Dialogues with Data: Generating theoretical insights from research on practice in higher education

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Abstract

There is an identified need in HE research for methods which have the capacity to generate conceptual insights grounded in concrete local practice but with wider applicability in understanding and facilitating research-based change. This Chapter outlines an intermediate approach to qualitative data analysis which can support theoretical knowledge advancement from practice-based research, which I call the *difference-within-similarity approach*. It involves a particular way of conducting dialogues with our data: of interanimating similarities and differences within our qualitative data sets. The approach outlined involves first identifying a similarity, then systematically examining differences within that similarity to generate theoretical explanations. Drawing on sociocultural theorising, particularly dialogic theory and cultural-historical activity theory, the approach is based on the idea that new meanings arise from a comparison of multiple perspectives on a 'same' phenomenon. The tensions between such perspectives are seen as a key driver for change in educational practice. Therefore, articulating and examining such tensions in our data gives an opportunity to simulate the possibility of change in our analysis and, hence, develop insights which can inform change beyond local settings. Important here is that the differences examined are bound together by an analytically productive similarity. Through multiple research examples, the Chapter identifies and illustrates a range of ways of articulating productive analytical similarities for comparison in our data: through theory/literature, through forward and backwards processing of data itself, and through a process termed 'weaving'.

KEY WORDS: Qualitative data analysis, Difference-within-similarity approach, Practice-based research methods; Pedagogic change in higher education; Educational dialogue

Introduction

This Chapter puts forward a simple proposition. It observes that in research on teaching, learning and student experience in higher education (HE), we often prioritise either similarities, *or* differences, identified in our data analysis. I propose that one beneficial analytical approach to understanding and facilitating research-based change in educational practice involves integrating them together in a particular way: approaching our data through first identifying a similarity, then identifying differences *within* that similarity. I will call this simply the *difference-within-similarity* approach. This kind of analytical engagement already happens in research. This Chapter aims to make the analytical processes involved in qualitative research more transparent, developing the proposed approach in a systematic way.

The proposed approach is not just a technique, but sits at the intermediate level between overall methodology and coding. It is about *simulating reality in qualitative data analysis*, so that we can say something about opportunities for change in that social reality (and not just something about our

data). It will be argued that this requires dialogue with our data. Dialogue involves identifying and examining multiple possibilities of the 'same' phenomenon. It is through holding together and comparing multiple possibilities in a dialogic space that new conceptual insights can emerge (cf. Wegerif et al., 2020). Moreover, the process of analytically examining tensions and contradictions brings to light the possibility of change (Engeström & Sannino, 2010). In this Chapter, I characterise a systematic way of analytically 'holding the differences together' in order to go beyond the specificity of local settings and interventions, to generate broader conceptual insights about educational practice and change.

I will first present the case for my approach, before introducing the principle. The discussion then situates the argument in sociocultural theory, and cultural-historical activity theory (CHAT), while highlighting the centrality of comparison in qualitative analyses. In the remaining Chapter, I draw on a range of research examples to outline and illustrate the approach and its power.

Reviews of evidence have called for more research on the effectiveness of approaches to teaching, learning and student engagement in HE that can surpass local examples of practice (cf. Asikainen & Gijbels, 2017; Ertl et al., 2008; Vermunt & Donche, 2017). However, research also shows that even when we know 'what works', impacting consistent change in HE practice is difficult (Vermetten et al., 2002). For example, despite a growing body of research demonstrating the benefits of dialogic teaching and learning (Mercer et al., 2020), research on HE practice finds largely lecturer-fronted talk (Hardman, 2016). Even when reporting strong tutor desire to work dialogically, research points to complexities of change encountered by both staff (Heron, 2018; Shea, 2018) and students (Engin, 2017). This demonstrates a need to better understand implementation, and the barriers and mechanisms of change in HE practice (cf. Edwards, 2016; Hofmann, 2016; 2020).

This Chapter is motivated by the question of what kinds of methodological tools can help us understand not only if, but how and to what extent, change is happening, and how we could facilitate it. A focus on educational practice and change needs to be coupled with *methods* that enable systematic and rigorous analyses of practice. There is an observed gap in methods of research on teaching, learning and student experience in HE (cf. Tight, 2013). Experimental research engages with questions of 'what works' but does not alone tell us *how* practice changes. On the other hand, practice-based studies on educational interventions in higher education are often local, for example focused on authors' own educational practice. While highly interesting, they often do not use methods which could generate conceptual insights applicable beyond local settings (Tight, 2013; Guzmàn-Valenzuela, 2016; Ertl et al., 2008). These and other HE authors have called for more focus on methods that enable systematic and rigorous investigations of practice (Jarvis, 2018; da Silva Lopes et al., 2016) and engagement with methodological principles of data analysis that can support theory development in HE research. While questions of how meaning is generated from our engagements with data are always also ontological and epistemological, this Chapter approaches these questions primarily on a methodological basis.

Introducing the principle

Idea 1: Re-thinking the relationship between similarity and difference

In natural sciences, knowledge about the world is often described through law-like statements, which, though of varying type and certainty, describe systematic underlying regularities (see Dagher & Erduran, 2014, for discussion). While we often think of laws in the natural sciences as deductive and exact (true) mathematisations of an underlying reality, on a closer look a much more nuanced

picture emerges, with differences between the disciplines (cf. *ibid*.; Erduran, 2007). In physics, it is easier to define model systems that can be adequately *mathematically* captured, while historically, chemistry and biology examine much more complex systems; hence *classification* has played a central role in forming knowledge claims in those disciplines (particularly until the arrival of quantum chemistry and fields like biophysics). I want to highlight a central feature of classifications in the natural sciences. Unlike many categorisations in data analysis in HE research (often referred to as 'themes'), classifications in chemistry and biology – such as the Periodic Table or the theory of evolution - not only *describe* phenomena of interest, but *explain* and *predict* those.

My purpose here is not to discuss the nature of knowledge claims in different disciplines. I want to draw attention to how the Periodic Table (and indeed the 'Tree of Life' as a representation of evolution theory) organise their observations. In the Periodic Table, the rows describe the number of electron shells an atom has, while the columns contain elements with the same number of electrons in a particular subshell. In other words – and here is my simple point – each row, and indeed column, contains elements that are similar in one key feature, and each different with regard to another key feature. While, certainly before the dawn of quantum chemistry, these similarities and differences were approximate, they were nonetheless powerful: Erduran (2007, p. 254) points out that "a vast amount of chemical knowledge is gathered by studying patterns of variation that occurs within vertical columns or groups in the periodic table". I argue that the relevance to our discussion at-hand is the idea that insights do not arise solely from studying similarities (grouping things). Nor do they arise from solely studying differences (elements in different parts of the periodic table): they arise from *identifying things that are similar, and then identifying and examining differences within those*.

Similarly, in the theory of evolution, metaphorically represented as the tree of life, living organisms are understood and examined through identifying a similarity in a seemingly diverse group (e.g., animals with backbones), and then studying their differences. Therefore my next step is to introduce the principle of starting with a similarity in in order to gain a new angle of looking at our social scientific data. However, as with the Periodic Table, the insights gained from the theory of evolution depended on the *specific* similarities which were the analytical focus. This is the third key idea of my principle: to afford a new angle into our data, the similarities we choose for our analysis must be productive ones.

Idea 2: Gazing from similarity to difference changes our view

Experimental research in education studies differences in differences: the difference in outcomes after different treatments. I suggested that a fruitful way forward for qualitative analyses of practice is to analyse similarities and differences together in a particular way, through identifying and examining *differences-within-similarity*. Now, this may appear rather obvious. However, this is not what always happens in educational research. Let us consider the following example.

Example 1 (mathematics lesson on probability):	**Example 2 (mathematics lesson on probability):**
T: So how many things can happen? **S(1):** Three. **S(2):** Out of four? **T:** How many things can happen? **S(1):** Four **S(2):** No, three. **T:** *Four* [with emphasis]. Right. [Moves on]	**T:** What's the odds on me getting a six? **S1**: One in six. **S2**: Unlikely. **T:** One in six. I prefer numbers they're better than unlikely. (Source: Ruthven & Hofmann, 2013; Hofmann & Mercer, 2016)

Whenever I show this example to (very bright) junior researchers, they invariably tend to focus on the *difference* between these two extracts, regardless of the question I pose, typically observing that Teacher1 simply ignores an incorrect student answer, while Teacher2 acts differently, providing an explanation. However, *both* examples illustrate a typical feature of teacher-student interaction identified in the school and HE literature (cf. Webb et al., 2009; Hardman, 2016): incorrect student responses are immediately evaluated as such, while correct student responses are accepted at face value without probing. Studies/Interventions with significant professional learning support have failed to effect change in this pattern (cf. Hofmann & Mercer, 2016; Shea, 2018). What the extracts illustrate is that this feature is in fact not a single phenomenon: they show how differently it can play out in practice, with potentially different consequences for students' learning opportunities. Research on HE classrooms similarly demonstrates that apparent differences in interaction can belie strong(er) underlying similarities shaping student learning opportunities, as seen in the example from Hardman (2016).

Extract 2	Extract 4
T: ok, so what kind of sources of income have we got cash coming in? S: loan **T: loan, ok, loan, yep, good** S: salary **T: salary, ok.** **T: any more? anybody had a birthday this term so far? or a birthday coming up this term?** S: gifts **T: ok, so gifts** **T: ok, what else we got?**	**T: wha, what kind of awards?** S: erm, in some countries or some schools if you're from a particular region of the country, they give you a percentage of money like in my country [inaudible] your country and your school the government gives you some money to support your schooling **T: OK, erm that could be a scholarship or could be a bursary so we'll call that a bursary if that's OK**
SOURCE: Hardman (2016) [bold added, RH].	

Extract 2 contains one word student responses, while Extract 4 contains an extended student response. However, Hardman's analysis observes that these exchanges illustrate a *similarity* across her HE data set: Student responses are brief (2), or re-voiced by tutors as brief (4), ignoring the more elaborate content of the student's response ('we'll call that a bursary'). Therefore, even when student responses are more elaborate (4, a potential difference), the message given to students is that one word ('bursary') is all that was required from them. Research suggests understanding such nuance in teaching may be significant for identifying pathways to change in professional practice (Hofmann & Ruthven, 2018; Hardman, 2016). .

Idea 3: Not all similarities are equal

Let me take another example. In one of my data sets, school students talk about their perceived ability in mathematics. The data contains many statements like 'I'm good at maths' and 'I'm bad at maths', 'some people are just born that way'. This is a relevant example also from HE perspective: research shows that perceptions of one's ability and academic self-confidence are important, as well as variable, in HE, including being low despite external evidence of success (I will return to this).

Now, we could use this data to code it according to how different students talk about their own ability, or how they explain mathematical ability (e.g., as inborn). However, this would give us no information on how any *other students outside the study* might think (we certainly cannot statistically generalise from a small, non-random sample of students to any wider population).

Secondly, such analysis would give us no direct link to *practice*: whether, and how, practice might change to shape student perceptions. Thirdly, it would give us no tools for dealing with *contradictions present in the data* (notably the fact the same student will at some point define themselves as 'not very good at maths' and then as 'pretty good at maths'). Examining different types of talk within each category of ability perception would be a good start, but I suggest we can go further in re-conceptualising the analytical similarity we will use, before examining differences within it.

If we turn our question from '*How do students perceive their (own) ability in mathematics?*' to '*What evaluative practices do students encounter in school that give them messages about their mathematical ability*?', new opportunities for analytically constructing a similarity arise. We can start by identifying and selecting instances in the data in which students talk *both* about their ability in mathematics, *and* some classroom practice, regardless of whether the ability-statement contained is positive or negative. The presence of such talk now constitutes the new analytical similarity within which differences will be sought and compared. I note that this may mean excluding data in which students talk (only) about their mathematics ability. Within this sub-set, we can examine the differences: different classroom practices discussed in conjunction with ability statements. This moves us beyond simply describing what these specific students said about their ability: it enables us to start developing an *explanation* of why students might make certain discursive statements about their ability. In other words, it enables us to start *theorising*. Consider the following data extracts:

> In writing **I know I've done a good job because normally people give you nice compliments**. --- when people say you are really good at something you kind of feel like you *are* good at it --- **nobody ever really compliments me on my maths and I know that I'm not good at maths**.

> Some people write with the teacher and some people write with [an assistant], and normally **you aren't very good if you go with the teacher**, because she's meant for teaching more important stuff so **you can tell if you are not that good**.

Far from fixed internal assumptions of her ability, the student is saying that she *knows* if she, or others, are good at mathematics based on classroom practices (such as 'getting compliments' or 'working with the teacher') which offer evaluative messages about ability. This also explains why there might (as observed) be contradictions in the students' discursive statements about their own ability. Not only might different practices give contradictory messages (such as getting compliments and working with the teacher); the same practice may position students differently from before:

> Some kids go off to a different group, like a maths [challenge] group because they are better. ---I guess I'm pretty good at maths. In my old school I was in the highest group. [But having moved to a new school, she says:] I know that I'm not good at maths because I'm not in the special group.

The data remains the same, but changing the angle from which we look at it, a different set of similarities, and thus differences-within-similarity, arises to afford new insights. I will return to illustrating ways to achieve this. Two key ideas are worth highlighting here. Firstly, the approach to data analysis suggested is not to do away with contradictions in the data. Contradictions are understood here as part of our social and educational practice, and our analyses need to be able to identify and explain them. Secondly, as the above examples have illustrated, what is referred to as an analytical similarity here is not just a matter of identifying data around 'themes,' and then looking at what is in that data. It is about turning our gaze to a different angle, in order to identify *new similarities* not necessarily available to people through simply being part of those social practices (cf. Mercer, 2010), like a prism. Key here is to identify the nature of a (productive) similarity within a

social practice that can act as basis for *comparison*. It is these two issues I will discuss next: the nature of social and educational practice and change, and the role of comparison in critical analyses of that practice, before turning to demonstrating the approach with a range of educational research examples.

The theoretical roots

Why should identifying nuanced differences in seemingly the same things – or putting it the other way round, identifying the similarity in seemingly different things, be so important in our research on HE practice? While an in-depth theoretical discussion is beyond the scope and purpose of this Chapter, I will offer a brief background.

My research is informed by a broad sociocultural perspective to psychology, in particular cultural-historical activity theory (CHAT) (Engeström & Sannino, 2010; Edwards, 2016) and dialogic theory (Wegerif et al., 2020). The key ontological tenets of these strands of theorising emphasise human agency and the embeddedness of human subjects in social practice. The various strands of sociocultural theorising share an understanding of social practice as multi-layered and heterogeneous. They further highlight the dialogic nature of meaning making in and through research. This calls for a focus on *difference*. For dialogic theorising, a difference between perspectives is the source of human meaning. For CHAT's developmental perspective, differences forming contradictions drive change. I will address two key ideas from the theory which I argue are relevant here: the idea of dialogic space and the idea of contradiction.

Drawing on Bakhtin, Wegerif et al. (2020) argue that it is the holding together, and inter-animation, of different ideas or perspectives which leads to new insights. Such dialogue between two or more perspectives is essential to meaning making: "new meaning emerges out of the opening of a dialogic space in which there is uncertainty and a multiplicity of perspectives" (*ibid*., p.13).

CHAT theorises the role of such tensions. It highlights systemic contradictions in our dialogic and material social practice as a key driver for change in social practice (Engeström & Sannino, 2011). Even when system change is not possible, CHAT finds that examining contradictions or smaller tensions in educational practice can motivate change efforts from educators (Edwards, 2008; 2016; Engeström, Engeström & Suntio, 2001). While such local contradictions can be highly visible to practitioners, they can be latent and require research-based tools to help identify, articulate and examine them (Engeström et al., 2001; Mercer, 2010; Hofmann, 2017). This suggests that research findings can gain wider value beyond their context of production through becoming tools to examine local contradictions and facilitate such change in HE practice.

Both these ideas point to the need to analyse inter-linked differences in practice. Hence *comparison* is fundamental to our data analysis. I argue that the way we can analytically 'hold the differences together' in a dialogic space to generate new meanings is through grounding the differences within an identified similarity. However, I have emphasised that not any similarity will do. To further illustrate the power of comparison, and the centrality of the particular similarity chosen for analysis, I draw on work in sociology of education by Robertson and Dale (2017). While their methodological reflections on comparison in educational research relate to policy, I argue that these have wider relevance for data analysis in HE research. They write:

> "Comparison is, above all, about problematising, rather than taking for granted --- through comparing things that are familiar to us with things with the same name in other places, we learn that there are

> different understandings of the same things in different places, at different times, with different origins and meanings. More briefly, comparing produces *the possibility* of difference, and it might be hoped, a desire to understand and explain those differences." (Robertson & Dale, 2017, p.873)

What Robertson and Dale's work highlights for this Chapter's argument is their call to pay further analytical attention to the (assumed) *similarity* within which the differences are examined. The authors demonstrate how, while many educational studies comparing things purport to focus on differences-within-similarities, the *similarities* are often misinformed. They are, for example, things we call the 'same', rather than things that have been analytically established as being the same. It is this taken-for-grantedness of the similarity in these analyses that limits, even distorts, the insights from them. If, as Robertson and Dale argue is often the case, they are not actually the same thing, dialogically comparing them fails to produce the opportunity for conceptual insight. This calls for reflection on the conceptual tools we use to identify sameness. The rest of the Chapter outlines and illustrates different ways of identifying and employing productive similarities in data analysis on teaching, learning and student experience.

Outlining and illustrating the approach in practice

My core argument is that the construction of a productive analytical similarity within which differences are analysed is central for generating new conceptual insights about educational practice. In this section, I outline and characterise three different ways in which such a similarity can be constructed: based on participants' own categories, the literature/theory, and through a multi-staged approach which I will term *weaving*. Each of these can take shape in more than one way, which I will discuss.

Given participant category as similarity: A study of postgraduate leadership development

I start with a fairly simple example from my research on university-based clinical leadership development in postgraduate medical education (Hofmann & Vermunt, 2017). In leadership development, 'other people' are commonly considered as 'followers'; leadership development focuses on how postgraduate trainees can influence people, bring them on board. Because this was also how the participants, at least explicitly, talked about 'other people', we took this as our starting point for similarity. Through identifying and comparing different elements within this data, a more differentiated picture was formed about the roles of 'other people' in clinical leadership. For the participants, talk of other people was, at an apparent level, a manifestation of 'sameness'. We collated this data, then approached it through the questions: '*How, Who, Why, When, What and Whither,*' to tease out the nuanced differences among the talk of 'other people'. Through this analysis of differences within (what was assumed by the participants, and often the literature) a similarity, we were able to generate a novel and more multi-faceted picture of the role(s) of 'other people' in clinical leadership. This example is very similar to traditional thematic coding. However, in maintaining the link to participants' own categorisations of similarity and difference with regard to the roles of others, our finding maintained the opportunity to inform educational practice and challenge students' existing views, as well as generate academic insights about leadership development. Through acting as a tool, our finding could help actors identify *differences* among the roles of other people in their leadership efforts. Hereby it could also act as a tool to address the challenges of change through illustrating how those (such as barriers posed by other people) could be addressed in postgraduate education (for example through the 'What' question, to identify sources of support).

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Re-constructed participant category as similarity: A study in medical education

My second example is less linear. It comes from our study on postgraduate medical trainees learning to use focused echocardiography (FICE) to monitor patients' hearts (Hofmann, 2017). This multi-professional study included participants of seniors from different specialties, in addition to postgraduate trainees. This example also starts with something that is in the data (and often in the literature): participants' talk about 'risk' involved in implementing in practice a clinical intervention the trainees have learned about in their course.

We assumed our similarity would be talk about 'risk' and would contain different aspects of risk (much like my first difference-within-similarity example). While we anticipated that different stakeholders could have different risk perceptions, new insights were generated by re-defining the similarity of our comparison much more specifically. In the data, the participants from different groups constructed their talk of 'risk' as a different thing from other groups' perceptions of risk. Through working backwards, we were able to identify that there was actually a similarity in apparently disparate observations, but it lay elsewhere than expected. What emerged as a similarity was talk about 'perceiving as risky other stakeholders' assumptions about how much information the new diagnostic tool could offer'. Using this as the similarity, we found that, in fact, different stakeholder groups held this *same* perception about risk with regard to each other, without knowing it. Consultant clinicians felt they were clear on what FICE could offer but perceived postgraduate trainees' assumptions about what FICE could offer as inflated, and therefore as a risk:

> I've had one or two trainees that have maybe pushed the concept of FICE and what they're really meant to be looking at, a little bit further than they should have been.

While trainees, on the other hand, also felt *they* were clear on the limitations of FICE, but in turn perceived other professional groups', including consultants', assumptions about what FICE could offer as inflated, and therefore as a risk (and, therefore, were reluctant to admit in clinical situations that they had been trained in FICE):

> I'm very clear about what I feel that I can gain from it, but sometimes I feel like the expectation [from seniors] that we would give more information, than what we should.

There was a similarity in the data of perceiving others' over-inflated assumptions as a risk but a difference, a contradiction, regarding which group was perceived to have such inflated view. Uptake of the diagnostic tool after initial training was low; this uncommunicated discrepancy may have been one barrier to change, as it made both groups 'resistant' (consultant) or 'cautious' (trainee) about fully implementing the intervention.

Starting with a construct from the literature to establish a similarity: A study of risk perceptions in university-based entrepreneurship education

In our study of university-based entrepreneurship education (Fluhrer et al., 2019; forthcoming) , many participants, considering a choice between academic and entrepreneurial career pathways, expressed lack of tolerance for risk, describing low risk tolerance as an aspect of be(com)ing academic researchers. This resonates with the literature, where *increasing* risk tolerance is seen as central to entrepreneurship education in universities (Kyrö & Tapani, 2007; Todorovic, 2007), thereby at least implicitly assuming it one-dimensional. We therefore started our analysis with the notion of 'risk tolerance' (similarity). Indeed some participants described increases in their risk tolerance after participating in the multi-university entrepreneurship course. However, two

challenges emerged. This analysis did not allow us to develop a conceptual explanation of why risk tolerance might have increased. Secondly, analysis of perceived increases in 'risk tolerance' could not help explain the incongruence we identified (resonating with Sauermann & Roach, 2016): that participants did *not* characterise postdoctoral academic career pathways as risky (despite their well-known precarious nature). We hypothesised that participants might be referring to something *different* (rather than something *more*) when discussing the risk of entrepreneurship, compared to the risk of academic work. We needed a new analytical similarity to 'hold together' these differences in an analytically productive way.

Changing our similarity from 'risk tolerance' to 'risk inevitability' provided a new pathway into developing explanations both about learning about risk, and the identified incongruence. Comparing data on perceived risk inevitability, we identified a new difference. Risk in relation to entrepreneurship was characterised as *inherent*, while risk in relation to academic (research) work was described as *contingent*. Characterising risk as avoidable in academia may help explain participants' concern regarding the risk of entrepreneurship, but does not fully explain the incongruence involved. We therefore looked for a *repeat* difference (see below) within the same data collated around the similarity of risk inevitability. We found that while participants appeared to think they were talking about the same kind of risk with regard to both activities, actually when participants talked about risk in relation to academic research, they were talking about its *outcomes*, the research findings, whereas when talking about entrepreneurship, they were talking about risk in relation to *process*. Risk-taking in relation to the quality of research outcomes was seen as unacceptable and avoidable: 'you work on it until you are 100% sure', making risk something negative: 'when you are a scientist, you just don't take a risk'.

During the course many came to perceive the inherent risk of entrepreneurship as related to its process, without this necessitating a failure of its outcome: even if the process fails – and this is acknowledged as a real risk, 'part of the journey' – it is not 'the final outcome', they can 'learn' from it, it 'prepares you for the next steps'. The participants have already, at least implicitly, accepted this kind of risk with regard to postdoctoral academic careers (the career process is indeed risky even when the research outcomes they produce are good, cf. Sauermann & Roach, 2016). It appears it was the shift in perception of risk on entrepreneurship as relating to process, not ultimate outcomes, that made that risk more palatable, rather than simply an increase in risk tolerance.

Operationalising a theoretical construct to establish a similarity: A study of students' personal agency in doctoral studies

I draw here on Hakkarainen et al.'s (2014) interesting study on doctoral students' experiences which employs the theoretical construct of 'agency' to make sense of student experience data. A central feature of the theoretical notion employed is that 'agency' not only relates to the individual student's experiences, but their participation in and contributions to, the learning practices they are part of (see *ibid*., and Hofmann, 2008a, for further theoretical discussion of the theoretical construct of learner 'agency'). Such a notion guides the analytic similarity chosen that involves, operationally, both the participants' experiences and self-perceptions regarding their academic competence, and features of the learning practice. An interesting insight emerges with regard to postgraduate students' 'personal agency' from considering, as the similarity, 'students' talk about their academic competence when such talk also involves reference to external sources of information on their competence' (whether successes or challenges) (my re-framing of the analysis by Hakkarainen at el., 2014). The study shows that external evaluative information that suggests the students are highly capable and successful (e.g., having been selected to undertake funded doctorates in prestigious

institutions, or publishing something first) does not automatically lead to a sense of personal agency as a doctoral student. Instead, when the external information considered requires dealing with challenges or failures, talk about personal agency is often positive. The study shows that rather than from mere successes, the development of sense of personal agency in doctoral students arises from coping with challenges and recovering from failures.

Based on my earlier research (Hofmann, 2008a), I suggest that being selected, over other candidates, into doctoral study, or publishing something before others, are *vertical* differences in learning (getting ahead of someone else). Developing one's personal agency as a student through dealing with challenges/failures, on the other hand, could be regarded as *horizontal* differences, in that they do not involve a hierarchical comparison with other students. This study's findings, then, suggest that students' sense of personal agency is simultaneously both vertically and horizontally contingent. This finding resonates with other research on students' sense of agency (Hofmann, 2008a; 2008b) and could help explain why apparently highly successful HE students may struggle with their academic self-perceptions and how we might support them. It may further help suggest ways of enabling all students develop a sense of agency, not only those on the 'top'.

The next two examples examine observational data. Due to limited observational research in HE (Tight, 2013), the examples come from school context. However, HE research suggests that the issues – implementation of dialogue in teaching and learning and changing professional practice – are highly relevant in HE settings (Hardman, 2016; Vermetten et al., 2002).

Operationalising a construct from the literature as the similarity: A study on dialogue and accountability in classroom teaching

Our study of teachers implementing a dialogic teaching intervention in English classrooms (Maine & Hofmann, 2016) had started by identifying features of teacher-student interaction which the literature suggested support learning. An intervention to support productive classroom discussion involved operationalising findings from the literature into discursive markers which could be shared with the teachers. Subsequently identifying these discursive markers in the classroom observations offered clear evidence of implementation of the intervention. Based on these markers, we then identified a sub-set of teachers who were implementing the intervention in an apparently similar way. Examining the differences between these discursively similar instances of teacher-student talk, we found that different underlying operating principles appeared to guide what teachers were doing with the talk: Using the same talk-markers, it was possible for teachers to either steer students authoritatively towards a 'correct answer', focus them on explicit use of comprehension strategies (but without signalling the quality of different possible responses) or guide students to examine each other's perspectives. These findings could help explain Shea's (2018) finding of the difficulty for HE educators to coordinate student engagement in dialogue without over-emphasising authoritative responses.

The final two examples illustrate what I will call *weaving*: a multi-staged process in which the same data set is alternatingly looked at from different directions. I will identify and characterise three ways of doing this: matrix, repeat and chain.

Creating a difference-within-similarity matrix: A study on interactive norms in classroom practice

Research on interactive features which promote learning in school (Mercer et al., 2020) and in HE (Engin, 2017) suggests that explicit and shared ground rules for talk are beneficial. This observation example (Hofmann & Ruthven, 2018) comes from our large-scale observational research in secondary classrooms implementing a dialogic teaching intervention (which encouraged the teachers to develop such ground rules with their students). The study found a consistent set of normative injunctions for classroom interactions across the classrooms. These involved the requirement to listen to others, contribute to classroom discussion, treat others with respect, elaborate one's answers, and try to reach consensus. In line with our theoretical understandings of norms as consisting of surface level expressions and underlying rationales, we also identified a number of rationales for those norms. So far so good. We could have finished here. This would have entailed a separation of similarity and difference: data about the same norm were grouped together as one 'category', data about another norm elsewhere as another 'category', creating, effectively, a description/list of the kinds of norms for teaching and learning that existed. However, this would have had no capacity to inform us about other settings, or how those norms might change.

A disciplined approach of staying with a similarity, then seeking to identify differences within each similarity, revealed an entirely new understanding of the structure of these norms for classroom interaction (and possibly educational norms more widely). Examining the rationale talk for one norm at a time, we found that a number of very different rationales were expressed for each norm. However, this was still only an empirical finding. We then used this finding to ask new questions from our data, creating a chained approach whereby the previous difference becomes the new similarity: we asked how the different rationales expressed about each norm relate to one another. This meant looking for similarities in the rationale talk across the set of surface norms, then examining how those similarities in the rationales related to the different surface norms those supported. Through this analysis we found classroom norms to be, in fact, multi-dimensional: *each* of the surface norms could be enunciated in terms of multiple underlying rationales. More specifically we found four, described as operational, interpersonal, discussional and ideational. Apart from contributing to the structure of norms for social interaction, our findings shed new light on why the dialogic intentions of such interventions are often realised in a superficial way, since superficial and deeper changes in practice can look the same on discursive surface level.

These examples resonate strongly with, and could shed new light to, observations of the difficulty of transforming HE classroom pedagogy to involve more dialogue even when appropriate ground rules exist (cf. Shea, 2018). Moreover, this approach to analysing the data as difference-within-similarity illustrates how a (large-scale) research approach focusing on normative or discursive features of talk in teaching and learning settings may miss the learning opportunities actually realised for students in those settings. In interventions contexts this also means that such research approaches may over-estimate the extent to which change has taken place (and therefore, if learning outcomes have not changed, falsely assume the original intervention to be ineffective).

Weaving difference-within-similarity constructions through the data: A study on student ownership in learning

My final example illustrates a further multi-stage chained approach. It comes from ethnographic research on school students' sense of agency and ownership in classroom learning (Hofmann, 2008a; 2008b), again a significant topic in HE (Mann, 2001). A common suggestion in school and HE is that students 'want' autonomy and choice in their learning, drawing on analyses of what students (say they) 'like' compared to what they 'don't like'. In the example study, students talk about writing tasks involving imagination, one classic example of choice in classroom learning. The writing tasks

are imaginary journal entries for characters travelling through Roman Britain. When asked on a general level, students state they 'like having choice' in learning tasks. However, when talking about specific tasks, a difference emerges:

> ALISON: **I *loved*** the [imaginary historical] journals because you could write from your point of view and it could be *anything* you want. --- **you could write your own story** and **what you thought about it**. --- [Sometimes the teacher] told us like okay we're gonna write about, the [Roman] town --- and then she said 'I want you to write down some facts' and she'd have it on a piece of paper ---. And that was something I didn't like about it.
>
> CHARLOTTE: When you can write what you want, **you can like go right off track**, you can go to imaginary and stuff like that but it's also fun when you *have* something. [When] you write something and you think that's wrong, so [it is good that] you have ideas like what you're supposed to do and not supposed to do.

In these extracts Alison and Charlotte both compare situations where they could write 'anything you want' with situations where 'teacher gives you ideas what you are supposed to do'. Alison 'loves' the opportunity to write 'anything you want', as an opportunity to 'write your own story and what you thought'. Whereas for Charlotte, being asked to write 'anything you want' is 'fun when you *have* something', but relates to a possibility to 'go right off track' and write something 'that's wrong'. While Alison does not like the teacher saying what they are supposed to include, constructing it as a limitation, Charlotte expresses a positive view of this, constructing it as a resource. Far from claiming that 'students' (as a somehow unified group) 'like choice', this begins to depict a much more varied view of how students might experience choice in formal learning settings.

How can we use this finding to generate a new question (answered by the same strategy), to further understand the nature of this difference? We can find another example, a *repeat*, of something, such as the same pairing of students talking about imaginary writing activities and examine differences among those to enrich our understanding (as with entrepreneurship above).

> ALISON: [Having a choice] makes me think --- this is my story, --- it just feels better to have your own story. That you've made up everything in this story. --- I like to have it [open] --- then you can write whatever you want. Because then I can actually express my feelings the way I know I would imagine it. Not the teacher would imagine it.
>
> CHARLOTTE: Working on your own [in tasks involving choice/imaginary] you feel like you don't have that much ideas because you're a person that doesn't know that much, or not that you don't know that much but like, but that you don't know that much ideas.

For Alison choice/imaginary is an opportunity to write 'her own story' using only 'her ideas'. For Charlotte, however, it is a threat, a risk: she describes herself as "you're a person that doesn't know that much ideas." And as she says, without 'ideas' you can't write – or 'own' – a story.

The interest here is not simply in differences between individuals, but how those differences relate to educational *practice*. We can take this comparison further and choose another connected similarity to focus on: rather than different students talking about the same activity, we take the student (Charlotte) talking about the task (journal) as the similarity, and look what differences exist within that sub-sample of data. Another new insight emerges hereby. Below Charlotte is talking about another journal entry within the Roman Britain topic which involved imagining a ship journey.

> CHARLOTTE: [I wrote about] how I would feel when I was going on a boat --- and I [wrote that] I

> brought a fishing rod so I could catch some fish because we usually go fishing --- on my grandfather's boat ---
> RH: Did you like being able to use those things that you knew from your fishing trips?
> CHARLOTTE: *Yeah*! (Enthusiastically) Cos you get more ideas.

When she has access to ideas, Charlotte too, expresses enjoyment for an imagination writing task. We can now *chain* this even further: choosing the boat writing task as the similarity, and explore differences in students' talk about it. Below another student talks about the same (boat) writing task, and we see a further difference:

> NICOLE: Um.. well I thought it was sort of hard to think about it, because I really don't really know what it's like going on a boat, cos I've never been on one.

This suggests that doing imaginary writing tasks is enjoyable when students have access to 'ideas,' either from one's own experience, one's imagination, another student, or task resources, as opposed to it being simply about choice. These specific experiences may be unique to each student, but the differences-within-similarity identified here are likely to have wider significance in educational practice. Moreover, this links student experiences to *practice*: while educators cannot directly influence students' own imaginary capability or their out-of-school experiences (just like they cannot decide if doctoral students' papers are accepted), the set of the work and resources provided to students (like the support offered to HE students learn to deal with challenges) are aspects of practice that can be made available to all students.

It is important to emphasise that these are not the results. As with any approach, we need to analyse our entire data set. Doing so may involve a range of methods of coding and analysis. What this intermediate method offers is an angle to our data analysis that can give access to new insights, help us ask good analytical questions, develop and test working hypotheses in the data, rather than simply identifying and summarising 'themes' – and ultimately helps link our findings to wider educational practices.

This Chapter demonstrates a way of mobilising data to produce richer insights into educational practice, and the differences within it that may provide opportunities for change. It has done so through outlining a method of looking at data from different directions in a multi-dimensional space, to go beyond listing/describing the phenomena within it, to understand their variation and structure. In understanding the range and structure of teaching, learning, student experience, we have a greater chance of producing insights that have wider applicability across settings. For example, in understanding the range of ways in which students in one learning setting may experience the 'same' learning opportunities, may help us understand possible student experiences in other learning settings. The discussion has also shown how understanding how students' learning experiences are related to aspects of the learning practice, and not just individual student characteristics, gives us a tool for analysing other learning situations and settings.

Finally, I will turn to reflecting on how the difference-within-similarity approach contributes to our understanding of HE practice, before synthesising the different tools identified.

6. Discussion

There is an identified need in HE research for methods with the capacity to generate insights about processes and mechanisms of pedagogic change, which are applicable beyond the specificity of the

local settings whence they originate. Moreover, there is a need for methods which inform and facilitate research-based change. This Chapter focused on developing an intermediate approach to qualitative data analysis which can support theoretical knowledge advancement. Developing theory depends not only on data analysis, but on the quality and coherence of the research questions and supporting literature, theoretical framework, methodology and sampling. However, there is something of a gap between methodologies and 'coding' when it comes to qualitative analyses in HE. This Chapter addressed the question: How can we engage with our qualitative data in a way that could generate insights into how change might become possible in and across educational settings?

I argued that to do this, we need to simulate reality in our data. This is not suggesting a notion of a stable independent reality. Social and educational practice is understood here as culturally and socially formed, shaped by shared norms, and including both shared cultural artefacts and the people who are part of the practice. As those people are simultaneously part of, and shaping, that practice, it also involves multiple perspectives. To simulate such dialogic social reality in our data, I argued we need to *conduct dialogues with our data* – identify and examine multiple possibilities of a 'same' phenomenon, whereby the possibility of difference produces the possibility of understanding. While sociologists are interested in the difference itself, as a sociocultural psychologist, my interest is to understand and facilitate change in educational and professional practice.

To do this, I propose thinking of this as *simulating the possibility of change* in our data. Cultural-historical activity theory argues that participants' examination of contradictions in their social/educational practice creates the possibility of change, hence guiding our analytical gaze to discursive manifestations of contradictions in people's talk (Engeström & Sannino, 2011). However, as seen above, contradictions are not always visible to participants in a practice. Therefore it falls on our research to identify the manifestations of different demands in educational practices which could create such opportunities. Comparisons of the type I have delineated create possibilities of seeing new differences in our data by being able to 'stop' and look at the practice (data) from different angles. Such analyses can identify latent scope for horizontal movement within seemingly singular phenomena or practices. Such horizontal moves, Edwards (2008) has argued, may reveal for educational participants that there may be alternatives to current practices even where these appear unchangeable.

To do this, the analytical identification of the similarity becomes crucial. In this Chapter, I have identified 3 distinct ways of establishing similarities which could benefit a range of analyses in HE and beyond.

Firstly, analytical similarities can be identified/established based on **prior literature and/or theory**. If using prior literature/theory, *operationalisations* for identifying the similarity in the data may already exist and be readily drawn upon (such as in my example of teacher responses to incorrect student answers). