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Designerly ways of speaking: Unpacking the discourse of Design Thinking

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ABSTRACT

Creating knowledge allows research communities to claim intellectual territory. Knowledge created by communities is not wholly evidence based; it is skewed, allowing them to claim territory. Existing research suggests that skewed knowledge helps the Design Thinking research community to construct a contentious dichotomy between Design Thinking and scientific thinking. There remains a significant gap in knowledge on how the community creates territory. This paper reports on an empirical study of journal articles. It uncovers how the processes of classifying key concepts and creating frameworks enable researchers to claim territory. It finds that flawed use of methodology and a lack of coherence may contribute to the acts of classifying concepts and creating frameworks – and therefore the construction of territory. It also finds that focusing on the idea that Design Thinking is 'complex' may allow the community to downplay the need for rigour. These troubling aspects are termed 'Designerly Ways of Speaking'.

KEYWORDS

Design Thinking, design cognition, design knowledge, content analysis, framing, classifying, evaluation, ways of speaking, complexity, academic communities

Introduction

Researchers have been investigating how academic communities construct knowledge for some time. Kuhn (1962), a pioneer in this area of research, analysed how subjects in the natural sciences construct and defend knowledge. He argued that knowledge created by communities is often not based on evidence. Instead, communities invest a great of resource to maintain their reliance on producing knowledge that suits their ends – this process helps the community to strengthen and maintains its domain of expertise. When new knowledge challenges an accepted theory, scholars can go to considerable lengths to dispute the validity of the new knowledge. The community often claim that the emergence of errant new knowledge is due to

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faulty analytical equipment or errors in empirical procedure. Kuhn uses research associated with Newton's Laws of Motion to illustrate his points. Newton's Laws dominated in Physics research in the 18th and 19th centuries, providing the physics community with a secure domain of knowledge. During this time, some researchers noted errors in Newton's Laws. The physics community dismissed research that noted errors, and it was only in the early 20th century when Einstein's theories of relativity became accepted, that scholars accepted that Newton's calculations contain flaws.

More recently, Becher and Trowler (2001) investigated the way in which academic fields construct knowledge. They argue that academic disciplines function as – in their terms – *tribes*.[1] An academic community aims to occupy a territory that is distinctive and separate to territory claimed by other academic tribes. Becher and Trowler use the term *intellectual territory* to describe the domain occupied by academic fields. They argue the manner in which a community speaks or writes helps it cement its claims to knowledge – and therefore its claims to ownership over intellectual territory:

> … the professional language of a disciplinary group plays a key role in establishing its cultural identity. (Becher and Trowler 2001, 46)

Disciplines have specific ways of speaking on knowledge associated with their domain. Historians tend to use the term 'masterly' to commend research (Becher and Trowler 2001, 46); Mathematicians praise a formula by calling it 'elegant' or 'powerful'. The importance of creating intellectual territory means that communities exercise strict tribal control over what counts as knowledge in their field:

> Research articles and other channels of academic communication are sanctioned by a consensus among community members which both constrains the use of particular discursive forms and authorises permitted variations within them. (Hyland 1998, 448)

Academic communities focus on *classification* and creating *frameworks* when constructing territory (Becher and Trowler 2001). The term *classification* refers to describing concepts and their relationships. When classifying ideas, a community uses a distinctive language, a 'particular set of favoured terms [and] sentence structures' (Becher and Trowler 2001, 47) that are specific to it. *Taxonomic* classifications illustrate the use of favoured terms. A taxonomy is described as being:

> … a systematic framework for distinguishing, ordering, and naming types and groups within a subject field. (John, Angleitner, and Ostendorf 1988, 172)

Taxonomies use specialized language in classifying elements and relationships between elements. The system was popularized in biological research, Figure 1 contains a taxonomy of mammals belonging to phylum Chordata.

The use of Latin in Figure 1 makes it difficult for non-members to critique the classification. Specialist language therefore helps safeguard the intellectual territory claimed by a community.

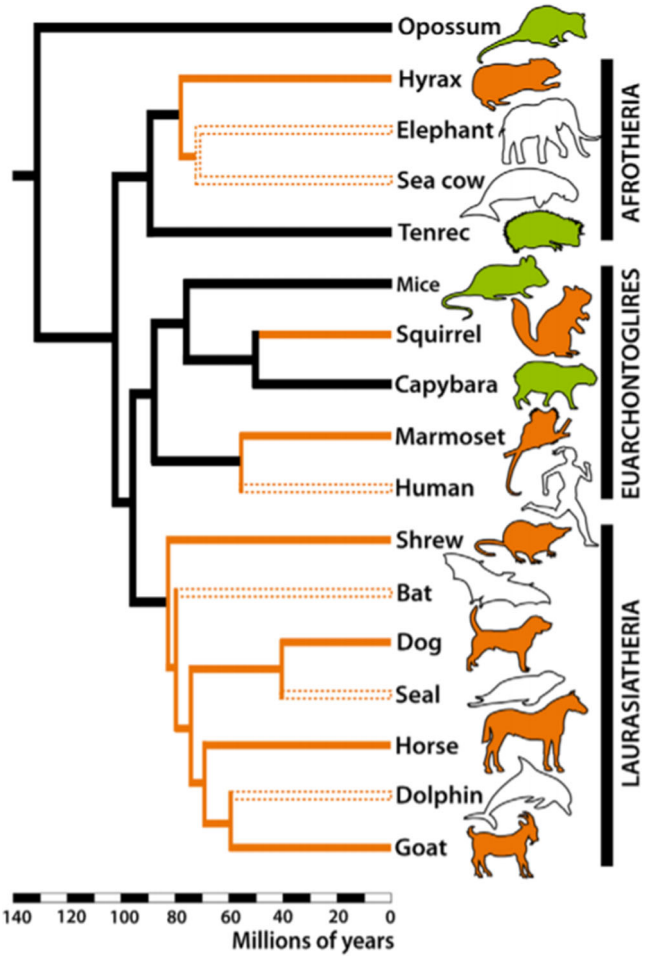

Figure 1. *A taxonomy of clades Eutheria.* Taken from Suarez et al. (2011, 4).

