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Design as communication: exploring the validity and utility of relating intention to interpretation

Nathan Crilly, David Good, Derek Matravers, P John Clarkson
University of Cambridge

The relationship between how designers intend products to be interpreted and how they are subsequently interpreted has often been represented as a process of communication. However, such representations are attacked for allegedly implying that designers' intended meanings are somehow 'contained' in products and that those meanings are passively received by consumers. Instead, critics argue that consumers actively construct their own meanings as they engage with products, and therefore that designers' intentions are not relevant to this process. In contrast, this article asserts the validity and utility of relating intention to interpretation by exploring the nature of that relationship in design practice and consumer response. Communicative perspectives on design are thereby defended and new avenues of empirical enquiry are proposed.

Keywords: aesthetics, communication, design models, interdisciplinarity, user-behaviour

As consumers engage with designed products, they form interpretations that influence how they think, feel and behave. At a basic level, such interpretations are based on form and functionality, whilst more complex responses include assessment of the values that products are seen to embody and judgments on the cultural associations that they evoke. Mindful that people attach such meanings to things, designers may form intentions that the products they design will be interpreted in particular ways and these intentions shape the products that result.¹ Whilst, to varying degrees, consumer interpretation may correspond with designer intent, interpretation may also differ from intention in many unanticipated ways. Irrespective of the degree of correspondence however, the existence of expressive intent and interpretative response has encouraged researchers to adopt a communicative perspective on design, and to represent products as communicative media. Such representations, whether verbal or diagrammatic, conceptualise designers and consumers as separated in space or time so that any correspondence between intention and interpretation must be attributed to the influence of the mediating artefact.

Although many authors across many design disciplines have viewed design as a communication process, this perspective is seldom the focus of their enquiry. Instead, analogies with communication are often drawn simply as a way to frame discussion of issues such as product interaction and user experience. Perhaps because of this,

the relationship between design and communication is seldom described in detail and the arguments that surround intention and interpretation have escaped critical scrutiny. Design researchers thus risk neglecting valuable conceptual developments made in other disciplines, and risk applying those developments to design in very limiting ways. By exploring the notion of 'design as communication' more generally (rather than as a perspective from which to describe some specific aspect of design), this article seeks to establish a stronger foundation from which the relationship between intention and interpretation might be approached (irrespective of what design discipline or research focus are of interest). This requires consideration of why and how design might be represented as communication, what criticisms such representations have attracted, and why, despite these criticisms, such representations are still valid and useful.

To properly explore the relationship between intention and interpretation reference must be made to the various fields of literature that illuminate the key issues. Therefore, in addition to theories of design, communication and media, discussion is informed by ideas from law, psychology, literary criticism, and the philosophy of art. By exploring and integrating material from these different sources, three particular arguments are considered and the article is correspondingly divided into three main sections. Firstly, justification is offered for representing design as communication. This involves defining communication in terms that include design, and considering those forms of communication to which design might best be compared. With the relationship between design and communication explicated, diagrammatic models that represent design as communication are presented. Secondly, attacks against these representations are reviewed. This involves acknowledging that consumers actively construct meaning as they engage with products and therefore that they are not passive recipients of some intended message. Thirdly, representations of design as communication are defended against the criticisms they attract. This involves demonstrating that relating intention to interpretation is useful when conceptualising both how designers attempt to influence interpretation, and how consumers infer designer intent. Finally, as the article is summarised, possible avenues of further work are discussed and conclusions are drawn.

1 Representing design as a communication process

Strong precedent for communicative perspectives on design can be found throughout the design of literature. Early prominent examples include works by Nelson (1957/1979), Eco (1968/1980: §C), Koenig² (1970/1974) and Pile (1979: C5), all of

whom describe design as communication.³ Whilst this article takes industrial design as its central concern, such ideas go back much further in architecture, where consideration of what buildings mean has preoccupied theorists since the emergence of the discipline (see Bonta, 1979; Whyte, 2006). Regardless of when such views first gained formal recognition, communicative perspectives on design have now been used to illustrate many design-related topics, and concepts of communication have become central to design studies (Buchanan, 1985a: 4; also see extensive reviews in Muller, 2001: 298-332; Bürdek, 2005: 230-239, 283-342). In particular, the relationship between intention and interpretation has proven to be a pervasive and recurring theme in design theory, practice and education.⁴ This is true, not just for industrial design and architecture, but also for a wide variety of design disciplines, including software (Andersen, 1990: 168-169; Salles *et al.*, 2001; de Souza, 2005), fashion (Barnard, 1996), graphics (Meggs, 1992; Barnard, 2005) and packaging (Bruce and Burrill, 1995; Underwood, 2003; Klimchuk and Krasovec, 2006: 33-34). Therefore, whilst the terms ‘product’ and ‘consumer’ are used throughout this article, the ideas extend to almost any designed artefact that is experienced by some stakeholder.

Across different design disciplines, the communicative potential of products has been categorised in various ways,⁵ and at least five different perspectives are evident in the research literature. Firstly, the product has been viewed as employing a language that consumers read; rules of grammar or syntax are then applied (Gros, 1984; Giard, 1989: b2; Rheinfrank and Evenson, 1996: 68). Secondly, the product has been considered as part of a sign system with which consumers construct meaning; semiotic theories of interpretation are then applied (Mick, 1986; Holbrook and Hirschman, 1993; Vihma, 1995; 1997). Thirdly, the product has been considered as an instrument of persuasion or argument; rhetorical perspectives are then applied (Buchanan, 1985a; Berman, 1999: 19; 2001). Fourthly, the product has been viewed as one component of social interaction; concepts of system theory are then applied (Jonas, 1993; 1994). Finally, the product has been considered as the message or medium in a sender-receiver process; models of the communication process are then applied. This article focuses on the last of these perspectives, and might therefore be considered as examining what the ‘process school’ of communication offers design thinking (see Fiske, 1990: 2).

The various perspectives outlined above have often been presented in terms that suggest they compete with one another. Adherents of each view have attacked the

alternatives for failing to adequately represent aspects of the situation to which they are not suited, and for implying conceptions which might be inferred but are not necessarily implied. Such competition between the different perspectives is misleading, because they are actually complementary rather than contradictory; each one simply emphasises a different aspect of the situation, and a plurality of approaches is beneficial (Buchanan, 1985b: 73-74). For example, amongst communication theorists who distinguish between a semiotic and process view, it is acknowledged that each of these traditions is well suited to examine communication from a given perspective but that to fully explore the problem both traditions must be combined (Fiske, 1990: 4, 190; Barnard, 2001: 29, 39, 196).⁶ As such, this article does not argue against the application of any particular communicative perspective to design, but simply examines the conceptual foundations of the process view, and the validity and utility of applying that view to design. In doing so, a complete exploration of the various communicative perspectives on design cannot be provided, but it is hoped that those seeking integration of the different perspectives will be aided by the provision of a detailed account of this one. To set out the basis of this account, we need to first establish what justification there is for representing design as a communication process, and to then establish what forms such representations take.

1.1 The nature and variety of communication and design

Broad definitions of communication emphasise the sharing and exchange of information or experiences in a way that relates one party to another:

“communication [...] is essentially the *relationship* set up by the transmission of stimuli and the evocation of responses” (Cherry, 1978: 7). Whether those stimuli are utterances, actions or artefacts, for them to be regarded as communicative, it is often considered necessary that they be the product of communicative intention. For example, Anderson and Meyer (1988: 19-20) insist that human communication is identified by the *intent* to achieve meaning and Berlo (1960: 16) argues that the *purpose* of all communication is to elicit a specific response. In this sense, communication scholars have considered art and other creative practices to be communicative because “‘art’ is ‘the attempt to structure certain elements in a way that will best express our purpose’ or ‘have the most effect on the receiver’ or ‘have the intended meaning for the receiver’” (Berlo, 1960: 59).⁷ Such intentions are also relevant to design practices where designers want to control the psychological and behavioural effects of the design decisions that they make (Zeisel, 1984: 34). In these terms, such practices may be considered, quite literally, as communicative acts

because they involve the intentional evocation of thoughts, feelings, experiences or actions.

