Legitimating design: a sociology of knowledge account of the field

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This paper presents a sociology of knowledge approach to describe disciplines in the field of design. We show how the approach casts the nature of knowledge in design disciplines as based upon socially agreed criteria for what constitutes the realization of legitimate knowledge. Interviews with designers and analyses of professional and pedagogic discourse about design are used to illustrate how the approach reveals the differences in what kind of design knowledge is valued, cultivated, and emphasised within a discipline. By placing a sociological lens on knowledge in design, we aim to suggest a language by which what counts as design knowledge can be explicitly expressed. A common, shared language to describe the differences opens a mechanism to discuss what can count as knowledge, rather than to retreat into corners and only agree to disagree that there are different knowledges in design.
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> An engineer's training is classical; it is a training in control. An architect's training is primarily romantic, a training in aesthetic conscience. … They see conflict between the two modes and control by their own mode as essential. (Happold, 1986, p. 136)

This quote is representative of one of a number of tensions within the field of design concerning differences in the interpretation of design activities and the knowledge required to undertake them. Such tensions express disagreements existent within the field about what knowledge one needs to design and what is the 'right' kind of knowledge. Debates over what counts as knowledge (e.g. empirical evidence, first-person accounts) and what displays of knowledge distinguishes disciplines are not new among academics and practitioners. However, they have become of growing concern in a contemporary climate that encourages inter- or even post-disciplinarity. Competing claims to knowledge touch upon all aspects of the professional practice of a discipline, shaping who is viewed as having insight, who is entitled

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to participate in the profession, whose voice is more legitimate, and so on. Calls for collaboration both within and between disciplines require knowledge of the knowledge and practices that are being brought together, or such calls will remain more rhetoric than reality.

This kind of debate is no stranger to the field of design. When design researchers and design professionals describe their processes, they tacitly assume that the readers (observers) already know (or agree with them) what constitutes a legitimate display of design knowledge. That is, the designers are performing what is essentially describable as designing. The competing claims to what counts as design knowledge is further complicated by incorporating the 'totality of disciplines, phenomena, knowledge, analytical instruments and philosophies that the design of useful objects must take into account' (Vitta, 1989, p. 31). In fact the 'culture of design' was said to encompass the 'culture of the object' itself. The struggles to agree upon what counts as design knowledge and its cultural identity can therefore be perceived as affecting and being affected by a complex system involving economy, production, social significance, consumption, use of objects, and so on. The broadness of what may be incorporated into the interpretation of design activities is overwhelming and its complexity may even prevent the realization of the discussion of what is considered legitimate design knowledge.

The many ways of describing design, which in turn need to make the assumption that what counts as a legitimate display of design knowledge has been 'agreed upon', has been partially rationalised by Dorst (Dorst and Dijkhuis, 1995; Dorst, 2008a, 2008b). Dorst cast the debate as a dialectic between Simon's rational problem-solving paradigm (Simon, 1995, 1996) and Schön's reflective practice approach (Schön, 1983). Whilst acknowledging the complexity of design, Simon writes, 'Design is inherently computational – a matter of computing the implications of initial assumptions and combinations about them.' (Simon, 1995, p. 247) Conversely, Schön embraces the inherent complexity of design and regards purely rational approaches with their reductionist tendencies and emphasis on quantitative data as unable to cope with the realities of design in practice. The 'reflective practitioner' must apply knowledge and experience to each unique circumstance.

At this point, we could rehearse all of the debates surrounding the description of design, and categorise the debates along dialectics including art vs. science, qualitative vs. quantitative, and rational vs. reflective. There is not one single description of design that could be agreed upon by practitioners and academics in the field since the design disciplines are continuously evolving and expanding into new dimensions, in both their practices and understandings (Buchanan, 2001). Individual designers are both artists and scientists, applying qualitative methods even during rational problem solving. The challenge in reaching an integrative discussion *about the field of design* is that designers

claim the field by reference to how they practice design. As described by Papanek (2001), there are those who aim for a design process that is more methodical, scientific, conventional and computer-compatible or those who follow a process that embraces 'feeling, sensation, revelation and intuition' (p. 56). Fundamentally, we see the debate as being not over what *design is*; rather, the debate is over what *design knowledge is*.

The problem with any debate over design is that the intellectual resources with which the debate is typically engaged are themselves located within the field, and the competing definitions of design is the terrain over which struggles are fought and the resources used in those struggles. Each actor (or in this case, each designer) engages in these struggles and does so from a position within the field; each has a situated viewpoint and this viewpoint shapes the analysis of the field (Bourdieu, 1983). Thus, there is a need to be able to view the field afresh, from a perspective that is not associated with any specific position within the field but rather objectifies the field. This is not to argue for an 'ultimate-truth' perspective, but rather to suggest that, in order to be able to analyse the debates, one needs specific kinds of tools. Designers work with knowledge to 'do' design. When analysing the field of design the object of study has now shifted: it is not the design object but knowledge itself as an object that is being studied. For engineering a bridge, engineering knowledge is valuable; for designing a house, architectural knowledge is valuable. For analysing knowledge, a theory of knowledge itself is valuable.