There can be serious negative ramifications to ways of speaking that communities construct. To illustrate, Medical doctors use specialized terminology when classifying illness and disease, allowing them to lay claim to ways of speaking on disease:

> … the moral and metaphysical components of disease and healing are concealed by the use of the natural science model. (Taussig 1980, 5)

This situation can result in patients becoming detached from their own experiences of disease: 'What is revealed to us here is the denial of authorship' (Taussig 1980, 5). The denial of ownership can heighten patient anxiety:

> … medical practice inevitably produces grotesque mystifications in which we all flounder, grasping ever more pitifully for security in a man-made world which we see not as social, not as human, not as historical, but as a world of a priori objects beholden only to their own force and laws, dutifully illuminated for us by professional experts such as doctors. (Taussig 1980, 5)

Academic communities also use specialized language to describe the connection between classifications, helping them construct a *framework* of ideas (Becher and Trowler 2001). The framework reinforces the validity of individual elements, making the process of critiquing territory more difficult. Figure 1 shows a framework of connections between classified elements, this cements the impression that the way the community constructs knowledge is rigorous. Feminist critiques of science problematize the idea of viewing the natural world in this way. As men have traditionally dominated scientific fields, classifications and frameworks are commonly patriarchal constructs that relegate knowledge produced by women:

> If gender segregation is entrenched in a scientific field, as it is in many … then it is to be expected that the questions women ask and the results they generate in the disciplinary niches where they typically work will get less recognition, and will have less impact on the trajectories of research in their fields than do the contributions of men. (Wylie 2012, 66)

Criticisms of classifications and frameworks therefore unpick the claims to knowledge – and ownership of intellectual territory – which help to sustain academic communities. Just as taxonomies help natural scientists to construct their territory, the concept of *Design Thinking* is key to the design research community. Through undertaking a qualitative content analysis of journal papers that focus on Design Thinking, this paper unpicks the discourse produced by the community. The study focusses on how the community classifies Design Thinking and the intellectual frameworks it creates. These aspects provide insight on troubling and hitherto hidden ramifications of *Designerly Ways of Speaking*.

Existing insights into designerly ways of speaking

The term *Design Thinking* refers to the cognitive process used by designers when engaged in problem-solving. Commonly, Design Thinking is argued as enabling practitioners to use iterative steps in generating solutions to a range of problems across disciplines (e.g. Cross 2004). Schön has greatly influenced how the community describes Design Thinking (Cross 2001). Schön (1983) argued that as each design problem is unique, it is impossible to fully comprehend it when initially confronted with it. Design problems instead must be constructed during the design process. Schön claims that to solve them, designers engage in a reflective conversation with issues they face:

> … the [design] situation talks back, the practitioner listens, and as he appreciates what he hears, he reframes the situation once again … (Schön 1983, 131–132)

Lawson is one of many design researchers who have argued that reflective practice helps designers to solve problems:

Table 1. Citations of papers in the data set.