In the design of mass-produced products, designers can only ever have direct contact with a small number of consumers drawn from the population for whom they design. Once manufactured, and released to the marketplace, the product exists independently of the designer and is beyond their control (Draper, 1994: 63). As such, design is usefully viewed as a process of *mediated communication*, where any intentions that the designer has for how a product should be interpreted inform the production of a mediating artefact that is presented to the consumer. The consumer must then interpret the product without direct access to the designer or their intentions, and therefore negotiated clarifications of meaning are not possible.⁸ In this sense, Anderson and Meyer's (1988: 42) description of mediated communication is also descriptive of design:

Because individuals as receivers of mediated content do not have the ability to confirm meanings [...] by testing those meanings in the mediated communication process, there is no mechanism by which an audience member can accomplish a shared understanding with the production community.

Although the separation of production from consumption typifies both mediated communication and design, the notion that designed artefacts are communicative media is perhaps more intuitively applicable to some design activities than to others. For example, in the fields of information design or graphic design, there is often an explicit communicative objective and one of the designers' primary goals may be to produce artefacts that inform or instruct others.⁹ Conventional symbols and letterforms can be used to achieve these objectives, and a good correspondence between intention and interpretation might be considered a requirement for design success. However, not all communication employs conventional symbols (Lyons, 1977: 32), and design acts can be regarded as communicative even if they do not equate to the construction of verbal utterances (Buchanan, 1985a: 4; 1992: 9-10; 2001: 201). For example, in disciplines such as industrial design and architecture, the use of words or images are not of central importance, and designers may be restricted to communicating about the products they design, or the relationship between those products and others of the same kind (Gibbs, 1999: 53). Nevertheless, even if the category to which the product belongs determines what that product is seen to express, it can still be designed with the intention of eliciting a certain response (Crilly, 2005: 121-130). Therefore, such products may be treated as communicative

media even though the product type is likely to be regarded as meaningful in its own right, and separating the medium from the message may be impossible (Jonas, 1993: 167; Crampton Smith and Tabor, 1996: 43-44; Dant, 1999: 154; Zettl, 1999: 10-11).¹⁰

Designed products are often intended to satisfy or stimulate the demands of large consumer groups, and design may thus be considered not just as a process of mediated communication, but as a form of *mass media*. Here, the term 'mass' (whether applied to audiences or consumers) indicates any large group that is widely dispersed and whose members do not have a direct relationship to each other or to those who communicate with them (McQuail, 2000: 41-42). In this sense, we can draw an analogy between the work of industrial designers and print journalists (Gros, 1984: 10; but see Krippendorff and Butter, 1984: 5) because they both exploit high-volume processes to communicate with large audiences (de Fusco, 1967: 61; Koenig, 1974: 104). Long before the advent of mass production, buildings were already being experienced by large audiences, and it is consequently within the field of architecture that the relationship between design and mass communication has received the most attention (see reviews by Krampen, 1979: 26-27; Dreyer, 1997). For example, Colomina (1994: 13-14) explicitly considers buildings to be a form of mass media, saying: "the building should be understood in the same terms as drawings, photographs, writing, films and advertisements [...] because the building is a mechanism of representation in its own right". More generally, Eco lists several characteristics that designed artefacts and mass media typically exhibit: they seek mass appeal, they are persuasive, they are experienced inattentively in everyday life, they can be unknowingly reinterpreted and they are ultimately a form of business (Eco, 1968/1980: 41-42).

Despite recognition that products are an example of mass media, the design literature seldom makes explicit reference to theories or models of mass communication.¹¹ This is unfortunate, because by adopting or adapting more basic conceptions of communication to represent design, design theorists have failed to exploit the work of those communication scholars whose work is most relevant. Instead, they have typically focussed on the earliest classic models of communication, models that attract ardent criticism when used as a foundation for design thinking and that need considerable reworking to represent design. Before dealing with such criticisms, we must first turn our attention to the models themselves, those that represent communication and those that represent design.

1.2 Diagrammatic models of communication and design

To frame their ideas about communication, many scholars have developed diagrammatic models that represent the relationship between the message as intended, and the message as interpreted. There are many such communication models available in the literature and an exhaustive review here is neither possible nor necessary. Instead, we restrict ourselves to a few examples, giving particular consideration to those that have been used as the foundation upon which design models have been built, or those that might usefully provide such foundations. In particular, Shannon's (1948) model of information transmission has been highly influential in design theory, either directly, or through its more general influence on how communication is conceived.¹² Criticisms of Shannon's model have also been extended to many models of human communication and design, even where such models are only similar in superficial ways. Therefore, to understand these arguments, and the defences that can be offered against them, it is necessary to review the origins and development of Shannon's model here first, before considering those models that followed.

In 1948, Claude Elwood Shannon published 'A mathematical theory of communication' in the *Bell System Technical Journal* (reprinted in Shannon, 1993). Despite its technical title and origins, we are not concerned here with the mathematical detail of Shannon's theory, but rather, with his diagram of a general communication system. Shannon represented a basic system of communication as comprising five essential elements: information source, transmitter, channel, receiver and destination. The information source produces a message which is encoded into a signal and transmitted across a channel; the receiver decodes the signal and a message arrives at the destination; a noise source acting on the channel may disrupt the signal (see Figure 1a).¹³ In developing this model, Shannon was concerned with the engineering of communication systems and his focus was on the transmission of information rather than on issues of intention or interpretation. However, in 1949, Shannon collaborated with Warren Weaver in producing an extended and more accessible text (Shannon and Weaver, 1949). Weaver's treatment of Shannon's model reflected his wider interest in communication, which he defined as "all the procedures by which one mind may affect another" (Weaver, 1949: 95). Within this broad scope, Weaver included the pictorial arts and other aspects of human behaviour, citing aesthetic response as a form of communicative effect. Although Weaver was convinced of the general applicability of Shannon's model, he

