full 'embodied' relationship that we have with them. Here, writers such as Tim Dant (1999, 2005) and Alan Warde (1997) have led the way. As Dant so pithily expresses it, "…human interaction with objects is often directed primarily at the material life of humans." rather than the symbolic (2005: 7). Analysis of interactions with the material world can often usefully centre on the materiality of that interaction rather than the symbolic communication it may also entail and Dant has set out a theoretical framework through which to understand these interactions. This paper discusses some

[1] This is Tim Dant's (2005) term for our embodied relationship to objects.

empirical work that focused on materiality by studying actual materials – plastics – and the part they play in the way we interact with objects.

The paper uses as an example the application of plastics for domestic food containers and identifies connections between these objects and culturally defined ideas about health and the safety of food, as well as ideas about the palpable objective qualities of the material. As a material for food containers, plastics appear to be salient to consumers in themselves and stimulate quite clear statements. This makes it possible to introduce a discussion of the relationships between different aspects of the materiality of the 'stuff' being consumed. At issue here are the subtle objective properties of polyethylene, the type of plastic commonly used for food containers, the way in which we investigate the qualities of this 'stuff' and the ideas about them that we bring to that investigation.

The paper uses the idea of the 'affordance'. This word denotes the identifiable things that the world affords us, and was coined by perception psychologist James Gibson (1977). Alan Costall (1995) and Harry Heft (1989) modified the concept it denotes in a sociological direction. Oversimplifying, what an object affords is taken by Gibson to reside primarily in the objective properties it possesses and which humans engage with through their perceptual system. Costall and Heft have drawn out of Gibson's ideas what they see as the potential to emphasise the role that culture, working through the intentionality of perception, has in the recognition of affordances. For this paper, the crucial element in this scheme is that affordances do not exist in objects or in people but in the interaction between the two. For this reason, the idea offers a rather useful way of moving beyond the symbolic register to get a fuller understanding of the meaning of objects.

The idea of the affordance, because it acknowledges the importance of the physical dimension of our interactions with the material world accords a sort of agency to the objects with which we interact. Dant (2005) points out that despite Costall's contribution to the debate, Gibson's stress on the physical dimension of affordances reduces its usefulness for helping us to understand our relationship to objects. He offers a phenomenological remedy to this, which provides a platform for understanding our relationship to the material world that unifies the cultural and the physical through the principle of embodiment. This paper suggests that the affordance concept may still be useful, particularly when considering the role of the material base of interactions with objects, and in the light of Heft's comments about the culturally based intentionality that is necessarily a part of affordances.

There follows a short discussion of possible relationships between design and every day engagement with the materiality of consumption – from the perspective of a design educator with extensive experience of working with materials in a craft context. From the perspective of building an understanding of the relationship of design to consumption, two elements of design education are useful.

Design education – embodied knowledge; professional narratives

UK Design education has set great store by the learning that can take place through manipulating materials. The idea is that by manipulating materials students build a resource of 'tacit' knowledge they can be draw on in professional life as the basis for correct decisions about how to deploy materials. Students have traditionally gained this knowledge through

exploring materials by working directly with them. This involves long periods of intimate and close attention to the consequences of particular actions – so intimate and close in fact that the jargon of applied arts education suggests that materials are accorded a degree of agency, or at least human qualities. Staff and students talk of one of the objectives of design education as developing 'empathy' with materials.

The fact that this is literally impossible, since materials can't have human feelings, emphasises in its poetic contradiction how intense it is assumed are the interactions that a craftsperson or design student has with materials. It demonstrates the expectation that in the process of learning how to put materials to use, and in using them thereafter, the designer must listen to the ways in which the materials 'talk back' to them. The ways a material responds to being treated like this, or like that, the sounds it makes, its colours, its feel under the fingers are not taken to be just physical facts that could be measured and quantified, but are qualities that indicate the 'character' of a material. This character must be worked with if a design is to be successful and can be learned and understood only through physical interaction with the material. We will shortly see that these skills are not confined to designers, and that we deploy them in the field of consumption as we evaluate how we might integrate objects into our lives.

In parallel to this embodied knowledge, design education also builds a whole raft of cognitive skills. Along with these come attitudes to the professional role of designers that seem to colour views about what consumption is like for non-designers. For instance, it seems that designers are unlikely to be able to speak convincingly about consumers' perceptions of and attitudes to plastics. Among the possible reasons for this is the fact that designers think of themselves as distinctly *different* to consumers; they are consumers themselves of course, but their specialist knowledge demarcates them from everyone else. And of course this is true, in that designers have a measure of technical knowledge that other consumers do not. But this difference appears to lead to designers the conclusion that as well as being ignorant compared to them, consumers as relatively passive in their interactions with the material world – they only notice designs when they fail.

The following quotations from an industrial designer in his late 20s express this rather clearly.