Paper Number	Citations of Papers in the Data Set
Paper 1	Adams, R. S., Daly, S. R., Mann, L. M., & Dall'Alba, G. (2011). Being a professional: Three lenses into design thinking, acting, and being. *Design Studies*, *32*(6), 588–607. https://doi.org/10.1016/j.destud.2011.07.004
Paper 2	Björgvinsson, E., Ehn, P., & Hillgren, P. A. (2012). Design things and design thinking: Contemporary participatory design challenges. *Design Issues*, *28*(3), 101–116. https://doi.org/10.1162/DESI_a_00165
Paper 3	Blizzard, J., Klotz, L., Potvin, G., Hazari, Z., Cribbs, J., & Godwin, A. (2015). Using survey questions to identify and learn more about those who exhibit design thinking traits. *Design Studies*, *38*, 92–110. https://doi.org/10.1016/j.destud.2015.02.002
Paper 4	Börekçi, N. A. (2016). Usage of Design Thinking Tactics and Idea Generation Strategies in a Brainstorming Session. *METU Journal of the Faculty of Architecture*, 32(2), 1–17. http://dx.doi.org/10.4305/metu.jfa.2015.2.1
Paper 5	Bousbaci, R. (2008) "Models of Man" in Design Thinking: The "Bounded Rationality" Episode. *Design Issues*, *24*(4), 38–52. https://doi.org/10.1162/desi.2008.24.4.38
Paper 6	Buchanan, R. (1992). Wicked problems in design thinking. *Design Issues*, 8(2), 5–21. http://www.jstor.org/stable/1511637
Paper 7	Burdick, A. & Willis, H. (2011). Digital learning, digital scholarship and design thinking. *Design Studies*, *32*(6), 546–556. https://doi.org/10.1016/j.destud.2011.07.005
Paper 8	Carlgren, L., Elmquist, M., & Rauth, I. (2014). Exploring the use of design thinking in large organizations: Towards a research agenda. *Swedish Design Research Journal*, *1*(14), 47–56.
Paper 9	Carlgren, L., Elmquist, M., & Rauth, I. (2014) Design thinking: Exploring values and effects from an innovation capability perspective. *The Design Journal*, *17*(3), 403–423. https://doi.org/10.2752/175630614X13982745783000
Paper 10	Carmel-Gilfilen, C. & Portillo, M. (2010). Developmental trajectories in design thinking: an examination of criteria. *Design Studies*, *31*(1), 74–91. https://doi.org/10.1016/j.destud.2009.06.004
Paper 11	Carmel-Gilfilen, C. (2012). Uncovering Pathways of Design Thinking and Learning: Inquiry on Intellectual Development and Learning Style Preferences. *Journal of Interior Design*, *37*(3), 47–66. https://doi.org/10.1111/j.1939-1668.2012.01077.x
Paper 12	Carroll, M., Goldman, S., Britos, L., Koh, J., Royalty, A., & Hornstein, M. (2010). Destination, Imagination and the Fires Within: Design Thinking in a Middle School Classroom. *International Journal Of Art & Design Education*, *29*(1), 37–53. https://doi.org/10.1111/j.1476-8070.2010.01632.x
Paper 13	Cassim, F. (2013). Hands On, Hearts On, Minds On: Design Thinking within an Education Context. *International Journal Of Art & Design Education*, *32*(2), 190–202. https://doi.org/10.1111/j.1476-8070.2013.01752.x
Paper 14	Cheung, M. (2012). Design Thinking in Healthcare: innovative product development through the iNPD process. *The Design Journal*, *15*(3), 299–324. https://doi.org/10.2752/175630612X13330186684114
Paper 15	Cusens, D. & Byrd, H. (2013). An Exploration of Foundational Design Thinking Across Educational Domains. *Art, Design & Communication In Higher Education*, *12*(2), 229–245. http://dx.doi.org/10.1386/adch.12.2.229_1
Paper 16	Dalsgaard, P. (2014). Pragmatism and Design Thinking. *International Journal of Design*, *8*(1), 143–155.
Paper 17	Dorner, D. (1999). Approaching Design Thinking Research. *Design Studies*, *20*(5), 407–415. https://doi.org/10.1016/S0142-694X(99)00023-X
Paper 18	Dorst, K. (2011) The Core of 'Design Thinking' and its Application. *Design Studies*, *32*(6), 521–532. https://doi.org/10.1016/j.destud.2011.07.006
Paper 19	Fontaine, L. (2014). Learning Design Thinking by Designing Learning Experiences: a case study in the development of strategic thinking skills through the design of interactive museum exhibitions. *Visible Language*, *48*(2), 48–69.
Paper 20	Galle, P. & Kovács, L. B. (1996). Replication Protocol Analysis: a method for the study of real-world design thinking. *Design Studies*, *17*(2), 181–200. https://doi.org/10.1016/0142-694X(95)00039-T
Paper 21	Goldschmidt, G. (1994). On Visual Design Thinking: the vis kids of architecture. *Design Studies*, *15*(2), 158–174. http://dx.doi.org/10.1016/0142-694X(94)90022-1
Paper 22	Goldschmidt, G. & Rodgers, P. A. (2013). The Design Thinking Approaches of Three Different Groups of Designers Based on Self-Reports. *Design Studies*, *34*(4), 454–471. https://doi.org/10.1016/j.destud.2013.01.004
Paper 23	Gray, C.M. (2013). Factors That Shape Design Thinking. *Design and Technology Education: an International Journal*, *18*(3), 8–20.

(*continued*)

Table 1. Continued.

Paper Number	Citations of Papers in the Data Set
Paper 24	Gray, C.M & Siegel, M.A (2014). Sketching Design Thinking: Representations of design in education and practice. *Design and Technology Education: an International Journal*, *19*(1), 48–61.
Paper 25	Hadjiyanni, T. & Zollinger, S. (2013). Writing in Design Thinking–Deconstructing the Question of Being. *International Journal of Architectural Research*, *7*(1), 116–127.
Paper 26	Ho, C. H. (2001). Some Phenomena of Problem Decomposition Strategy for Design Thinking: differences between novices and experts. *Design Studies*, *22*(1), 27–45. https://doi.org/10.1016/S0142-694X(99)00030-7
Paper 27	Kangas, K. Seitamaa-Hakkarainen, P. & Hakkarainen, K. (2013). Design Thinking in Elementary Students' Collaborative Lamp Designing Process. *Design and Technology Education: an International Journal*, *18*(1), 30–43.
Paper 28	Kimbell, L. (2011). Rethinking design thinking: Part I. *Design and Culture*, *3*(3), 285–306. http://dx.doi.org/10.2752/175470811X13071166525216
Paper 29	Kimbell, L. (2012). Rethinking design thinking: Part II. *Design and Culture*, *4*(2), 129–148. http://dx.doi.org/10.2752/175470812X13281948975413
Paper 30	Liu, Y. T. (1996) Is Designing One Search or Two? A Model of Design Thinking Involving Symbolism and Connectionism. *Design Studies*, *17*(4), 435–449. https://doi.org/10.1016/S0142-694X(96)00018-X
Paper 31	Louridas, P. (1999). Design as Bricolage: anthropology meets design thinking. *Design Studies*, *20*(6), 517–535. https://doi.org/10.1016/S0142-694X(98)00044-1
Paper 32	Orthel, B. D. (2015). Implications of Design Thinking for Teaching, Learning, and Inquiry. *Journal of Interior Design*, *40*(3) 1–20. https://doi.org/10.1111/joid.12046
Paper 33	Owen, C. (2007). Design Thinking: Notes on its nature and use. *Design Research Quarterly*, *2*(1), 16–27.
Paper 34	Oxman, R. (2004). Think-maps: teaching design thinking in design education. *Design Studies*, *25*(1), 63–91. https://doi.org/10.1016/S0142-694X(03)00033-4
Paper 35	Pauwels, P., De Meyer, R. & Van Campenhout, J. (2013). Design Thinking Support: Information systems versus reasoning. *Design Issues*, *29*(2), 42–59. https://doi.org/10.1162/DESI_a_00209
Paper 36	Poulsen, S.B. & Thøgersen, U. (2011). Embodied Design Thinking: A phenomenological perspective, *CoDesign*, *7*(1), 29–44. https://doi.org/10.1080/15710882.2011.563313
Paper 37	Scheer, A., Noweski, C., & Meinel, C. (2012). Transforming Constructivist Learning into Action: Design thinking in education. Design and Technology Education: *An International Journal*, *17*(3), 8–19.
Paper 38	Senturer, A., & Istek, C. (2000). Discourse as Representation of Design Thinking and Beyond: Considering the Tripod of Architecture–Media, Education, & Practice. *International Journal Of Art & Design Education*, *19*(1), 72–85. http://dx.doi.org/10.1111/1468-5949.00204
Paper 39	Teal, R. (2010). Developing a (Non-linear) Practice of Design Thinking. *International Journal Of Art & Design Education*, *29*(3), 294–302. https://doi.org/10.1111/j.1476-8070.2010.01663.x
Paper 40	Tonkinwise, C. (2011). A Taste for Practices: Unrepressing style in design thinking. *Design Studies*, *32*(6), 533–545. https://doi.org/10.1016/j.destud.2011.07.001
Paper 41	Vanada, D. I. (2014). Practically Creative: The Role of Design Thinking as an Improved Paradigm for 21st Century Art Education. *Techne Series-Research in Sloyd Education and Craft Science A*, *21*(2), 21–33.
Paper 43	Wang, J. (2013). The Importance of Aristotle to Design Thinking. *Design Issues*, *29*(2), 4–15. https://doi.org/10.1162/DESI_a_00206
Paper 43	Wu, J.C. Chen, C-C., & Chen, H.-C. (2012). Comparison of Designer's Design Thinking Modes in Digital and Traditional Sketches. *Design and Technology Education: an International Journal*, *17*(3), 37–48.
Paper 44	Wylant, B. (2010). Design Thinking and the Question of Modernity. *The Design Journal*, *13*(2), 217–231. https://doi.org/10.2752/175470710X12735884220970
Paper 45	Wylant, B. (2008). Design Thinking and the Experience of Innovation. *Design Issues*, *24*(2), 3–14. http://dx.doi.org/10.1162/desi.2008.24.2.3