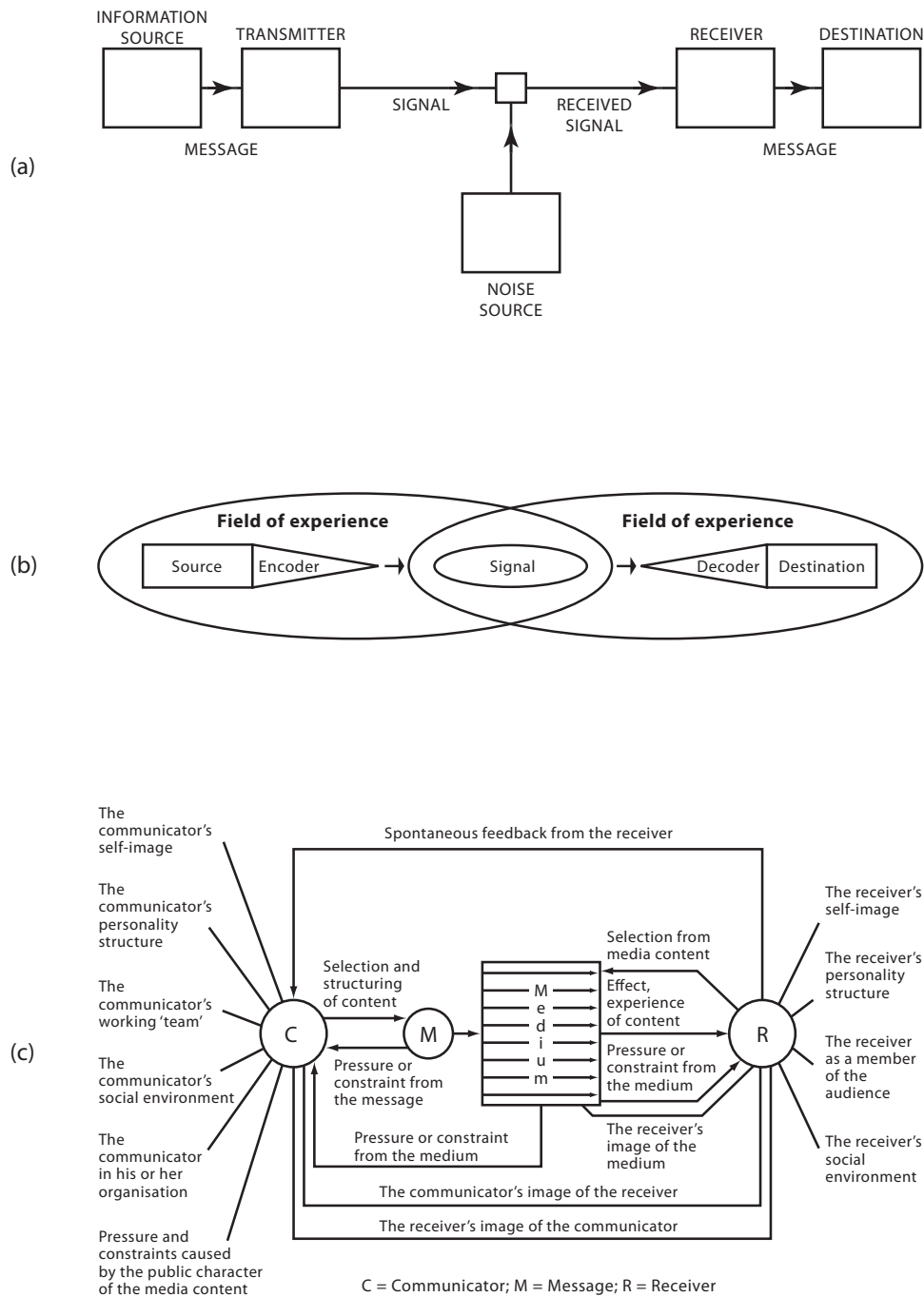


Figure 1: Selection of three communication models: (a) Shannon (1948/1993: 7); (b) Schramm (1961: 6); (c) Maletzke (1963/1981: 14), reproduced here from a translation and elaboration provided by Watson and Hill (2000: 175)

acknowledged that some amendments would be required to accommodate the issue of semantics in human communication (*Ibid.*: 115).¹⁴

As Shannon's model has been adapted by those interested in human communication, attention has turned to factors that influence how messages are interpreted. For example, in Wilbur Schramm's (1961: 6) general introduction to the communication process, he developed a sequence of models to specifically represent human communication. Starting with a diagram like Shannon's, Schramm considered the source and transmitter as one person and the receiver and destination as another.¹⁵ Schramm then represented each individual as operating within their own field of experience and suggested that communication is only possible where the message resides in the areas of overlap between those experiences (see Figure 1b).¹⁶ An emphasis on characterising the individuals involved in communication is also found in many other models of the communication process, including Gerhard Maletzke's (1963/1981: 14) model of the mass media. Maletzke considers many other factors besides, and consequently produces one of the more comprehensive and sophisticated models available in the literature. In particular, he includes two influences on intention and interpretation that are relevant to design but are typically absent from communication-based models of design. Firstly, each party is represented as having an awareness of their role in the process of communication, and an awareness of their relationship to each other. Secondly, a distinction is made between content and media, and each party's actions may be influenced by one or the other, or by the interaction between the two (see Figure 1c). This model, when compared to those by Shannon and Schramm, demonstrates something of the variety of process models that exist, but many more have been developed, with each one emphasising different factors that influence the construction and interpretation of communicative artefacts.¹⁷

When design theorists have adopted a communicative perspective on design, they have often developed diagrammatic representations that help to frame their conceptualisation of the subject. These are often structurally similar to the existing communication models, but include various features that are specifically suited to representations of design. That said, they typically do not depict the processes of design or consumption in detail;¹⁸ instead, they represent the basic relationship between intention and interpretation, and highlight the different factors that influence each. Again, there are many such representations available in the literature,

and we will restrict ourselves here to presenting a few examples that demonstrate both the similarity and variety that the models exhibit.

In an early design-specific communication model, Maser (1976: 42) sets out a basic designer-product-user structure and then characterises those factors that influence the creation of the product and its interpretation (see Figures 2a). Krippendorff and Butter (1984: 6) adopt a similar structure, but also depict the feedback that designers get from their users, and the feedback that users get from manipulating both the product and the context within which it is situated (see Figures 2b). Whilst these models represent design as communication, they make no reference to the communication models that precede them. In contrast, Monö (1997: 43-45) explicitly developed Shannon's model into a representation specific to design, giving particular consideration to factors such as manufacturing quality and marketplace competition (see Figure 2c). Beyond industrial design, many other design theorists have developed communication-based representations, including those from the fields of architecture (Broadbent, 1973: 210; 1980: 209), human-computer interaction (de Souza, 1993: 88; Salles *et al.*, 2001: 457; 2005: 88), typography (Swann, 1991) and information or graphic design (Waller, 1979; Kroehl, 1987; Shedroff, 1999: 271; Curran, 2004: 23). In addition to such domain-specific models, there are also those that focus on more domain-independent issues, including usability (Norman, 1986/1988: 190), aesthetics (Coates, 2003: 120), branding (Karjalainen, 2004), consumer response (Crilly *et al.*, 2004) and manufacturing quality (Forslund *et al.*, 2006: 715). In each case, different influences on intention and interpretation are emphasised depending on the unique characteristics of the domain or the authors' focus of enquiry.

Whatever their conceptual origins or field of application, the models discussed above help to organise existing ideas into some basic structure, with that structure then being used to explore new ideas (Deutsch, 1952: 360-361). The models are therefore not just a way that their authors have chosen to convey their subject to others, but are instrumental to how that subject has been conceptualised and defined. In this sense, the models are also seen to reveal their authors' judgements on the relative importance of those aspects that have been emphasised,¹⁹ and have consequently been attacked for oversimplifying the phenomena they seek to represent. With some example models now presented, we can turn our attention to such attacks before considering some of the different ways in which the models can be defended.