> *"I mean if I wasn't a designer, if I was a consumer and I didn't know anything about materials, I mean a lot of people know about materials but not to the depth of what designers or engineers or people within that industry know about materials."*

> *"…it's very difficult to talk about consumers in the sense of what they perceive because you know, do we give them too much credit? […] they don't do a design job, so how much do they actually know?"*

These views may not be typical of designers in general. However, they suggests that the professional attitude of designers to consumers may lead them to deny that the way they discover the affordances in materials and objects – that empathy with materials gained in their training – is available to and used by consumers as well. This

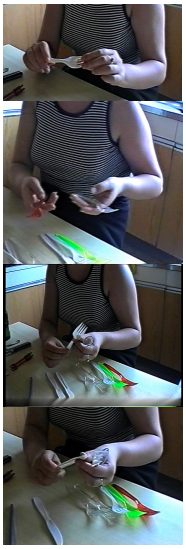
designer at least, feels that this sort of exploration of materials is a feature of his professional training and perspective:

> *"…as a designer I've got a nasty habit of going round tapping everything. You start hitting everything, and after a while you gauge what, what's plastic, what's not, what's metal, what sort of material is it, is it glass, is it…"*

In contrast to this everyday professional analysis of the materials world, "nasty" presumably because it is unusual, consumers may discover the properties of the material world, but only by accident, when objects fail. They:

> *"…realise what is plastic and what's metal, they might put it through the dishwasher a few times and find out it's plastic…"*

Everyday embodied exploration of objects



In contrast to the impression this designer gives, we all do seem to develop knowledge of the material world through just this sort of exploration. Individuals given cutlery and other familiar types of object in various materials could talk in the abstract about their physical interaction with objects in terms of their materials. For example, one of the interviewees compared wooden and plastic tool handles in this way:

> *"…plastic ones are all slippy and if you're working hard and your hands get – they slip off plastic ones […] wooden ones just feel nicer"*

It is notable that their responses also suggested that to speak about the materiality of objects it seems necessary to either summon up past interactions as above, or to interact with them physically, to bring them into what Dant (2005) calls their phenomenal 'field'. Given objects to talk about they were quite ready to pick them up and explore them physically as they spoke. They held them up to the light, stroked them with their fingers, tapped them with their fingernails, scraped their fingernails against them, and flexed them (in one case to breaking point).

They tested them. They experimented with them. They entered into a conversation with them that is reminiscent of a conversation with a real person. They made a series of 'statements', a stroke of the hand, flexing with the fingers, tapping with the fingernails, and saw what the 'response' of the object was – what sound it made, how far it flexed, what its temperature was, whether it broke. They explored the objects to work out what they might be good for and they also invoked ideas about the materials, which affected their evaluation of the objects and what appropriate uses for them might be. For instance they invoked ideas about health and hygiene and about social conventions – plastic cutlery is appropriate for barbecues and needs to be thrown away because the porous nature of the material means it absorbs 'stuff' which might fester and make you ill.

This latter point might make it seem as if it customary uses for plastics that defines their appropriateness – that these malleable and infinitely 'plastic' materials are defined by their uses and they are read simply in the context

of our previous experience of them. However, it seems that the embodied exploration of the *matter* of which objects are made is a particularly significant element of our interaction with objects because it is this which conditions the way that they 'work', or not in particular social situations. It is this embodied exploration on which we may draw in evaluating similar objects later on.

There was evidence for instance that at the time of the interview the participants already knew from their past experiences with them quite a lot about the microscopic texture of the materials, as well as the feel of them to their fingers. We know from experience that plastics discolour, that they absorb dirt in a particular way - the participants drew on such memories. The phenomenological scheme that Dant offers drawing from Merleau Ponty accounts for these features of the participants' interactions in terms of the role that memory plays in embodied perception (2005: 96). It also addresses the physicality of the participants' interaction with the objects that. For Merleau Ponty "our senses 'question' things and 'things reply to them'" (Merleau-Ponty 1962: 319 quoted in Dant 2005: 103).

The writings of Donald Schon are commonly referred to in Design (and much other) pedagogy to help conceptualise such interactive relationships between individuals and their professional world. The artist or designer is said to 'reflect on' a situation that presents itself as part of their practice, and to 'reflect in' the actions that the situation demands. 'Practice' is understood to require both sorts of reflection, the former required when the latter throws up new circumstances.

The practitioner allows himself to experience surprise, puzzlement, or confusion in a situation which he finds uncertain or unique. He reflects on the phenomenon before him, and on the prior understandings which have been implicit in his behaviour. He carries out an experiment which serves to generate both a new understanding of the phenomenon and a change in the situation. (Schön 1983: 68)

Again, everyday interactions with objects in which we do tiny physical experiments to work out how we should proceed with them, what they are good for, suggests that this is not just a pedagogic principle, but one we use naturally as we encounter the material world and work out what it affords us.

Plastic used in the kitchen illustrates this also. There is a set of relationships between our knowledge of plastics as the product of the chemical industry – our cultural knowledge – our embodied interactions with plastic food containers, which we find more or less useful, and the consequences of some of those interactions. When we use plastic food containers, we can reflect on what we know about them - their chemical origins; their competence to provide an airtight seal against contaminants – at the same time as we interact with them and see the way they respond to our everyday 'experiments' with them. Using these objects and seeing what happens is the form of our experimentation.