the more experienced final year architecture students consistently used a strategy of analysis through [problem] synthesis. They learned about the problem through attempts to create solutions rather than through deliberate and separate study of the problem itself. (Lawson 2005, 44)

Commonly, the community argues that this problem-solving approach is advantageous. Dorst (2010) claims that design solutions emerge progressively:

> [Designers] know that bringing the full force of evaluation to bear upon a fledgling idea is a very effective way of killing it, blocking any further exploration and stifling any progress in the project. (Dorst 2010, 133)

Commonly, the community claims use of Design Thinking helps designers to tackle *wicked* problems (Rith and Dubberly 2007). Rittel and Webber (1973) first describe wicked problems, applying the concept to town planning issues. Design researchers commonly argue that many design problems are wicked (Cross 2011; Downton 2003).

Characteristically, the community describes Design Thinking as contrasting with problem-solving methods used in the natural sciences (Cross 2004, 2011; Dorst 2011, 2010). Cross (2004) claims that scientists identify a problem fully then solve it. For Cross (2004, 2011) this chain sequence implies that scientific problem solving is *linear* in nature. Many design researchers claim that this linear, problem-focused way of thinking limits both exploration of problems and idea generation, resulting in unsatisfactory solutions (e.g. Cross 2004, 2011; Dorst 2010; Oxman 2002). Characteristically, therefore, the community claims that designers are better at tackling wicked problems than scientists (Farrell and Hooker 2013).

The above discussion summarizes a common notion in design research – namely that there is a dichotomy between scientific thinking and Design Thinking. Maciver et al. (2016) illustrate this dichotomy (Figure 2), suggesting that designers use the *left* hemisphere of the brain whilst scientists use the *right* side; scientists employ *logic*, whilst designers use *intuition*.

The dichotomy suggests that the community is secure in its description of Design Thinking – and therefore of associated intellectual territory. Some researchers however contest the security of this position. Kimbell (2011, 292) claims that the community has yet to 'generate a definitive or historically informed account of design thinking'. Flawed methods of analysing data means that it is necessary to question the 'factual reliability and objectiveness of … descriptions of the occurrence of Design Thinking [meaning it impossible to] determine whether or not design thinking is [taking place]' (Hassi and Laakso 2011, 2). Of specific relevance to this paper, research problematizes the role that the concepts of reflective practice and wicked problems play in enabling the community to construct its territory.

Reflective practice

An analysis of how Schön citations are used in design research finds that they are often used to legitimate researchers' own practices:

Sciences	*Arts*
Mathematics, physics, engineering	Creativity, language
Logic	Intuition, subjectivity
Left brain	Right brain
Linear, sequential	Holistic, chaotic, divergent
Reductionist enquiry	Naturalistic enquiry
Facts, figures, formulae	Interpretive forms, subjective expression
One correct answer	Many solutions
Technologists - computer scientists, software engineers, information science experts, coders...	***Designers*** - product designers, interface designers, design researchers, graphic designers...

Figure 2. The dichotomy between scientific thinking and Design Thinking. Taken from Maciver et al. (2016, 3).

> [the action of citing Schon] supports [researchers'] own research topics, methods or methodologies, arguments. (Beck and Chiapello 2016, 9)

Beck and Chiapello (2016, 10) argue that often the mention of reflective practice is accompanied by a 'lack [of] any explanation or discussion' on what this term may indicate. Furthermore, scholars make 'uncritical use' of Schön's work (Beck and Chiapello 2016, 9). These patterns 'potentially undermine attempts' to fully investigate, challenge and learn more about Schön's concept (10), thereby limiting the community's potential for intellectual growth. Beck and Chiapello question whether there is an appetite within the community for critiquing key ideas:

> … are scholars publishing at the DRS conference are [*sic*] less interested in argumentation cumulative knowledge building? (Beck and Chiapello 2016, 12)

As noted, Schön's concept of reflective practice has been fundamental in enabling the community to construct classifications of Design Thinking. The lack of critique of Schön's ideas may therefore be a sign of a community regulating discursive forms in order to sustain its intellectual territory, allowing it to maintain a separation from natural scientific research communities. Potentially, this action erodes the security of the territory the community claims is associated with Design Thinking (Ghassan 2019a).