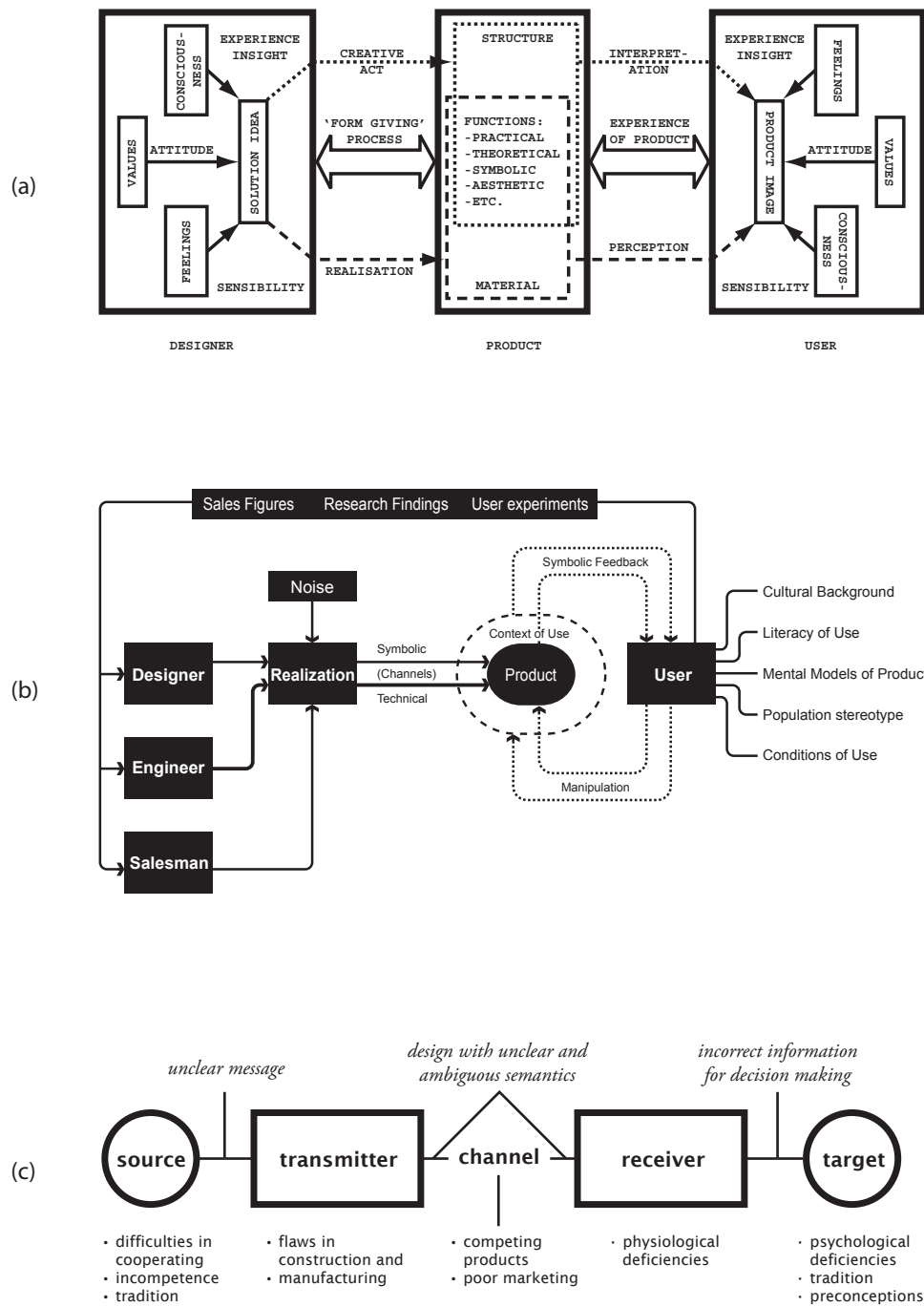


Figure 2: Selection of three design-specific communication models: (a) Maser (1976: 42), translated from German; (b) Krippendorff and Butter (1984: 6; also see Krippendorff, 1989b: 15); (c) Monö (1997: 45)

2 *Attacking 'design as communication'*

Although the process view of communication dominated communication theory for many years, it has also been attacked for offering an inappropriate framework for studying human communication. Such criticisms revolve around two arguments about meaning that are closely related but originate from different perspectives. Firstly, the models are attacked for allegedly implying that meaning is contained in messages rather than being constructed by people. Secondly, they are attacked for allegedly implying that the originator of the message has authority over what the meaning of that message should be. If design is to be conceptualised as human communication mediated by products, then these arguments against the models as a representation of human communication are also relevant to representations of design. These arguments are discussed here as *the problem of containment* and *the problem of authorship* before counter-arguments are offered and the models are defended.

2.1 *The problem of containment*

Representations of communication as a linear process are criticised for allegedly implying that meaning is contained within messages that can be sent from one party to another. Instead, critics claim that meaning is actively constructed by people and that there is no necessary correspondence between intent and response (Cherry, 1978: 9; Reddy, 1979). As such, Budd and Ruben (1988: 54) describe Shannon's model as unjustifiably influential and blame it for deluding scholars into believing that messages have an objective content or meaning. More generally, Eco rejects the basic sender-message-receiver models arguing that "what one calls a message is usually a *text*, that is, a network of different messages depending on different codes and working at different levels of signification" (Eco, 1979: 5; also see Eco, 1976: 141). Consequently, different people will construct different meanings from the same message depending on their experiences, values, motivations and capabilities. By considering the communication process in these terms, the media theorist Ien Ang (1996) argues that it is not the absence but the existence of shared meaning which needs to be accounted for:

If meaning is not an inherent property of the message, then the Sender is no longer the sole creator of meaning. If the Sender's intended message doesn't 'get across', this is not a 'failure in communications' resulting from unfortunate 'noise' or the Receiver's misinterpretation or misunderstanding, but because the Receiver's active participation in the

construction of meaning doesn't take place in the same ritual order as the Sender's. (*Ibid.*: 167)

These arguments against the containment of meaning can also be found in the design literature. For example, Krippendorff (2006) has argued that because meaning does not reside in products (*Ibid.*: 141, 230) there is no necessary correspondence between intent and response (*Ibid.*: 54).²⁰ Precedent for this view includes Krippendorff's (1989a: 161) earlier suggestion that "no one can presume that form (the designer's objectified meaning) and (the user's) meaning are the same", and Julier's (2000: 94) assertion that "there is always the danger of slippage between the meanings the producer intends and those which the consumer interprets". Moving from these general arguments to consider the communication models specifically, design theorists have objected to the process models, claiming that their strict left-to-right progression fails to account for how consumers actively approach products with their own motivations and experiences (Waller, 1979; Frascara, 1997: 17).²¹ Commenting on Shannon's model in particular, Barnard (2005: 20-23) has further argued that the notion of noise disturbing the message is too mechanistic to represent how consumers construct meanings that differ from those intended by designers.

Consumers do not passively receive some meaning contained within the product, but actively construct meaning as they engage with that product within a given context (Siu, 2003: 66). In many cases, this context is culturally, geographically and temporally removed from the context in which the product was conceived (Brown and Duguid, 1994: 5-6), and any single product may be encountered by many different stakeholders (Barnard, 1996: 70-77; Krippendorff, 2006: 63-65). For these reasons and others, there may be a completely different relationship between the consumer and the product from that which was anticipated by designers (Friendlaender, 1984: 14-15; Whitehouse, 1999: 105; Hsu *et al.*, 2000; Chamorro-Koc *et al.*, 2008). This may result in products being interpreted and used in unanticipated ways, with those products 'acquiring' significance and functionality that had not been intended (see reviews in Redström, 2006; Ingram *et al.*, 2007).²² This has important implications for design, because these new interpretations may suggest useful feature changes, different marketing claims or entirely new product categories (von Hippel, 2005).

2.2 *The problem of authorship*

If meaning is not contained in products and consumers can interpret products without access to the designer, then designers' intentions do not have any authority

over the interpretations of the consumer. Furthermore, designers operate under organisational, technical, financial and legislative constraints, all of which prevent products from being designed or produced, in ways that directly correspond with the original intentions (Crilly, 2005: 127-130; Whyte, 2006: 169). We might therefore question the relevance of relating intentions to interpretations if designers are not free to translate their intentions directly into product features and if those features do not contain meanings that consumers can extract. Whilst issues of this kind have been considered within the field of design, they have precedence in literary theory where there is a strong tradition of analysing the notion of authorial intent. A brief introduction to this tradition is provided here first so that its influence on design theory can be understood.

The literary critic I. A. Richards (2001: 163) describes writing as an essentially communicative act that is reliant upon past similarities in experience between the writer as the source of the message, and the reader as its recipient. Therefore, although Richards acknowledges that artists seldom consider themselves to be communicators, he argues that this is the most profitable way to consider their actions and outputs (*Ibid.*: 26). In this sense, traditional literary criticism regarded the author's declared or assumed intention for writing a work as the proper basis for deciding upon that work's value and meaning. However, it has more recently been argued that this approach is fallacious and that "the design or intention of the author is neither available nor desirable as a standard for judging the success of a work of literary art" (Wimsatt and Beardsley, 1946/1972: 334). Such views led Roland Barthes (1967/1977) to advocate 'the death of the author' as an authoritative figure and to celebrate the rise of the reader as the ultimate interpreter of a creative work. Whilst this perspective has not been universally embraced, it continues to raise issues which inform and provoke critical debate.²³

These theories of criticism view intention as an inaccessible, unreliable or incomplete foundation for assessing the value of creative works and their potential relevance to designed products has not gone unnoticed.²⁴ Most explicitly, in his essay, *The death of the designer*, Richardson (1993) considers designers to have suffered a fall from authorial control and thus emphasises the consumers' free interpretation of the product. He argues that:

The newly invigorated user "reads" the form and function of a product using an interpretation that is independent of the one the designer intended. As with text, there is obviously considerable congruence, but the interpretation remains individual nonetheless. (*Ibid.*: 36)

Lloyd and Snelders (2003) also echo literary theory's New Criticism when they too consider the 'death of the designer' and question whether products can reliably reveal anything about their designers' intentions. That a product exists, they argue, tells us more about its consumers and the identity they wish to appropriate than it reveals about the original intentions of the designer (*Ibid.*: 244).²⁵ Such considerations might be seen to reflect a general trend in which the authority for legitimately defining what products mean has shifted from producers to consumers (Abercrombie, 1994). However, beyond the preferences of individuals, the success and survival of products in the marketplace is also determined by the complex interplay of economic, cultural and political factors (Molotch, 2003). In this sense, Forty (1986: 245) argues that to properly understand what design is, attention must be turned away from designers' intentions, and towards the contexts in which products are produced and consumed.