There is still a need for a more integrative discussion. Schön described this as tensions that a theory of designing should resolve. He saw them only as differences between the way different types of designers practice design. 'These individuals in their different roles tend also to pursue different interests, see things in different ways, and even speak different languages.' (Schön, 1988, p. 184) We see the tension differently. The ways that the debates have been cast, we believe, are actually surface features of a more significant difference in the underlying structuring principles of the disciplines of design. This paper claims that these debates have, at their core, disagreements as to what form of knowledge is valued within a discipline of design. The differences in the ways of describing design emanate from differences in the underlying bases of knowledge.

Within the field of design, differing grounds exist for deciding what should count as relevant, within and amongst the design disciplines and its practitioners. To complicate matters, 'design' incorporates a range of disciplines, from architecture and engineering (which includes its own specialisations such as mechanical, civil, electrical, and chemical) to new media and interior design. While all practice design in its broadest sense — the intentional production of a material work to satisfy functional needs — they also perform design

in different ways. Such differences can be understood as reflecting the various values, beliefs, and mores held by a design discipline, or what Strickfaden et al. (2006) has called the 'culture medium'. These values and beliefs function as structuring principles which generate and organize design practices; they are related to what Bourdieu defines as 'habitus' (1983) in that these values become internalized codes which equip the designer to operate successfully within the 'rules of the game' of a design discipline. Therefore, how knowledge is put to use to practice design within a discipline is premised on what counts as knowledge and what counts as a recognizable design practice within the discipline. What designers do to make their activities ontologically described as architectural design or engineering design is to perform design activities according to the unwritten rules of the discipline.

So, the debate is not about the surface-level descriptors of what designers do, such as the diversity of the knowledge needed to design in architecture and engineering, but what is the form taken by the knowledge that is valued, cultivated, and more generally emphasised within a discipline. It is a consequence of a sociological decision as to what counts as knowledge that leads to organising principles around the formation of design disciplines as practicing versions of design, which may exhibit what is ultimately labelled as scientific or artistic sensibilities.

This paper aims to uncover the differences in what counts as valued design knowledge within various design disciplines using a sociology of knowledge approach based on Legitimation Code Theory (LCT). By examining the underlying structuring principles of various instances of design, we make explicit what is different and how such differences may affect the way one understands design. Our belief is that understanding this structuring may help explain why different images or conceptions of design can produce the kind of tensions described by Schön. Understanding this structuring may also help us to see why we should expect clashes if an image of the legitimate performance of design cannot be made explicit and negotiated.

In the first part of the paper, we describe a sociological approach to understanding how knowledge shapes social fields of practice: Legitimation Code Theory. We then discuss how this approach was used to excavate the underlying principles structuring positions within different design disciplines through analyses of interviews with designers. We contextualise the interview results within official pedagogic and professional discourse as to what kind of knowledge is valued within the disciplines and how this valuation is further reflected in the research literature. Finally, we discuss how these varying claims to design are not restricted to conceptual debates; instead they may produce real world 'clashes' over the way design knowledge is believed to be legitimately realized. By objectifying these debates, we aim to enable productive insights into

the nature of the various design disciplines, and therefore move forward in our understanding of design.

1 *The structuring of knowledge in design*

Legitimation Code Theory (LCT) integrates insights from the approaches of Pierre Bourdieu and Basil Bernstein to provide a framework for analysing the structuring of knowledge and practices within pedagogical and intellectual fields (see Maton, 2000; Moore and Maton, 2001; Maton and Muller, 2007). LCT views disciplines as fields of struggle over status and resources in which the beliefs and practices of actors embody competing claims to legitimacy or messages as to what should be considered the dominant basis of achievement within the field. These 'languages of legitimation' are analysed in terms of their underlying structuring principles or *legitimation codes*. One dimension of the code is 'specialisation' or what makes someone or something different, special and worthy of distinction. This dimension is based on the simple premise that every practice, belief or knowledge claim is about or oriented towards something and by someone, and so sets up an *epistemic relation* to an object (ER) and a *social relation* to a subject (SR). Simply put, each relation may be more strongly (+) or weakly (−) emphasised in practices and beliefs, and these two relative strengths of emphasis together give the code. Thus, a claim to insight or legitimacy can be viewed as specialised by its epistemic relation, by its social relation, by both, or neither. Figure 1 outlines four such codes:

- a *knowledge code* (ER+, SR−), where possession of specialised knowledge, skills or procedures are emphasised as the basis of achievement, and the dispositions of authors or actors are downplayed;
- a *knower code* (ER−, SR+), where specialist knowledge or skills are less significant and instead the dispositions of the subject as a knower are emphasised as the measure of achievement, whether these are viewed as