Miller (2010, 5) argues that academic communities should critique and evaluate the validity of their belief systems through 'figur[ing] out what is wrong with their own ideas, and not what is right about them.' Miller however identifies a lack of introspection in design research:

> Design is trying to prove itself, rather than disprove itself. It is the latter, though, that will serve the social good.

Equally, the ways in which the community speaks on Schön's concept of reflective practice suggests that it may be more concerned with maintaining the received description of Design Thinking rather than engaging in healthy critique of its underlying principles.

Wicked problems

The idea that designers are better suited to solving wicked problems than scientists is a key part of the community's discourse. Farrell and Hooker (2013, 683) challenge this notion, claiming it is 'fundamentally flawed'. They argue that scientists commonly solve wicked problems. To illustrate their position, they claim that negotiation between stakeholders was key in allowing natural scientists to diagnose *chronic fatigue syndrome*:

> It was … initially unclear whether chronic fatigue syndrome was caused by a bacterium or virus, a fungus or mould, in each case perhaps deeply embedded in tissue, or was due to a psycho-somatic condition, with any of these options difficult and resource demanding to pursue. Then, just as with design, the issue becomes which few of these possibilities is currently most worth pursuing and in which specific forms. Various options will be developed in more detail, their resource demands and risks analysed and their merits spelled out for consideration. During that process more specific versions of the initial general problem will be developed, some of them (e.g. the psycho-somatic option) perhaps requiring a significant reformulation of both what the problem is and what criteria a solution would need to meet. A critical debate will develop about these options, the upshot being that one or two of them will be selected to pursue, perhaps by individual laboratories, perhaps as cooperative ventures. (Farrell and Hooker 2013, 688–689)

There is an intrinsic relationship between the way designers and scientists think, for both are the 'product of a common core cognitive process' (Farrell and Hooker 2013, 701). Farrell and Hooker (2013, 701) claim the description of scientific thinking commonly found in design research lacks rigour and that scholars should become more critical and 'widen their outlook and reflect on their practices'. The lack of critique identified by Farrell and Hooker may signal that the community is steering classifications and frameworks associated with Design Thinking to sustain its intellectual territory in favour of undertaking important critique on key issues (Ghassan 2019b).

The existing critiques associated with reflective practice and wicked problems highlight the importance of investigating ways of speaking that help to maintain the intellectual territory claimed by the community. There is however a large gap in knowledge in this area (Ghassan 2019a, 2019b). The little research that has been undertaken on this issue (for example that of Kimbell 2011) tends not to use empirical methods specifically designed for undertaking analysis of texts; nor does it frame the investigation around academic

communities and their intellectual territories. Exceptions include Beck and Chiapello (2016) aforementioned study on Schön citations that touches upon this area. Beck and Chiapello's study however only analyses conferences papers. Conference papers often represent initial contributions that are then cemented in journal articles. Design journal papers are therefore viewed as being more definitive contributions to the community (Mansfield 2016). In contributing to filling the gap in the knowledge, this paper employs qualitative content analysis to investigate the discourse contained within a data set of journal articles that focus on Design Thinking.

Method

Qualitative content analysis[2] is commonly used to uncover ways of speaking produced by communities. It necessitates close reading of textual data and allotting portions of text (termed *meaning units*) into *theoretical categories* (often just termed *categories*) (Graneheim and Lundman 2004). The categories represent ways of speaking found in the data set, functioning as a 'translation device' that allow systematic analysis. The term *coding* refers to the process of translating textual data into categories (Graneheim and Lundman 2004). Categories that contain similarities are grouped into more substantive *themes* (Joffe and Yardley 2004); uncovering coherent patterns and identifying cohesive narratives provides insights into the discourse (Larsson 2009). Identifying cohesive narratives is more valuable than quantifying findings when researching discourse produced by communities (Joffe and Yardley 2004).

The study was open-ended, it did not test a particular hypothesis. Coding therefore proceeded via the inductive paradigm (Graneheim and Lundman 2004). It began with a process of coding text from a variety of perspectives. During this process – termed *open coding* – 'categories [were] freely generated' (Burnard 1991, 462). Categories developed during this process were viewed as drafts that were refined through iterative cycles of coding (Gale et al. 2013). The qualitative nature of the study meant that analysis relied on the author interpreting discourse contained within textual data. An independent researcher evaluated the author's categories, helping to reduce limitations that are inherent with qualitative analysis (Hsieh and Shannon 2005).

The data set

As Design Thinking is central in design research, it is potentially possible to analyse ways of speaking found in a huge range of papers, books or book chapters. It is impossible to undertake in-depth analysis of this information. Furthermore, analysing texts that mention Design Thinking in passing would dilute the study's effectiveness. It is more valuable to create a smaller,

homogenous data sample that focusses on the investigative domain (Guest, Bunce, and Johnson 2006). Creating a homogenous sample necessitated analysing papers that focus on Design Thinking. Only papers including the term 'Design Thinking' in the title were included in the sample. This strategy was used as researchers tend to rely on article title as the 'main source of information' for judging article relevance (Jamali and Nikzad 2011, 653). Technology also supports searches conducted by article title.[3] The study analysed journals papers; there is currently no definitive list of design journals (Gemser et al. 2012; Mansfield 2016). Indeed, creating lists of design journals is 'notoriously difficult and [the results are] always controversial' (Mansfield 2016, 903). This is because design research is both interdisciplinary and a relatively young field (Gemser et al. 2012). To illustrate the issues with creating a list of design journals, it is valuable to reflect on studies that have attempted to do this. Gemser et al. (2012) poll design academics. The disciplinary field in which the academics specialize influenced their choice of key journals:

> … respondents with an academic background in humanities seem to prefer arts-related design journals, those with a background in social and behavioral sciences seem to prefer ergonomics-related journals, while those with a design-related background seem to prefer in particular general design journals. (Gemser et al. 2012, 20)

Use of peer recommendation may therefore lead to a very broad data set, potentially diluting the sample and excessively limiting the value of findings. In contrast, other methods of creating a list of journals may lead to an overly narrow sample. One such method uses *impact factor* (Gemser et al. 2012). This method would have been problematic as 'most journals in the [design] field … have no measured impact factor' (Gemser et al. 2012, 20). This fact greatly limits the choice of journals, potentially creating a very narrow data sample.

In this study, the list of design journals included those with a remit of *design*, *design and art*, and *design and architecture*, reflecting the traditional interdisciplinary roots of design as cemented at the Staatliches Bauhaus (Gropius 1935). The focus on including art and architecture with design in faculties is still commonplace today in many universities, including the author's place of work. The study does not include papers published in journals whose remit combines *design* with *engineering*. This decision results from the aforementioned idea that design researchers create a distinction between Design Thinking and scientific thinking. The decision to exclude papers published in design engineering journals underscores the difficulty associated with creating a data set whose purpose is to uncover ways of speaking in a multidisciplinary discipline like design research. The approach did however create favourable parameters for a data sample that was neither overly wide nor excessively narrow.

Only peer-reviewed articles were included in the data set as they are 'socially validated' as a valid source of knowledge (Cope and Kalantzis 2009, unpaged).[4] The data search identified 45 suitable papers from 16 journals.[5] The papers span nearly 25 years of Design Thinking research. They are published in both broad-remit, large circulation journals like *Design Studies* and specialist remit, low circulation journals like *Techne Series-Research in Sloyd Education and Craft Science 'A'*. Design research is characterized by the presence of both types of journals (Mansfield 2016). The data set contains the work of researchers who are based in a range of locations including, the UK, USA, Scandinavia, China, Australia and South America. Academics working in 12 research areas contribute to the 45 papers in the data set. Areas include Design, Education, Psychology, Human Computer Interaction, Engineering Media and Physics. The data set is therefore broadly representative of the global and interdisciplinary community of Design Thinking research. Findings gleaned from analysing it can therefore be argued to broadly represent Designerly Way of Speaking.

The qualitative content analysis involved an investigation of full papers.[6]

Results

Below, the results are presented in two sections, those linked to the practices of *classifying* and *framing* Design Thinking.

Classifying design thinking

The category 'Defining and Categorizing Design Thinking' includes all instances in which researchers classify Design Thinking. There is sustained focus on classifying Design Thinking – this is to be expected given the impetus in academia for classifying key concepts (Becher and Trowler 2001). Reflecting on *how* papers classify Design Thinking provides insight into the discourse produced by the community. When constructing descriptions of Design Thinking, researchers expand on a series of cognitive steps that they claim are associated with it. Characteristically, researchers claim that Design Thinking involves an iterative combination of steps: *creative designing rests on a cyclic combination of abductive, deductive, and inductive reasoning processes.* (Paper 35) and *Not all the [Design Thinking] steps are sequential … but they must take place.* (Paper 21). The presence of detailed sub-classifications of Design Thinking provides the initial impression that researchers have excellent knowledge of the process – and consequently that the intellectual territory is secure.

Researchers create classifications that resemble taxonomies, using specialized terminology to classify discrete elements and the relationship between them. To illustrate, one paper structures description of Design Thinking

around four themes: perception of the concept, how it is used, integration of DT with existing product development, and who is using DT. (Paper 8). Another identifies *three major themes* (Paper 12) when investigating the design process: Design as Exploring; Design as Connecting; Design as Intersecting. A further paper differentiates between … *design practices that address problems within an existing frame (Abduction-1) [and] design practices that involve framing (Abduction-2)* (Paper 18). Researchers often describe how designers move between sub-classifications of Design Thinking. In the following example, the terms *working forward* and *working backwards* describe different Design Thinking steps:

> [the designer] tended to choose working-forward strategies to search in a fixed direction. Only when he had trouble in his search would he adopt a working-backward search strategy to evaluate the situation. (Paper 26)

Another paper claims that when designers move from considering, *the immediate problem to a wider consideration beyond the problem,* they engage in:

> … movement from a solution-focused design approach to one that is problem-focused, and a change in agency for who defined the problem and evaluated the design from others to oneself. (Paper 1)

Highlighting their ability to understand subtle shifts in Design Thinking helps researchers to reinforce the validity of individual classifications, cementing a sense of rigour and further underscoring the idea that the territory is secure. This pattern in creating classifications echoes the practice seen in taxonomies. Some descriptions of shifts between classifications resemble mathematical equations – as illustrated by the following examples. To engage successfully in the design process, an author argues that students should create a 'Point of View Statement': *The formula for Point of View formula is: User + Need + Insight = Point of View Statement.* (Paper 12). Similarly, another paper presents the following equation-like description, detailing how designers move between Design Thinking phases:

> From P -+ Q
>
> and Desirable –7 Q
>
> conclude Desirable ~ P
>
> (where "-q' reads 'not').
>
> (Paper 20)

Reflecting on other categories provides additional avenues to discuss how researchers speak on the security of the territory. The category 'Long Established History' contains instances in which researchers claim that there is a well-documented history of research on Design Thinking. Consistently

researchers claim this is the case: investigation on Design Thinking *has been the subject for design research for some time.* (Paper 36); *Researchers have long been interested in design thinking* (Paper 4). Claiming that inquiry into Design Thinking is long established helps researchers to cement the idea that classifications are rigorously described, and consequently that the territory is secure.