One of the things that happens when we use plastic food containers is that the waxy polythene that many are made of changes. It changes chemically, becoming less supple. Its porous structure means it changes by absorbing colours and dirt from the environment as it becomes scuffed and abraded. We might notice it stiffening and staining. At a certain point it will become unacceptable for use round food; it will begin to disgust us, though the threshold of evident change that brings on this disgust

is likely different for each person. Then we might use it for something else, holding household goods for example, or throw it away. What is happening here? An object that in one state invokes trust because of its material in another state invokes mild disgust. The results of our interactions with it through the process of its physical change appear to encourage us to reflect on it via contradictory sets of ideas, both of which are available to us at any point in that process. Even when it is new, we know from our memories of other plastic objects that this pristine object will degrade in the way characteristic of the materials.

Gibson's idea of the 'affordance' may be useful to help us to see the structure of this changing relationship. An affordance denotes a situation where the relationship between an individual and an aspect of the material world, an object for example, means that the object affords something for that person. According to Gibson, affordances do not exist in the object, or in the person, but in the relationship between the two.

He encapsulates the idea of the affordance as follows:

> *"..the affordance of anything is a specific combination of the properties of its substance and its surfaces taken with reference to an animal." (1977: 67)*

So an affordance always has two elements; the physical conditions that form what Gibson calls an 'invariant' in the natural or human environment, and the animal, or human, for whom this 'invariant' is relevant.

As I suggested earlier, while Gibson's emphasis was on the physical 'ground' of affordances, Costall (1995) and Heft (1989) have argued that the idea can accommodate affordances that are defined by culture as much as by nature – we explore the world with 'cultured bodies'. If we accept this accommodation, acknowledging Dant's observation that it leads to a form of interpretivism, it is possible to map the changing affordance of plastic in food containers. Crucial to doing this is the relational nature of the affordance. It is not ***in*** the plastic object, nor is it in the person using it, it is in their relationship, summoned up by both the properties of the object and the ideas that are brought to mind by reflecting on those properties. So, as the object changes, as its physical properties alter, confronting the user with a new situation to reflect on, so do the affordances it can potentially be part of.

Whereas a new polythene food container may afford hygiene, a 'distressed' one may afford disgust, once the everyday 'experimentation' that its owner or user puts it through brings to the fore the objective properties of the material that have the potential to constitute the material 'ground' of this affordance. Whereas at a particular time, the objective 'ground' of an affordance is stable – in the absence of a physical catastrophe like putting the sandwich box on a hot surface – the subjective, or social/ cultural aspect of an affordance is not. It is possible therefore for more than one affordance to coexist in the same object. One participant for instance told of using a plastic box for her child's school lunch, presumably because it afforded hygiene and physical protection for the food, and she also betrayed anxiety about the chemical origins of the material. She said that she would not use a Tupperware box to carry sandwiches without wrapping the sandwiches first in metal foil, suggesting that

> *"The plastic would affect the taste of the sandwich for me"*

which implies that she has some awareness of the fact that rather suspect chemicals called Phthalates do leach out from PVC, if not from polythene. Her statement also implies her awareness of plastic's porous structure – knowledge she explicitly demonstrated through comments about the effect of keeping tomato soup in Tupperware. Two potential affordances exist in her child's sandwich box; one affords use, the other anxiety. For her, wrapping the sandwiches 'works round' the knowledge that could elicit anxiety and preserves the useful affordance that the sandwich box can provide.

The exploration of and experiments with objects that is part of our interaction with the material world is built into the idea of the affordance. Gibson suggests that the perception of affordances results from 'perceptual learning'. Although his examples use vision as the prime pathway for this learning, the work of EJ Gibson (1984, 1988, summarised 2000) makes it clear that in the process of individual development the exploration of affordances draws on all the senses, starts in infancy and continues throughout life. As Heft explains, learning about the material world and the formation of the attitudes and habits that govern our relationship to it is cumulative, socially conveyed and occurs through exploration.

Affordances are fugitive – they change along with physical changes to their material 'ground' and with changes to the intentions that a person brings to that ground. Those intentions are conditioned by prior individual experiences, as well as culturally shared views.

Conclusion

The above discussion may provide some insights into the relationship between design and consumption. The practice of Design can appear to seek to programme intentions into objects, to some extent through their materials. However, to succeed, it must necessarily work with the affordances that users of those objects are likely to perceive. I suggest these are subject to change with the cultural position of a particular consumer and in the case of plastics, with changes in the physical details of the object. Of course, plastics are not alone in this, changes in objects with age may be 'honorific' to use Veblen's (1961) term as McCracken (1988) has explained.

The recognition of affordances in everyday objects involves consumers interacting with objects in ways that might be taken to be the preserve of design professionals – we engage in reflective physical 'conversation' with objects that involves periods of reflection in and on this activity. This suggests that Design may have a relatively minor effect on experiences of the material world (Dant 2005: 140ff). It also suggests that like designers, as consumers we use our embodied perception to develop empathy with the materiality of objects.

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