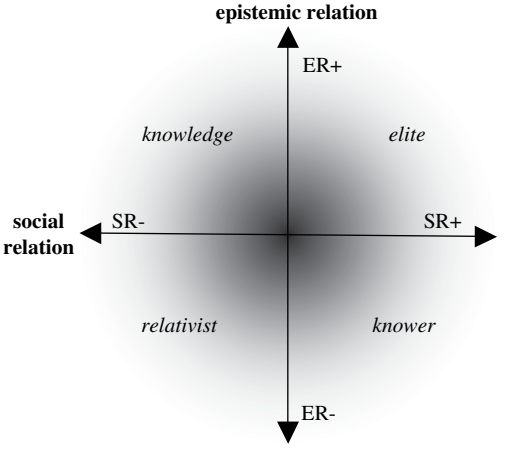

Figure 1 Legitimation codes of specialisation Source: Maton (2007:97)

natural (e.g. 'genius'), cultivated (such as an educated artistic gaze) or socially based (such as a specific gender, e.g. feminist standpoint theory);
- an *elite code* (ER+, SR+), where legitimacy is based on both possessing specialist knowledge and being the right kind of knower. ('Elite' does not necessarily mean 'socially exclusive' but rather highlights the necessity of possessing *both* legitimate knowledge *and* legitimate dispositions.); and,
- a *relativist code* (ER−, SR−), where legitimate insight is ostensibly determined by neither specialist knowledge nor specific dispositions.

These legitimation codes conceptualise the 'rules of the game' − the dominant basis of success in any particular social context. Within any context, a specific code may underpin the unwritten rules of the game, but there may be struggles over which code is dominant − a 'code clash'. It should be emphasised that there is always an epistemic relation to an object and a social relation to a subject − there are always both knowledges and knowers. What LCT asks is *which* of these is *emphasised* in practices and knowledge claims. In other words, it explores whether the rules of the game are such that what matters is: one's demonstrated possession of specialist knowledge (knowledge code); one's sensibilities, attributes and dispositions (knower code); both (elite code); or neither (relativist code). This framework is currently being used in a range of empirical studies of educational issues (e.g. Doherty, 2008; Lamont and Maton, 2008).

How designers perceive knowledge (and determine what types of knowledge are valuable) in their field is pivotal to LCT because designers need to have 'recognition rules' (Bernstein, 2000, p. 17) in order to differentiate design disciplines and to identify the specificities of the discipline one is in. In other words, it is through these recognition rules that an individual designer identifies what meanings are relevant in the 'home' discipline. Once recognition rules are established, 'realization rules' (Bernstein, 2000, p. 17) will regulate how meanings are to be put together (i.e. how design is practiced) so that the individual designers practice and communicate according to the discipline. If the criteria and values for knowledge change, these recognition and realization rules adapt accordingly.

The relation between recognition and realization rules, epistemic and social relations, and the interpretation of design processes is illustrated in Figure 2 using the analogy of the refraction of light. The field of design is the common 'light source' or scene viewed by actors. Each actor (or group of actors or discipline) views the field differently: each has a particular lens. The nature of the lens through which they gaze on design can be conceptualised using the notion of legitimation codes. The lens refracts light according to this code (e.g. knower code ER−/SR+ or knowledge code ER+/SR−) resulting in different valuations of what is legitimate design. What is recognised as legitimate design processes is then labelled as artistic or scientific. Such

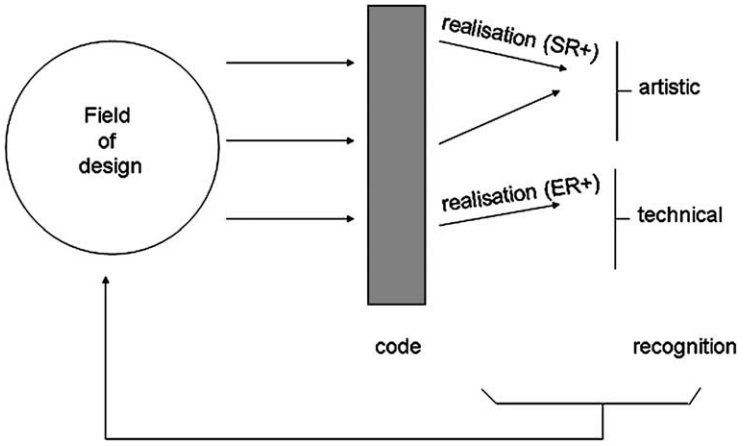

Figure 2 Recognition and realization of design according to LCT

descriptions are how actors in the field portray its practices; from the perspective outlined here, they are the surface features of a more significant underlying structure principle, that is, the lens (or code) which results in differing valuations of knowledge and practice.

2 *Qualitative study*

We used the above framework to analyse interviews with designers from engineering, architecture, digital media and fashion design disciplines. Eight designers were interviewed about their views of design within the following disciplines: engineering, fashion, architecture, and digital media. The aim of the interviews is to ascertain the way design professionals perceive their discipline, other designers and what constitutes genuine or original design within their particular design discipline.

The participants comprised: two designers from each discipline; four males and four females; four working in their own practices and four employed within organizations. All participants had at least seven years of professional design experience. An open-ended interview protocol was used to investigate their perceptions of their discipline, of designers, and of what counts as genuine or original design work. Each individual interview lasted between 30 and 60 min and was audio-taped and transcribed. Questions in the interview protocol included:

How would you describe your design discipline to someone who is new to the field?
What would be the most important information a new person entering your discipline should know about working in the field?
What are the essential characteristics that a designer must have?
What qualities do you look for in a prospective employee/partner?
What are the characteristics of an interesting, original, valid, genuine work in your discipline? Can you give me an example?