There is evidently a great deal of similarity between those arguments against the transmission of meaning and those against the authority of intention. Whilst the former emphasise that there is no necessary correspondence between intention and interpretation, the latter question the very relevance of that intention when a corresponding interpretation cannot be assumed. Such notions have sometimes prompted design theorists to reject the process view of communication in favour of other communicative perspectives on design, including those briefly outlined at the start of this article. Whilst these other perspectives all usefully reveal different facets of design, they do not emphasise the relationship between intention and interpretation because their focus lies elsewhere. By asserting the relevance of representing that relationship, the following sections defend the communication-based models of design and discuss some phenomena that such models help to conceptualise.

3 Defending 'design as communication'

It is clear from the arguments reviewed above that meaning is not contained in communicative media and that the interpretation of the 'receiver' may differ from that intended by the 'source'. In fact, examining the original texts that introduced the communication models reveals that their authors never claimed otherwise. Accusations that such models imply the passive reception of transmitted meanings are unfounded because the representation of cultural contexts and personal characteristics are attempts to account for how interpretations vary between (and within) individuals and groups. For example, the arguments reviewed above cannot persuasively be applied to models such as Maletzke's, or to many of the design-

specific communication models that have been developed. However, this appears to have been largely ignored by the critics as the perceived shortcomings of Shannon's model (as a representation of human communication) have been used to generally dismiss the process models as a foundation for design thinking. Consequently, many potentially useful representations of communication and design risk being overlooked because they superficially share the same basic structure as Shannon's model, a model that was not, in any case, originally intended to represent human issues.²⁶

Rather than implying that meanings are contained in messages, or that intent determines response, representing the relationship between intention and interpretation emphasises the possibility – or inevitability – of divergence. If intention and interpretation were assumed to correspond then there would be no need to represent both; it is the very independence of intention and interpretation that makes representing the relationship between them a useful enterprise.²⁷

However, although interpretation need not correspond with intention this does not mean that they must differ wildly from each other, and designers and consumers may both behave as though a good degree of correspondence is both possible and likely. Therefore, representations of the relationship between intention and interpretation can be used to conceptualise instances in which one involves consideration of the other. In particular, there are two distinct phenomena of that kind that can be framed and investigated with the help of communication-based models. Firstly, designers are motivated to constrain, or otherwise influence consumer interpretation of products. Secondly, consumer interpretation of products can involve some inference of what the designers' intentions might have been. Both of these points are now elaborated in turn, with each one suggesting a different productive reason to represent design as communication.

3.1 Influencing consumer interpretation

Although the interpretation of any given artefact cannot be fully predicted, in any given population, some interpretations are more likely or prevalent than others. Consequently, in many fields of communication, achieving a good degree of correspondence between intent and interpretation is so common that it normally fails to elicit comment. In part, this is due to the efforts of communicators who carefully craft artefacts in the hope that those who interpret them will construct the intended meanings, whether those intentions are narrowly or broadly defined. This is true also in design, where designers often successfully intend consumers to recognise that a

product is an instance of a certain type, that it performs certain functions and that it possesses certain qualities. In some instances these intentions may only be broadly defined, and interpretations that deviate from them may not just be accepted, but may be celebrated and exploited (von Hippel, 2005; also see von Hippel, 1998: C2, C8). However, there are other instances in which interpretations that differ from those that are intended may compromise the satisfaction of commercial interests or the safe operation of the product (Krippendorff, 2006: 87, 231). In these instances designers must actively attempt to predictably influence consumer interpretation, and anticipating those factors that might lead to problematic interpretations is an important part of that process.

Commercial design practice may be distinguished from more purely artistic pursuits because the designer's role is often that of an intermediary, acting on behalf of those who commission design whilst considering those to whom it is directed. As such, the designer may not be the originator of the message, but might instead translate certain requirements into a plan that can be realised. For example, in industrial design, one of the designers' main responsibilities is to invest the product with certain qualities that are seen to be representative of the brand (Karjalainen, 2004).²⁸ When the designer is responsible for conveying the brand identity through the product, then their intentions, and the extent to which these intentions are realised, are of great interest. There is some preferred interpretation that attracts institutional support and significant deviation from this interpretation can be commercially damaging. Therefore, from the perspective of the designer (and the brand owners) the various interpretations that lie outside intention are potentially problematic.²⁹ In this sense, Kazmierczak (2003) claims that the effectiveness of a design is defined by the degree of correspondence between the intentions of designers and the interpretations of consumers:

The more strategically successful the design is, the more accurately and consistently does it trigger similar thoughts in different receivers. These thoughts, in turn, cause the receiver to respond to a design in a certain way, and thus define its effectiveness (*Ibid.*: 48).

With respect to product safety, it is important for designers to anticipate how their work might be interpreted because it is interpretation rather than intention that determines product use. As such, product liability laws may subject products to a 'consumer expectation test' to determine whether injuries incurred by a plaintiff result from a design defect. Such tests seek to establish whether the consumer might reasonably have expected the product to be safe for the use to which they put it, and

producers may be held liable where injurious use of the product should have been anticipated, whether or not that use was intended (Howells, 2000: C4; Miller and Goldberg, 2004: C11).³⁰ In this context, product usage includes tampering, modification, installation and maintenance by third parties, in addition to actions by the injured party (Miller and Goldberg, 2004: §11.55-11.61). What consumers and other stakeholders might reasonably and foreseeably do with a product depends not only on the product itself, but also on how it is promoted, any official marks that it carries and any instructions or warnings that are associated with it (Howells, 2000: §4.135-4.140).³¹ All these factors contribute to what possible interpretations of the product consumers might reasonably arrive at and what interpretations designers might reasonably foresee. There is therefore a legal imperative for designers to anticipate the variety of ways in which products might be interpreted and to make reasonable efforts to constrain those interpretations within safe bounds.

Even if design-specific communication models do not fully account for the processes of design and consumption, they can represent the different factors that influence those processes. Those looking to predict or constrain interpretation might therefore use such models to conceptualise the ways in which intentions are formed, the way in which those intentions influence products, and the ways in which those products are experienced by consumers. This is important, not just for organising and performing design activities, but also for communicating with other stakeholders, especially those who influence the design process. For example, Armstrong (2000) suggests that designers often speak of ‘design as communication’ in terms which suggest that what is communicated is initially defined verbally and then translated into forms that consumers read. He argues that this has the advantage of representing design as a rational activity, to persuade or reassure design managers who do not share the designers’ training or sensibilities (also see Tomes *et al.*, 1998: 141).³² In these terms, representing the relationship between intention and interpretation provides a conceptual frame within which potential problems of interpretation can be both identified and expressed.

3.2 *Inferring designer intention*

The philosopher William E. Tolhurst claimed that “in understanding an utterance one constructs a hypothesis as to the intention which that utterance is best viewed as fulfilling” (Tolhurst, 1979: 13). In this sense, an academic interest in the notion of intent does not necessarily imply that it is the *actual* intentions of the creator that are being considered. Instead, attention might be turned to those aspects of

interpretation that involve some inference of the creators' intention. In art theory, this inference is considered to be almost unavoidable where viewers are puzzled by some incongruent detail of the work. Here, as the effect of the communication breaks down, the viewer becomes more aware of the medium used and they attempt to reason out the intentions that lie behind its production (Kuhns, 1960: 12-13). Similarly, what consumers take products to mean can involve some inference of what designers intended them to mean (van Rompay, 2008: 342), and these inferences can assist consumers in determining what a product is, how it should be used and how it should be regarded.