The category 'A Community of Designers' contains instances in which researchers argue that designers share ways of thinking. Consistently, papers claim this to be the case. Researchers claim that their descriptions of thinking styles are broadly applicable amongst designers. To illustrate, one paper claims *Designers can effortlessly see a great number of possibilities from the graphic representation of any states of the human design process.* (Paper 30); another paper argues *that designers have similar searching procedure in searching design strategy in applying digital and traditional media.* (Paper 43). The process of constructing a large group of people who share cognitive abilities has positive connotations for the territory. Firstly, it widens the scope of Design Thinking, making it seem more important and useful than if it were applicable to only a small group of people. It also makes the intellectual territory appear established and therefore secure.

Questioning the security of the intellectual territory

Reflecting on methods that allow researchers to create classifications cast doubt on whether the territory is secure. Consistently, descriptions of how designers think come from analysis of problem solving undertaken by an extremely small number of designers. Paper 36 analyses the role that designers' bodies play in Design Thinking. In-so-doing, it investigates the practices of 3 designers, *an experience designer … an interaction designer … a design ethnographer*. The papers claims that observation of these 3 designers allows insight into how *all* designers work:

> The conclusion to our study is that the lived body is actively engaged in the sensemaking process and functions as the foundation for a designer's interaction and thinking on several connected levels. (Paper 36)

It is highly unlikely that observations of just three designers can allow insight into the actions of all designers, especially when design practices are so varied across the many different design disciplines. Similarly, Paper 26 makes broadly applicable claims on how all designers think from observing how two designers work; equally, Paper 21 argues that very broad insight can be gained from analysing one individual. Researchers in the data set do not note the limitations of making broadly applicable claims that are inherent when analysing very small samples. Conversely, they narrate the validity of their findings. Paper 21 states:

> Whereas the case study we presented may be somewhat out of the ordinary, the underlying trends of systematic visual thinking it exemplifies so cogently are practically universal

Claims therefore appear to emerge from use of questionable methodology. The lack of rigour makes it difficult to accept the validity of the classifications. The lack of rigour also provides an initial basis to question how well established the intellectual territory is. There is an addition reason to question the validity of the classifications – they differ from paper to paper. As seen in the examples provided in this section, researchers vary with regards to the number of Design Thinking themes they claim to define, describing *four themes* (Paper 8) *or three major themes* (Paper 12). In addition, the use of terminology is not consistent among papers. Different researchers describe the *first phase* (Paper 21) of the design process, the idea that designers *use working-backward strategy* (Paper 26) to solve problems and *the domain of fourth-order design thinking* (Paper 13). These inconsistencies suggest that researchers make claims subjectively. The combination of a lack of rigour in method and inconsistent classifications call into question the legitimacy of the ways in which researchers classify Design Thinking. The data set appears to be more focused on laying claim to intellectual territory than it is on rigorous use of methods and providing coherent argumentation.

Classifying design thinking

Without exception, the data set frames Design Thinking as being beneficial in society. Researchers claim there to be agreement within the community as to the value of Design Thinking. To illustrate, *Many in the Design Thinking community [see the value of] design methods and cognition in the face of global-scale challenges* (Paper 7). The focus in the data set on narrating the benefits of Design Thinking is such that this way of speaking gave rise to 2 categories. 'Design Thinking is Beneficial' contains instances in which papers describe how Design Thinking positively affects learners or users. For example, *exposure to design thinking … made a powerful impression upon the groups of design students* (Paper 34). A further category titled 'Exceptional Benefits of Design Thinking' is characterized by the use of highly emotive ways of speaking when describing the process as a force for good. Hyperboles like *transform societies*, *essential role* and *all men and women* feature in data that was coded into this category. For example, Design Thinking *has the power to transform societies* (Paper 15), plays an *essential role in human development* (Paper 27) and *all men and women may benefit from an early understanding of the disciplines of design in the contemporary world* (Paper 6). The total emphasis on positivity parallels the premise that the

domain is established. Together, these points cement the perceived security of the intellectual territory within the community.

A focus on 'complexity'

The categories 'Design Thinking is Beneficial' and 'Exceptional Benefits of Design Thinking' focus on the idea that both contemporary working and personal life are *complex* and that Design Thinking helps to negotiate these complexities. To illustrate, *design problems are seldom fully defined* (Paper 15); Design Thinking offers *great value to teams dealing with complex, ill-formed problems* (Paper 33); *teachers [can use] design thinking … as a problem solving tool for the design challenges they face every day.* (Paper 41). Beyond its use in professional domains, Design Thinking can help people to solve commonly occurring problems in their everyday lives – in *the increasingly complex world of the twenty-first century* (Paper 12). The practice of framing designers also allows researchers to frame Design Thinking. This is because designers are perceived as being able to use Design Thinking. Given the emphasis on positivity, one may expect that papers would frame designers as people who practice complex thinking. This is indeed the case. In the aforementioned category 'A Community of Designers', researchers argue that designers can focus on both wider issues and problem specifics. Terms like *dynamic and varied*, *holistic* and *big picture* enable researchers to create their frameworks: designers can comprehend *the dynamic and varied contextual scope of problems* (Paper 45), *approach[]complex phenomena in a holistic constructivist manner* (Paper 37) and *keep … the big picture in mind while focusing on specifics* (Paper 33). Researchers claim that designers' ability to negotiate complexity allows them to envisage new ways of seeing the world. Use of terms such as *unchartered territories, new model and entirely new services* underscore this point: *Design thinkers are expected to constantly challenge the boundaries of known solutions and venture to unchartered territories* (Paper 22); *By integrating design, the Vectors team has created a new model for scholarly production.* (Paper 7); designers envisioned *entirely new services, for example a genetic test data bank.* (Paper 29).

The focus that the data set places on framing Design Thinking as *complex* is significant as it allows researchers to mitigate the presence of incoherent classifications. To illustrate, one paper claims that the presence of very different definitions represent the *complex human reality* that is intrinsic to Design Thinking:

> Multiple models of design thinking have emerged … based on widely different ways of viewing design situations and using theories and models from design methodology, psychology, education, etc. Together, these streams of research create a rich and varied understanding of *a very complex human reality*. (Paper 18, emphasis added)

Similarly, another paper argues that the complex nature of Design Thinking means that it continues to *elude reduction* via definition:

> Despite efforts to discover the foundations of design thinking in the fine arts, the natural sciences, or most recently, the social sciences, *design eludes reduction* and remains a surprisingly flexible activity. (Paper 6, emphasis added)

A further paper suggests it would be limiting for the community to accept a definitive definition of Design Thinking:

> Just as there are various terms for design thinking, there are multiple definitions for each of these terms. This ambiguity should be embraced; *a constant definition is not necessarily needed, or even desirable*. (Paper 3, emphasis added)

Terms like *very complex human reality* help to sustain the idea that research methods are rigorous, in turn adding perceived weight to the idea that the territory is secure. Within the community, the notion of *complexity* therefore foregrounds the value of Design Thinking. Concurrently, speaking on complexity helps to sustain the idea that coherent classifications and consistency between researchers limit the intellectual advancement of the research community. Ways of speaking associated with 'complexity' therefore background signs of inconsistency and the presence of flawed empirical methods.

Discussion

Cross (2001) has argued that in order to create secure intellectual territory, the design research community must demonstrate rigour. To do this, Cross (2001) suggests that researchers should use investigative practices developed by more established domains:

> [more established research cultures] have much stronger histories of enquiry, scholarship and research than we have in design. We need to draw upon those histories and traditions where appropriate … We have to be able to demonstrate that standards of rigour in our intellectual culture at least match those of the others. (Cross 2001, 54)

Researchers in the data set create intricate descriptions of Design Thinking steps that help them to claim knowledge. Echoing Cross (2001) suggestion, these classifications are often presented in ways that resemble those seen in more established research cultures – taxonomic-like ones seen in the natural sciences or formulae-like descriptions found in mathematics. These methods of classification can be viewed as attempts to present knowledge in ways that appear rigorous. However, the study highlighted that researchers make broadly applicable claims from investigating extremely small samples of designers. This casts doubt over the validity of the classifications. As previously noted, existing literature raises concerns over methods of investigation;

Hassi and Laakso (2011) argue they are characteristically unreliable, but do not expand on why this may the case. In raising the issue of sample sizes, this paper highlights one such reason. The presence of a range of inconsistent classifications casts further questions over rigour. Both of these points suggest that the intellectual territory is far less established than the data set claims it to be. Designerly Ways of Speaking therefore seem to be more focused on claiming secure intellectual territory than they are on using rigorous methods in describing it.

The study identified the role that the idea of 'complexity' plays in allowing researchers to sustain the territory. In claiming Design Thinking can tackle complex problems, researchers highlight its value; in claiming that designers can practice complex thinking, researchers underscore the value of designers – who in turn practice Design Thinking. Speaking on complexity foregrounds positive narratives while downplaying the need to question empirical methods used by researchers. In addition, the idea of complexity mitigates the need for consistent or agreed definitions of Design Thinking. The notion of complexity may therefore help to sustain and propagate incoherence in Design Thinking research.

Designerly Ways of Speaking therefore appear focused on disseminating positive descriptions of Design Thinking while mitigating a lack of rigour and consistency. Miller's (2010) already-noted argument may ring true – design research appears to be trying to prove itself, when attempting to disprove itself would be of more benefit to society and to the investigative community.

Conclusion

Use of qualitative content analysis has highlighted how the Design Thinking research community constructs classification and frameworks in order to create intellectual territory. The findings are extremely concerning; Designerly Ways of Speaking appear contingent on presenting the practice as beneficial and complex while downplaying incoherence and the need for empirical rigorous research.

Qualitative approaches are limited by being interpretive; far more research on Designerly Ways of Speaking is needed to help fill the vast gap in knowledge in this area; it will provide a fuller understanding of claims made by the community and their ramifications.

Notes

1. Use of qualitative content analysis has highlighted how the Design Thinking research community constructs classification and frameworks in order to create intellectual territory. The findings are extremely concerning. Designerly Ways of Speaking appear Indeed, Becher and Trowler's (2001) book is titled *Academic Tribes and Territories*.

2. Alongside *qualitative content analysis*, other procedures that enable qualitative analysis of text-based data. The term *thematic analysis* (Joffe and Yardley 2004) and *applied thematic analysis* (Guest, MacQueen, and Namey 2012) describe procedures in which text is categorized in order to qualitatively analyse ways of speaking. These descriptions are therefore similar to that of content analysis. Indeed, the terms appear interchangeable:

   Qualitative content analysis and thematic analysis are two commonly used approaches in data analysis of nursing research, but boundaries between the two have not been clearly specified. In other words, they are being used interchangeably and it seems difficult for the researcher to choose between them. (Vaismoradi, Turunen, and Bondas 2013, 398)

   To maintain consistency, the term *qualitative content analysis* is used to describe the method used in this paper.
3. When using online search engines to hunt for articles, it is necessary to input terms that are relevant to the research domain. Search engines tend to prioritize hunting for articles that contain these terms in the article title (Nagano 2015). Users are more likely to access these results than results further down the results list (Nagano 2015). These results are therefore more likely to contribute to the discourse of an academic community than articles that are found further down the list. To optimize the search for data, the study made use of two search engines: 'Google Scholar' and an academic search engine that is only available to staff or students at the author's institution. Use of two search engines helped the author to find articles that either one of the search engines may have missed. The search for peer-reviewed journal articles was undertaken between 30th June and 7th July 2016.
4. Peer-reviewed research is therefore more legitimately representative of knowledge produced by an academic community than discourse found in material that has not been peer-reviewed (Cope and Kalantzis 2009). Features such as editorials were discounted from inclusion in the data set as they are not peer reviewed.
5. The references for the papers in the data set are found in Table 1.
6. Findings associated with the analysis of abstracts from papers in the data set have been published elsewhere (Ghassan 2019a).

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