A key aspect of the investigation is the qualitative analysis of the language (words) that the designers use to describe what knowledge is valued in their discipline and how knowledge is evaluated. The analysis searches for patterns within the designers' accounts, on the way they describe their design discipline, how they describe what is necessary in order to be a designer, and their explanations of what is valuable or original design. The analysis was also supported by the use of a matrix, created to guide the research process. This matrix allows the mapping of the theory to data and vice versa, working as a translation device (Carvalho and Dong, 2008). It is based on Bernstein's concepts of languages of description (2000).

2.1 Engineering design

The ways the interviewed engineering designers describe their discipline can be understood as being grounded on the *epistemic relation* of knowledge to its object. When describing originality, both participants focused on the application of engineering, rather than features of the designed object itself or how that object is experienced. A key focus was how the solution meets the problem and how the technical challenges are overcome so that the designed product could be generated. Engineering Designer 1 exemplifies original work by explaining how knowledge is used to meet a solution to a problem:

> …the Seacliff Bridge down the South Coast is an example. What it is, is fantastic application. There is nothing particularly, in a purely engineering sense, there is nothing new about that bridge. (…) Where *the real originality* in that project is, is not necessarily the bridge itself, it's just the application. It is taking that type of bridge and putting it where it is *to solve a problem* which was about rocks falling off the face of the cliff. Again it is about *the solution to what was probably a geotechnical issue* which was slope stability was down by a bridge. (Emphasis added)

Similarly, Engineering Designer 2 exemplified value in engineering design in terms of the use of research and mathematical knowledge in 'The Water Cube', the National Aquatics Centre for the Beijing Olympic swimming pool.

> *Interesting, original*. Probably the most obvious one to explain is the water cube. (…) that was *the idea of the building needed to be square*, so how can we make a building square and still make it interesting (…) they sort of look at how soap bubbles form and then did *research on the mathematics behind* and (how could) you automate that (…) That geometry you see there is the creation of if you've got a soap film and blew it up and that's how it was created. (Emphasis added)

While emphasising the ways in which specialised engineering knowledge is applied to design situations (the epistemic relation of knowledge to the object), the engineering designers also downplayed the *social relation* of knowledge to

the subject. Even when discussing the interests of engineering designers, the participants emphasised mathematical and physical concepts required by the discipline and downplayed subjective aspects, emphasising they should possess a 'liking' rather than a 'passion' for technical issues; for example:

> They should have a technical, not a passion, but a liking for technical sort of problems and the like. So that's why a lot of engineers are just good at maths and science because it leads you that way and every day there's physics concepts and mathematical concepts that are just sort of part of my every day life.
> (Engineering Design 2)

Similarly, both interviewees differentiated between the focus of engineering on meeting technical requirements and the focus of architecture on more subjective issues, such as beauty:

> things stay up because we (engineers) design them to stay up and architects design them to fit into the environment and look beautiful and work well (Engineering Designer 1)

In summary, the participant engineering designers emphasised specialised knowledge, skills and procedures as the basis of insight and quality (stronger epistemic relation) and downplayed the significance of the dispositions, attributes and aptitudes of subjects (weaker social relation): a *knowledge code*.

The emphasis and value placed on technical knowledge is a long-standing tradition in engineering design. Based on a longitudinal review of engineering design practice in Germany (Pahl et al., 1999), the authors stated:

> 'The *essential thinking and procedural obstacles*, as well as errors in thought and action were recognised. They originate mainly in *disorderly or, respectively, non-systematic procedures* where individual strategies do not revolve sufficiently around specific problems. Very good results are often missed due to a lacking analysis of target and demand, too narrow and insufficiently abstract observation of the solution field, as well as insufficient analysis of the solution.' (Pahl et al., 1999, pp. 493–494) (Emphasis added)

Systematic thinking and orderly processes and procedures comes to be knowledge that is valued in engineering design.

In fact, other researchers have shown that the social relation to knowledge is looked upon with caution in engineering design. In their study of engineering designers at Rolls-Royce, Baird and colleagues found that *the way that knowledge is gathered* is at least as important as who possesses and transmits the knowledge, if not more so (2000). The authors describe the valuation of

engineering knowledge at Rolls-Royce as part of the company's provenance system.

> Engineers routinely preface their contributions to team meetings and informal discussions with the name of the contributors to their data. If this information is not given it is requested. Equally they give the process by which they gathered their evidence and they give a verdict based on it. If they give verdicts without evidence or evidence without verdicts they are asked to complete the statements. The informal social system of peer evaluation also includes a decision about how pessimistic/cautious/cavalier the opinion is. … This provenance system has thus had a long and enduring history and each verbal opinion is still duly modulated. (Baird et al., 2000, p. 345)

The value of knowledge is embodied in the objective evidence provided; the engineer who is valued is the one who followed processes grounded in systematic and scientific approaches. A 'commitment to the ideas behind their designs' as 'one of the things that architects value most highly' (Lawson, 1994, p. 134) is not as highly valued in engineering design.

2.2 Fashion design

In contrast, the interviewed fashion designers emphasised the kinds of dispositions, attributes and attitudes required to be a successful designer:

> (…) probably the most important thing is have, have, I don't know like *have that sensation that something inside of you* is pushing you to do this and you don't quite know why. (…) *There's something inside of you* that says you can't live without this thing, if you can't, if somebody took that away from you you'd be as good as nothing, that you'd be as good as dead probably. (Emphasis added)
> (Fashion Designer 1)

Rather than a 'liking … for technical problems' (see above), here a designer needs an 'inner calling', and to have 'a lot of passion' or 'a strong interest' (Fashion Designer 2). Maton (2007) emphasises that there is always an epistemic relation and a social relation (or, there is always knowledge *and* knowers). Here, the fashion designers did not suggest that technical skills were not required, but, rather, placed these secondary to personal attributes. The interviewees emphasised that one needs to have motivation, passion and artistic attributes *before* embarking on the technical aspects of the discipline. Indeed, some skills were viewed as part of one's personal characteristics, such as having a 'natural' sense of proportions or of colours:

> I don't think there are any prerequisites to be honest. I don't think you have to be an amazing illustrator (…) I think *there are natural things that you know*, a *sense* of colour and a *sense* of just *a natural sense of proportion* and um somebody can try and teach you all that but I think *if you*

> *haven't got it naturally* well then you know, everything's a lot slower, the whole process is probably a lot slower I guess. (Emphasis added)
> (Fashion Designer 1)

For one interviewee, fashion design is akin more to art than to a technical science, describing themselves as 'a practising contemporary textile artist who predominantly weaves' (Fashion Designer 2).

This emphasis on the social relation and downplaying of the epistemic relation – a *knower code* (ER−/SR+) – was reflected in how the participants described originality in fashion design. Rather than utility and function in relation to a defined problem, original design was described in more 'subjective' terms, such as the experiences it evokes in an audience (e.g. 'containing a real simplicity', Fashion Designer 2), its use of old ideas in new ways that might surprise the audience, or its cultural or political message; for example:

> (…) the new techniques or new materials and incorporated that with the traditional element of fibre art. (…) Using the hand craft as a cultural or a political practice and message but um she's showing *her contemporary side* of it. (Emphasis added)
> (Fashion Designer 2)

2.3 Architecture design

While the engineering designers highlighted systems and procedures and fashion designers used intersubjective terms, the interviewed architecture designers described their discipline as *combining* creativity with scientific knowledge – a balance between 'arts' and 'science'. For example, architecture was described by one interviewee as 'a discipline that crosses a number of fields in terms of balance, creative and philosophical endeavours with quite scientific engineering bases.' (Architecture Designer 1). Similarly, the kinds of attributes they suggested were required by a successful designer combined artistic and scientific characteristics. Architecture Designer 2, for example, argued:

> (…) *it is a combination of passion and creativity and tenacity* but then you also do need the *rigors of discipline and structure and order, organisation as well*. I think a lot of *people maybe don't have that balance*, it's the old thing about you know, art and science to me that covers that, *it is that balance of art and science*; creativity and pragmatism.

Though there are always epistemic and social relations, so one expects participants to discuss both skills or procedures and subjective characteristics (unless operating with a relativist code, where both are unimportant), architecture designers not only discussed both (as did other designers) but also *emphasised* both equally – an *elite code* (ER+, SR+). Originality in

design is, participants suggested, a matter of juggling two measures of achievement:

> I always tell people it's like juggling and *always trying to make things practical* but *you also have an agenda that's a social agenda or a creative idea or an artistic idea* and they don't always meet. And *when they do meet well*, that's when good products come out. (Emphasis added)
> (Architecture Designer 1)

Like the engineering designers (above), the interviewed architecture designers emphasised the need to provide solutions to specific problems, but they also emphasised the artistic and creative dimension that architecture brings to the solution of such problems. This difference was highlighted by both the engineering and architecture designers; for example:

> (…) a lot of the time what the architect or designer can do is *bring imagination* to that process because anybody can pour concrete or you know, build buildings in commodity but hopefully there's a jump between a particular need either by, a society need or a community need or a business need that *the architect can imagine* how that might manifest itself in a built form. (Emphasis added)
> (Architecture Designer 2)

Conversely, Architecture Designer 1 argued that though technical processes and abstract knowledge are important, 'the kind of thing that drives your ideas is much more intrinsic to you and your way of thinking'. Similarly, the architects measured the success of solutions to design problems not only in terms of functionality or the nature of the object itself but also one's experience of the designed object. They talked, for example, of 'buildings that have genuinely moved me', the 'connection to a number of selves, which is always personal' that great design achieves, the 'self referential' and 'subjective' nature of design (Architecture Designer 1) and the need to 'appreciate the space' (Architecture Designer 2). Thus, legitimacy for these designers was primarily based neither on dispositions of the author nor on the relations of specialist knowledge to its object but rather on both being evident.

This mutual emphasis on knowledge and knowers (or epistemic and social relations) varies somewhat from Lawson's opinion that architectural designers 'see technological problems as of secondary importance or even as tertiary considerations' (Lawson, 1994, p. 136) This may, however, be a matter of interpretation of the interviews. Architecture Designer 1 commented, 'You can always find your way through the sciences through engineers and other people, but the kind of thing that drives your ideas is much more intrinsic to you and your way of thinking …'. Yet, this designer never seems to privilege one over the other, leading us to weigh that, on balance, both relations are equally emphasised.

2.4 Digital media design

Where interview responses from designers in the other three design disciplines tended to share similar legitimation codes (though often expressed in different ways), the digital media designers interviewed were more divergent. One designer emphasised the personal attributes of designers as being crucial for achievement:

> I think that worldly experience helps you, you know, if you know how to speak to people (…) you're not born a graphic designer or born a designer, you can, I think you can actually develop those skills but you have to have a good idea about them and you know, you can develop them.
> (Digital Media Designer 1)

For this designer, the kind of design knowledge one may 'pick up' through personal experience is more significant than that acquired by formal study, and being 'worldly' is more relevant than a 'beautiful portfolio'. Legitimacy here comes from attributes of the designer (stronger social relation), such as interpersonal skills, while the significance of specialist techniques related to a well-defined object is downplayed (weaker epistemic relation): a *knower code*. For example, ideas may come from everywhere (ER−) and are selected, recontextualised and legitimated on the basis of the personality of the designer (SR+):

> I've had so many different jobs, in hospitals and I've worked in prisons as well in the area of information collection so *I've had this weird background* so I think all of that creates *an originality* that if I was a graphic designer from when I was eighteen to now, I probably wouldn't have that, because *I can draw upon that wealth of information inside* that makes it different, but I don't know what makes it. *It's such a personal thing, what makes something interesting*. What do they say, one man's meat is another man's poison. It's kind of like, *it's so subjective*, isn't it. (Emphasis added)
> (Digital Media Designer 1)

In contrast, the second interviewee focused on technical content and the ways one might use this knowledge to present information or communicate ideas. Rather than viewing design as 'subjective' and 'a personal thing', Digital Media Designer 2 emphasised the importance of designers emotionally distancing themselves from their designs (SR−) and instead focusing upon providing design solutions to problems (ER+): a *knowledge code*. For example:

> *Critical thinking and analysis* and also to really separate yourself from your designs emotionally and always remain focused on *providing a solution* and there's more than one solution to a problem. So you can't really afford to become tied to a solution. (Emphasis added)
> (Digital Media Designer 2)

It is the problem that provides the basis for selecting, recontextualising and legitimating knowledge and ideas, rather than the personality or subjective dispositions of the designer. Similarly, originality in design is, for this digital media designer, based on how a work has addressed particular issues. Indeed, the designed object is judged in terms of the application of technical knowledge to provide solutions to a series of tightly defined problems:

> (…) you can say in this (web)site *this worked really well here*, which might be a tiny bit of it and I just actually can't think of anything. I know there are things that I've seen and gone, '*Oh that works really well here*' or something, but when I'm scouting around, I never really look at a site as a whole anymore. I look for individual pieces now, because the work that I'm doing is so detailed. (Emphasis added)
> (Digital Media Designer 2)

For this participant, the designer is also an object – a consulting resource for the employing organization: 'If you're being employed and for me here I'm seen as a resource, so I come into projects, give my consultation or do my work on it and then leave again.' Thus, the social relation to the designer as subject is downplayed in favour of the epistemic relation to the design object.

2.5 What is legitimate design in these disciplines?

Interviewees from across the range of design disciplines emphasised the difference between designers and the lay audience. Architecture Designer 2, for example, stated that:

> (…) what makes it a great piece of work is because it is complex, you know it's not easy to achieve so you've got to be prepared again to have this vision, have this idea um and I think that's what makes it interesting because the average lay person will go in and they won't appreciate any of the complexities, they will just appreciate the space as a good, simple inspiring space.
> (Architecture Designer 2)

Similarly, though Fashion Designer 2 focused on good design 'containing a real simplicity', this feature of quality was something that many people would not see. However, the basis of this 'vision', or difference between professional designer and 'laypeople', varied across design disciplines.

The way participants described the basis of legitimacy in their own discipline can be understood as representing a knowledge code for engineering, a knower code for fashion, an elite code for architecture, and either a knowledge code or a knower code for digital media. Figure 3 maps the analysis of the interviews as legitimation codes. The two different codes underlying responses from the two digital media designers might reflect their different working environments: a knower code underlay the responses of a designer working in a small private

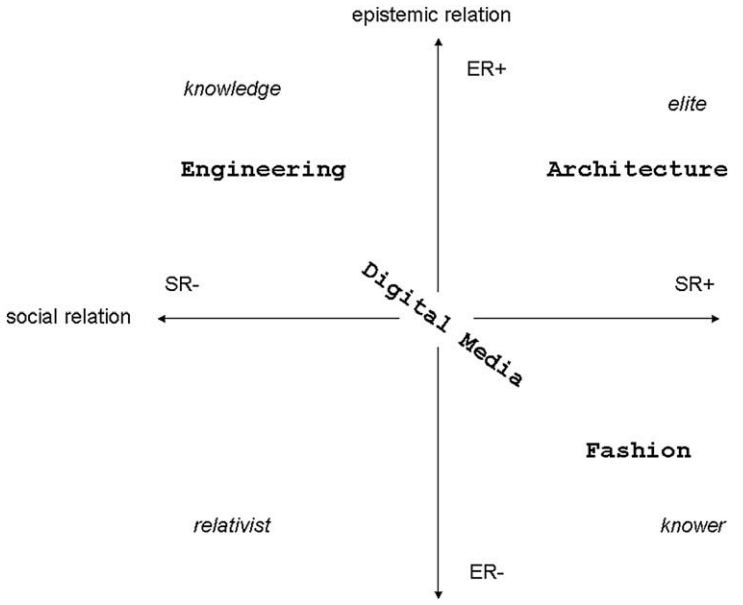

Figure 3 Legitimation codes of design disciplines

company; a knowledge code was voiced by a designer working for a large corporation, a potentially more anonymous and less intimate environment. Also, digital media is a comparatively younger field than architecture, engineering or fashion; claims to the legitimacy of knowledge in this discipline may not yet have coalesced.

As the interviews illustrate, the design field is characterised by a range of different legitimation codes. Drawing inspiration from Jacob Grimm's concept of *Sprachgeist*, we could describe these codes as *Gestaltungsgeist* – the spirit of design in these fields that drives practice along certain lines of thinking. Though only a limited number of eight participant designers (necessarily small because the aim was to generate data of sufficient qualitative depth), these codes do resonate with how professional societies and schools of design publicly describe their own disciplines and what their discipline values. We have taken excerpts from professional bodies and noted schools of design to ascertain whether equivalent valuations on knowledge are reflected in professional and pedagogic discourse, respectively. Given that the professional bodies represent the practice of a discipline, they provide a statement on how the discipline has organised itself socially and expectations as to how practitioners within the discipline are to orient themselves towards the discipline.

> Professional Engineers *apply advanced skills in the analysis and knowledge of* science, engineering, technology, management and social responsibility to *problem solving and synthesis* in new and existing fields. … Professional Engineers lead teams or work in them and *need to be innovative and creative to develop the best possible solutions*. The engineer must frequently

> make *balanced judgements* between design refinement, cost, risk and environmental impact. … *Top level mathematics, physics and chemistry* are highly recommended subjects.
> (Engineers Australia, 2008, emphasis added)

As the italicized text highlights, engineering involves both specialist knowledge and specialised dispositions. Nonetheless, specialist knowledge (in 'mathematics, physics and chemistry') are emphasised so that creativity and innovation can serve the need to provide 'the best possible solutions' (knowledge code). In contrast, the Royal Institute of British Architects (RIBA) emphasises equally specialised knowledge and imagination and creativity (elite code):

> As *professional experts* in the field of building design and construction, architects use their *unique creative skills* … Because of *their ability to design* and *their extensive knowledge of construction*, *architects' skills* are in demand in all areas of property, construction and design. *Architects' expertise is invaluable … Architects can be extremely influential* as well as *being admired for their imagination and creative skills*.
> (RIBA, 2008, emphasis added)

Architects' 'unique creative skills' (an emphasis on the social relation) are a characteristic that is strongly noted by Lawson in his study of key architects. 'What is beyond doubt is that each of the designers discussed here have strong programmes of their own which they explore and develop through their design work.' (Lawson, 1994, p. 144) Architects 'explore and develop their own intellectual programme' (Lawson, 1994, p. 138) by working on various projects. Lawson's conclusion further affirms the personal relation to design knowledge that architects cultivate through their practice and come to value. In contrast to this description of architects with an emphasis on a social relation to generating knowledge, Baird characterises valuable knowledge becoming archived at Rolls-Royce, as being recorded/stored through following particular procedures: 'Such knowledge is captured by experts over successive fleets of engine history and is recorded in data, diagrams, written reports. This data is gathered by specialist engineers who have particular interests in engine components histories and is moderated by their experienced judgement.' (Baird et al., 2000, p. 346).

In Fashion, as exemplified through a passage from the Central Saint Martins website, much greater emphasis is placed on the designer's characteristics (knower code); for example, being a 'hard worker', 'flexible', 'passionate', 'innovative', 'highly creative', someone able to make 'outstanding contributions':

> Fashion is a fast moving and highly diverse international industry… It takes *hard work, flexibility and passion to succeed*. The BA Fashion course at Central Saint Martins has earned a national and international reputation for producing *innovative and highly creative designers* and *fashion*

> *communicators who have gone on to make outstanding and directional contributions* within a variety of fashion professions in the UK and abroad. Graduates include such *influential names* as John Galliano, Hussein Chalayan, Matthew Williamson, Stella McCartney…
> (Central Saint Martins, 2008, emphasis added)

Lastly, the excerpt extracted from the American Institute of Graphic Artists illustrates that, within the digital media community, greater emphasis is also placed on dispositions of the designer, as someone who needs to be 'particularly thoughtful'. No emphasis is placed on specific processes, techniques, or skills.

> Graphic design is complex combinations of words and pictures, numbers and charts, photographs and illustrations that, in order to succeed, demands the clear thinking of *a particularly thoughtful individual who can orchestrate* these elements so they all add up to *something distinctive, or useful, or playful, or surprising, or subversive or somehow memorable*.
> (American Institute of Graphic Artists, 2008, emphasis added)

In summary, disciplines in the field of design practice design differently not just because of the variety of knowledge that is required to perform the associated tasks but because of the way that knowledge is valued in the respective discipline. They have different 'rules of the game', measures of achievement or 'legitimation codes'. Evidence from interviews, professional bodies, schools of designs, and research literature illustrate different trajectories for the disciplines based on whether the discipline is underpinned by a knowledge code, knower code or elite code. In other words, actors from each discipline tend to possess a different lens through which they view the field of design and its practices; each discipline is dominated by a particular code (or, in the case of the less concretely defined digital media, by two competing codes). Clearly, within a discipline, a designer has some level of individual agency to adopt a different code to that which dominates the discipline. Thus, a different sample of interviewees and professional bodies may result in slightly different results. However, what we believe will not change is that the data will suggest the recurrence not of an art vs. science, quantitative vs. qualitative or rational vs. reflective dialectic in design disciplines, but substantive differences in the valuation of knowledge. Disciplines structure their profession in an image of the knowledge they value. The evidence shows that speaking of knowledge in design cannot be neutral and asocial as to what counts as knowledge.

3 *Summary and way forward*

Overall, this paper discussed how differences in design definitions are much more than an academic or practitioners' matter. Disagreements exist within the various design disciplines involving fundamental issues underlying people's beliefs about what should count as knowledge within the discipline.

We illustrated how LCT offers an approach that goes beyond superficial differences to explore the basic principles underlying knowledge. By using this sociological lens, fruitful insights may arise about the effects of such differences, such as how design knowledge and design identities are expressed and valued.

This debate on claiming design takes on a political dimension in the public sphere. In a special issue edited by Henry Sanoff on participatory design in the journal *Design Studies*, the democratic ideals of its methods are promoted: 'Participatory design is an attitude about a force for change in the creation and management of environments for people.' (Sanoff, 2007). We suggest that misconceptions by stakeholders of what kind of design is being done are likely to produce clashes beyond conceptions of what is desired in the designed work. When participatory design takes place within a defined discipline, such as information systems design, then the likelihood that this code clash would produce significant hurdles towards shared understanding in design is probably low. However, in urban design and large scale public work projects with a multiplicity of voices and perspectives, this is likely to be a significant problem. Imagine that a local governing agent runs a major public infrastructure project under a knowledge code approach to design and conducts participatory design charettes in which the public is asked to comment on technical matters. If the public's view of design reflects a knower code, its concerns will be based on personal stances towards the project rather than technical, rational or procedural issues. This can lead not only to disagreement and debate, which one would hope would be generated by public discussion, but also disagreement on the very grounds of debate. Rather than having different perspectives on the problem, in this example the governing agent and public would not agree on what they are disagreeing over: they are using competing measures of legitimacy — a code clash. This difference is not generally discussed in a charette; consequently the clash between these codes would prevent the formation of a shared understanding.

This is not simply a hypothetical situation; just such a situation played itself out in Sydney, Australia. On January 16, 2006 the *Sydney Morning Herald* ran an online poll asking its readers, 'Sydney desalination plant: Are you for or against?' Of the 2646 respondents, 81% were against, and 19% were in favour. While not a scientific poll, it is interesting to compare this to a declaration by former Planning Minister Craig Knowles that the design of the Kurnell desalination plant is 'beyond public debate' (Frew, 2005). As was illustrated by the attitudes of many members of the public attending consultation workshops, a clash emerged between the government and large numbers of the people of the state of New South Wales in Australia not only over the desirability of the desalination plant, but over the approach to the design of this project and what is considered legitimate design practice.

The clash of codes need not be a barrier to participatory design or a barrier to designers from across disciplines working together. Rather, we see LCT and its language of description as making explicit what is already known, at least implicitly, by members of the field. In making these differences explicit, we have a means to discuss them. It can provide a basis for understanding what code is operating when and for which practices. What is perhaps most controversial is to what extent design education can dispense with these codes or whether it is important to maintain specific codes within each discipline. Education is never neutral. Nonetheless, design pedagogy should allow students to reconfigure existing traditions and practices which take account of and build upon their profession's knowledge base whilst at the same time integrating their own positions. Making explicit for students this transformation of knowledge of/about design into knowledge about the structuring of knowledge in design could sow the seeds for making transparent the problem of legitimating design.

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