In studying how objects are named and categorised, developmental psychologists have proposed that whilst for young children current usage defines object type, for adults, it is the inference of design intent that is most influential (German and Johnson, 2002; Gutheil *et al.*, 2004). Taking the chair as an example, Paul Bloom claims that "our understanding of the concept *chair* is that it includes all and only those entities that have been successfully created with the intention that they belong to the same kind as current and previous chairs" (Bloom, 1996: 10).³³ Bloom is not arguing here that the form and function of artefacts are ignored in categorisation, but that current appearance and usage are only relevant because they offer reliable cues to the artefact's *intended* function.³⁴ Therefore, an artefact's conformity to convention (or its prototypicality) only aids us in determining its type because it allows us to infer that it was intentionally created to be a member of the same type as the group to which it conforms:

[we] possess knowledge about chairs, what they typically look like and how they are typically used, and we can use this knowledge – along with our notions about the relationship between intention and product – to infer whether a novel entity was intended to be a chair³⁵ (*Ibid.*: 10-11)

Reasoning about intentions can allow consumers not just to categorise products, but to develop an understanding of how those products should be used. By adopting what the philosopher, Daniel Dennett (1987: 17) terms 'the design stance', people can conceptualise the operation of products and interact with them more efficiently. Here, rather than trying to understand how some system actually works, consumers simply predict that it will behave *as it is designed to behave*, and therefore the inference of design intent aids comprehension of the system. Taking software as an example, Dennett claims that if a user can develop a good idea of what a system *is designed to do*, they can reliably predict that system's behaviour without understanding how it works (also see Dennett, 1971: 87-88; Dennett, 1990). Of

course, adopting the design stance only helps users to predict the designed behaviour of a system; where that system is treated in ways for which it was not designed, or is in some state that was not intended, then predictions of intended behaviour are unlikely to usefully guide action. In such instances users may need to revert to their understanding of how some system is actually constituted (or how it physically operates), but otherwise, inferring design intent can effectively permit a simpler mode of interaction.³⁶

Considering the inference of intent naturally leads to considering two issues of recursion: communicators *can intend* that their intentions be inferred, and interpreters can infer that the communicators' intentions *were intended* to be inferred (and so on). The possibility of the first permits the occurrence of the second, and the occurrence of the second inevitably influences how an artefact is regarded. This relates to Paul Grice's (1967) concept of meaning, where he claims that "A meant something by *x*' is roughly equivalent to 'A uttered *x* with the intention of inducing a belief by means of the recognition of this intention'" (*Ibid.*: 45; also see Searle, 1969: 43; Ricoeur, 1981: 151; Sperber and Wilson, 1986:9). With respect to design, this suggests that designers might not just intend products to be interpreted in certain ways, but might also intend that consumers recognise that intention. This is especially relevant in 'high design', where self-referential or humorous works are targeted at the design-literate consumer. Such consumers, interpret products with the expectation that they were meant to be interpreted (Kazmierczak, 2003: 54), and they not only infer that intentions were intended to be recognized, but also make judgements on how those intentions were formed and why recognition of them was intended (see Rushkoff, 2000: 200, 208-212).

Just as interpretations can be expected to differ from intentions, so can inferred intentions be expected to differ from actual intentions.³⁷ In any case, even the accurate inference of intention might actively lead to the construction of divergent meaning if those inferences negate the possibility of agreement. For example, Bonta claims that "an architecture interpreted as intended to be meaningless – would mean the desire to be meaningless, and thus it could not actually be meaningless" (Bonta, 1979: 22).³⁸ Whatever the accuracy of the inferred intentions, and whatever effect these inferences have, they are central to how people experience utterances, actions and artefacts because the attribution of intention makes these things meaningful (Gibbs, 1999). Consumer inference of design intent influences the interpretation of meaning in this general sense (how something is regarded), but also influences

judgements of product functionality and type. From this perspective, the communication models and their design-specific derivatives might be considered as representations of the consumers' conception of their place in the consumption process. This suggests that the models can be read from right to left (rather than left to right): as consumers engage with products they may construct a notional designer to whom they attribute the intentions of which the product is a result.³⁹

As illustrated above, designers may attempt to influence consumer interpretation, and consumers may infer designer intent. In both circumstances each party holds an image of the other, and also holds some image of their own place within a communication process mediated by the product. Therefore, representing that process is valuable because it assists us in thinking about design phenomena that would otherwise be difficult to conceptualise. We should not dismiss these representations because of some confusion over what they imply or entail. They clearly need not be read as suggesting that meaning is contained in products or that designers enjoy the privilege of determining what those meanings are. On the contrary, the very purpose of representing the relationship between intention and interpretation is often to highlight that products are interpreted in different ways by different people in different contexts. Such representations may either be an input to research (as they suggest what issues might be investigated) or form the output of research (as they are used to frame new findings). Whichever of these functions is of interest, the two defences offered in this section suggest a number of possible research directions that could usefully expand knowledge about how intention and interpretation are related. In the discussion that follows, a brief summary of the article is offered before examples of such possible future work are proposed and conclusions are drawn.

4 Discussion

In adopting the perspective that products mediate between designers' intentions and consumers' interpretations, this article has aligned itself with one particular communicative perspective: the process view. As acknowledged earlier, several other perspectives are also valid, with each one emphasising different aspects of the situation. However, this article has not argued for the superiority of the process view, but rather has attempted to elaborate the conceptual foundations of that perspective and to defend it against some of the criticisms that it attracts. To achieve this, the article was divided into three main sections with each one covering a different aspect of the problem. Firstly, we examined what justification there is for representing

design as communication, and examined what those representations emphasise. Secondly, we reviewed arguments that are used to attack those representations as an inappropriate foundation for design thinking. Thirdly, by considering their application to particular aspects of design practice and consumer behaviour, the representations were defended as valuable conceptual tools.

Whilst communicative perspectives on design can be used to frame many interesting research questions, the arguments offered in this article suggest two particular directions in which research might proceed. The first relates to how designers might influence consumer interpretation; the second relates to how consumers might infer designer intent. With respect to influencing consumer interpretation, researchers might ask: *What determines the level of correspondence between designer intent and consumer response? How are intentions defined and to what extent are intentions preserved during processes of design, manufacture and retail? How do interpretations change between different populations, between different people in the same population, and for the same person in different contexts?* With respect to the inference of design intent, researchers might ask: *How do consumers conceive of the design activities from which products result? How readily do they infer designer intent, how accurate are these inferences and what effect do these inferences have on consumer experience? What factors influence whether intentions are inferred and what the effect of such inferences is?* To effectively answer such questions researchers might adopt a variety of approaches, mixing well-controlled experimental studies with more ecologically valid field investigations. This might be done in a number of disconnected, highly focussed studies, or in a set of integrated longitudinal studies that track the interpretation of particular products as they are commissioned, designed, manufactured, promoted, purchased, used and retired. Such studies have the potential to offer empirically derived insights that are specifically related to design. This would significantly strengthen a research area that has remained predominantly theoretical and is also largely based on ideas derived from other disciplines.

Like all representations, diagrams that depict products as communicative media emphasise certain aspects of the situation at the expense of de-emphasising others. For example, they often do little to illustrate the mechanisms by which consumers construct meaning with products, or the part that consumers may play in a participatory design process. Instead, they simply represent the role of the product in mediating the relationship between intention and interpretation, and thus provide a framework within which issues of context and process can be considered. Where

other aspects of design are the focus of enquiry, additional or alternative representations should be adopted or developed to overcome the limitations of the process models. However, because relating intention to interpretation frames various issues in many of the sub-disciplines that comprise design there is benefit in exploring the conceptual foundations of that relationship. This present article has sought to contribute to such exploration by asserting the validity of relating intention to interpretation, and by demonstrating that representing 'design as communication' is conceptually useful.

Credits

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Notes

¹ Throughout the rest of this article, the words 'intention' and 'intent' are used in this restricted sense to denote the communicative intention to elicit a response. Conversely, 'meaning' is used in a quite unrestricted sense, to include interpretations of form, function and value, however they might be experienced. 'Interpretation' is generally used in preference to 'experience' to allow greater continuity when moving between different disciplines that typically discuss *the interpretation* of utterances, actions, artworks and other artefacts.

² For brief English language summaries of Koenig's work see Broadbent (1980: 208-209) and Krampen (1979: 23).

³ In addition to Nelson's chapter heading, the term 'design as communication' has precedence in Minai's (1984: §III-9) book section heading, the titles of Draper's (1994) journal article and Norman's (2004) online essay, and in the text of many other works referred to here (in particular, see Minai, 1989; O' Gorman and McGrath, 1998). Whilst Eco refers to 'architecture as communication', he explicitly defines 'architecture' in a way that broadly encompasses design (1968: 191; 1980: 11).

⁴ Much of the literature referred to throughout this article takes the relationship between intention and interpretation (and the representation of that relationship) as its central concern. This subject gained particular prominence during the 1980s within the 'product semantics' movement (see special issues of *Innovation* (1984, 3:2) and *Design Issues* (1989, 5:2)), a movement that is often associated with work from the Philips Corporation (Blaich, 1989) and the design department of Cranbrook Academy of Art at that time (McCoy and McCoy, 1990). However, there are many instances of communicative perspectives on design having influenced more general design thinking (for example, see Lawson, 1980: 127; Cross, 1982: 225; Lazzari, 1990: 177; Mullet and Sano, 1995; Macdonald, 1998: 180; Warell, 2001: 48; Demirbilek and Sener, 2003: 1348; Krauss, 2005; Redström, 2006: 125-126). See Marzano (1999: 53) and 'various authors' (2006) for comments on design practice. See Waller (1979), McCoy and McCoy (1990) and Langrish and Lin (1992) for comments on design education.

⁵ As Buchanan observed, "there seems to be little question that some kind of communication exists in designed objects. [...] The significant question, however, is what the nature of such communication is" (Buchanan, 1985a: 18-19). In this sense, Cauduro (1990: 392-393), Byrne (1990: 141-146), Rusted (1990: 86-87) and Tyler (1992: 21-22) each offer different systems of categorisation for how a communicative perspective on design relates designers, products and consumers.

⁶ For a diagrammatic comparison of the process and semiotic perspectives see Holbrook and Hirschman (1993: 8). For a unified diagram see Deledalle (2000: 125). For examples of both approaches being applied to design see Kawama (1987: 58-59) and Karjalainen (2004: 52-53).

⁷ McCloud (1993: 194-195) also describes the output from the creative arts as forms of communication between the artists' and the viewers' minds. Modern industrialised arts typically achieve this communication through media that are produced and distributed by many parties. Despite the influence of these intermediaries, McCloud insists that integrity can be maintained so that the message delivered to the recipient (that is, the viewer or reader) corresponds with that intended by the artist (McCloud, 2000: 71-72).

⁸ Draper claims that communicating through designed artefacts is difficult because design is like a monologue: "the author must anticipate possible misunderstandings and contrive a communication that will be correctly decoded without feedback by a range of recipients who differ both from the author and from each other" (Draper, 1994: 63). Ricoeur's comments on the writing process are similar: "The writer does not respond to the reader. Rather, the book divides the act of writing and the act of reading into two sides, between which there is no communication. The reader is absent from the act of writing; the writer is absent from the act of reading" (Ricoeur, 1981: 146-147). This is in contrast to the process of direct face-to-face human dialogue which is characterised by the provision of immediate feedback allowing for message modification (Anderson and Meyer, 1988: 42). In such circumstances, Westley and MacLean (1957/1966: 81) claim that the receiver of a message employs a 'cross modality check', evaluating the correspondence between the words that are spoken and any unintentional gestures or actions.

⁹ Buchanan notes that "evolution of the term 'graphic design' into 'visual communication' and, most recently, 'communication design' indicates the field that emerged" (Buchanan, 2001: 201).

¹⁰ This reflects Marshall McLuhan's (1964/2001: 9) famous dictum: "the medium is the message" because it is the medium that shapes and controls the scale and form of human association and action".

¹¹ A rare exception is provided by Salles *et al.* (2001: 455) who elaborate on Westley and MacLean's (1957/1966) model of mass communication to represent the relationship between designers, products and consumers. In this case, the product is the software user interface.

¹² Shannon's model has been highly influential in communication theory (Beniger, 1990), and continues to provoke both criticism and support (for example, see Jensen, 1995: 8-9; Severin and Tankard, 2001: 51). Although Shannon's model is certainly a classic representation of communication, it is not the first diagrammatic model of communication to be found in the literature. In considering linguistic meaning, Bloomfield (1935: 139) provides an earlier and simpler representation by depicting a speech as mediating between the speaker's situation and the hearer's response. This in turn reflects Aristotle's assertion that "a speech is composed of three factors – the speaker, the subject and the listener" (Aristotle, 1991: 80 [1358b]). In 1948 a 'model' structured similarly to Shannon's was presented in what is now referred to as the Lasswell formula. Unlike Shannon, Lasswell (1948/1966) was not concerned with the technical aspects of information transmission, but with the more general issues of human communication. As such, he suggested that an act of communication could be described by addressing the question of "Who/ Says What/ In Which Channel/ To Whom/ With What Effect?" (Lasswell, 1948/1966: 178).

¹³ Although Shannon's diagram only represents noise acting on the channel, he later considers "noise during transmission or at one or the other of the terminals" (Shannon, 1948/1993: 32).

¹⁴ For Weaver, the semantic problems relate to the precision with which the transmitted symbols convey the desired meaning (Weaver, 1949: 96). Weaver proceeds to suggest additions to the diagram to represent semantic decoding (after reception) and semantic noise (at the channel) (*Ibid.*: 115-116). Although Weaver does not present his proposed diagram, Leiss (1994: 130) has subsequently offered his own interpretation, with the addition of a semantic encoding stage before transmission. With respect to design, similar modifications to Shannon's diagram have been made by Broadbent (1973: 210; 1980: 209).

¹⁵ Schramm uses the word 'encoder' in place of 'transmitter' and 'decoder' in place of 'receiver', but for consistency Shannon's terminology is retained here.

¹⁶ Hanneman (1975: 26) presents a similar diagram but interprets it differently, suggesting that the area of overlap may actually be increased by effective communication. Swann (1991: 20) also represents both participants operating within distinct 'sub-cultures' but suggests that they are each contained within a common cultural context and therefore some references are shared.

¹⁷ Whilst communication models are scattered across a wide body of literature, some of the key models may be found in collected and analysed form (see Fiske, 1990; McQuail and Windahl, 1993; Watson and Hill, 2000; Severin and Tankard, 2001). Within the design literature, Barnard (2005: 20-24) provides a brief review of models by Shannon (1948/1993), Lasswell (1948/1966) and Newcomb (1953/1966), whilst Salles *et al.* (2001: 456) briefly review the models of Shannon, Jacobson (1960) and Westley and MacLean (1966). In a more extensive account, Minai (1984: C3) considers linguistic, semiotic and

physical perspectives on communication before presenting a number of communication process models, including those by Shannon, Schramm (1961), Newcomb, and Westley and MacLean.

¹⁸ In any case, dedicated treatments of these activities are available elsewhere. For example, see models of design reviewed by Wynn and Clarkson (2005), and models of interpretation provided by McCracken (1986: 71-72), Bloch (1995), Crilly *et al.* (2004), Mick *et al.* (2004), Creusen and Schoormans (2005) and Desmet and Hekkert (2007).

¹⁹ Kress and van Leeuwen (1996: C2, C6) examine the apparent connotations of several communication models and argue that even ostensibly neutral graphic conventions are seen to reveal deeply held assumptions or beliefs. These conventions include the type of abstract elements from which the models are constructed (*e.g.* circles, squares, triangles), the arrangement of those elements on the page (*e.g.* the basic process proceeds from left-to-right, noise intrudes from below) and the allocation of those elements to represent entities, states or processes (*e.g.* boxes for actors, arrows for actions).

²⁰ In a section asking “Could design be a form of communication?” Krippendorff and Butter explain that because the meaning of objects is dependent on context and interaction, such meaning “cannot entirely be expressed in terms of linear communication between a design and a user” (Krippendorff and Butter, 1984: 6). Nevertheless, they retain an essentially linear model with various feedback loops added. This view has been influential to (or at least echoed by) other design researchers over the last 20 years, but Krippendorff has recently distanced himself from such linear conceptions (Krippendorff, 2006: 295).

²¹ Martin Nystrand (1982) emphasises that communicative acts of expression (like writing) are analogous to acts of comprehension (like reading) because they are both actively interpretive: “The observation that listeners and readers are ‘passive’ [...] must not obscure the fact that in each case the individual, far from passively accumulating information, brings meaning to the text. [...] Discussions of the passivity of readers and listeners, compared to the activity of speakers and writers, reflect a superficial analysis of behaviour and fail to note the underlying interpretive, cognitive aspects of each.” (*Ibid.*: 80-81). In promoting the active role of the interpreter, Nystrand retains the standard linear communication model, but depicts those involved in expression and comprehension as each oriented towards the medium in ways defined by their interpretive roles. Similarly, but with respect to design, Waller (1979: 217) employs an arrow directed from the consumer to the (graphic) product to reflect how the reading of artefacts such as maps and diagrams is active and goal-oriented.

²² In this sense, Oudshoorn and Pinch (2003: 1-3) claim that users and technology are ‘co-constructed’ with each being defined by the other. For further discussion see Ihde (1993: 116) and Boess and Kanis (2008: 309); for empirical studies see Woolley (1992: 82-83), Ahmed and Boelskifte (2006) and Blythe *et al.* (2006).

²³ The philosopher, Peter Kivy states that Wimsatt and Beardsley’s *Intentional Fallacy* “made the topic of literary interpretation a central one for the philosophy of art, and made the relevance of authorial intention the crucial question” (Kivy, 2001: xi-xii). For recent argument in the arts see Montgomery *et al.* (2000: 283), Coyle and Peck (2002) and Bennet (2005).

²⁴ Discussing difficulties accessing reliable accounts of intention, Baxandall claims that the artist’s descriptions of his own state of mind, “have very limited authority for an account of intention of the

object: they are matched with the relation between the object and its circumstances, and retouched or obliquely deployed or even discounted if they are inconsistent with it” (Baxandall, 1985: 42). With respect to architecture, Bonta summarises two reasons why considerations of stated intent might be dismissed. Firstly, the meaning of creative work may not achieve the significance that was intended, and secondly, an account of intent may not represent the full achievement of the work (Bonta, 1979: 78).

²⁵ In a critical analysis of ‘the classic’ in literature, Kermode argues that “we must cope with the paradox that the classic changes, yet retains its identity. It would not be read, and so would not be a classic, if we could not in some way believe it to be capable of saying more than its author meant” (Kermode, 1983: 80). Verbeek makes a similar point about ‘design classics’ when he says “Having pop design furniture in the living room can be an idiosyncratic act of personal expression in the 1990s, but in the 1960s and 1970s may have meant simply that one was a ‘follower’”(Verbeek, 2005: 207).

²⁶ As Shannon stressed in 1948, the “semantic aspects of communication are irrelevant to the engineering problem” (Shannon, 1993: 5). However, the very absence of concepts like ‘meaning’ from Shannon’s diagram has in some instances only served to emphasise their importance (Gombrich, 1963: 60).

²⁷ Karjalainen (2004: 52-53) adopts a representation that distinguishes between the message as intended and the message as received. To this end, he adopts two distinct terms for the message: *identity* and *image*, saying, “identity [is] related to the ‘sending side’ of communication, whereas image is the interpretation of a certain message from the ‘receiver’s’ perspective”. (This distinction between *identity* and *image* has precedence in Kapferer’s (1992: 34) work.) In constructing a model of user experience, Hassenzahl (2003: 32) also distinguishes between the *intended* product character (from the designers’ perspective) and the *apparent* product character (from the users’ perspective).

²⁸ Oppenheimer adopts a similar perspective: “Marketers long have thought about the message being sent to consumers through print and television advertising, but a consumer’s view of a brand is shaped not only through these communications but also through experiences with the product itself. A positive interaction that delivers fully on the promised value of a product can reinforce a brand message like nothing else” (Oppenheimer, 2005: 82-83). This communicative perspective is only one of several schools of thought relating to corporate identity (Balmer and Greyser, 2003: 35-36).

²⁹ In certain instances there may be a broad range of interpretations that producers find acceptable and there may be unanticipated interpretations that are found to be desirable. For example, where a product’s form is determined by the requirement to minimise manufacturing costs it will seldom be problematic if users perceive those forms as resulting from a concern for functionality or usability (Woolley, 1992: 82-83).

³⁰ The relevant regulations depend on the territory of sale rather than the territory of design or manufacture. For English law see *Consumer Protection Act 1987, s3(2)(b)*; for European law see *Products Liability Directive: Article 6(1)*; for U.S. law see *Restatement, Third, Torts: Product Liability, §2*. For courtroom application of these regulations, the use of other tests (e.g. ‘risk-utility tests’) and case law in other territories see Miller and Goldberg (2004: C11, §B).

³¹ Nadin's (1988: 274) design model emphasises that it is not just the product, or interface, that mediates between designers and consumers, but also the packaging, documentation, advertising, service and any tutorials or seminars that are offered. Extending the work of McCracken (1986: 71-72), Mick *et al.* (2004: 4) construct a framework that represents three stages of activity that producers employ to set up meanings and to guide consumers toward them. These activities focus on 'potentializing' meanings in the object (*e.g.* product design), around the object (*e.g.* packaging, branding, advertising), and in the retail environment (*e.g.* physical stores, the internet). In each of these stages, and in the fourth and final stage of acquisition, the consumer constructs (or 'actualizes') meaning, regardless of whether these meanings are what the producer sought to 'potentialize'. As Mick *et al.* acknowledge, their four-stage framework reflects the models of the process school, as informed by notions of constructed meaning (*Ibid.*: 5).

³² Armstrong (2000) warns that such notions of design (the translatability of words and forms) are inaccurate, but still claims, somewhat ironically, that they offer the advantage "of representing design as intelligible and tractable, since ordinary language is both the medium and the output of managerial committees" (*Ibid.*: 12).

³³ Or, more generally, "we determine that something is a member of a given artifact kind by inferring that it was successfully created with the intention to belong to that kind" (Bloom, 1996: 1). Bloom's work takes philosopher of art, Jerrold Levinson's 'intentional-historical' definition of art as its conceptual foundation. Levinson (1979: 234), claimed that the inference of intent relates not just to how an artwork is regarded, but to whether the stimulus in question should indeed be regarded as art: we call objects artworks if we believe they are the result of actual artistic intent. In the simplest of a series of ever more precise definitions, Levinson states that "*a work of art is a thing intended for regard-as-a-work-of-art: regard in any of the ways works of art existing prior to it have been correctly regarded*" (Levinson, 1979: 234). Levinson thus attacks the anti-intentionalist perspective by arguing that intentions do in fact define art (Levinson, 1979: 246-247). For a more recent statement of Levinson's position see Levinson (1989). For discussion, including arguments and counter-arguments, see Stecker (2003: 150-152)

³⁴ Similarly, archaeologists build up a picture of the values and activities of the society from the artefacts that are left behind, often inferring function from form (Shelley, 1996: 280; Slater, 1999: 344-345). In this sense, Kroes (1998: 23) claims that 'function follows form'.

³⁵ Or, again more generally, "we infer that a novel entity has been successfully created with the intention to be a member of artifact kind *X* – and thus is a member of artifact kind *X* – if its appearance and potential use are best explained as resulting from the intention to create a member of artifact kind *X*" (Bloom, 1996: 12).

³⁶ Where neither the design stance nor the physical stance are accessible, Dennet (1987) proposes that the 'intentional stance' is adopted. Here, artefacts are regarded as intentional agents that are predicted to behave in ways that suit their own goals.

³⁷ In a thorough critique of communicative perspectives on architecture, Bonta warns against confusing inferred intent with actual intent: "Interpreters sometimes feel that designers intend to communicate something. But this is a belief of the interpreter, not an intention of the designer" (Bonta, 1979: 227).

Some empirical support for consumer inference of design intent (including inferences that diverge from the designers' declared intent) is provided by Woolley (1992: 82-83).

³⁸ Similarly, Roland Barthes (1964/1988: 182) insists that all products have meanings that exceed their practical utility: "they function as the vehicle of meaning [...] and when they do not, when they feign to have none, then precisely they end up by having the meaning of having no meaning. Consequently, there is no object which escapes meaning".

³⁹ In this sense, Waller's model (1987: C5) represents how readers read a text produced by some 'imagined writer'.

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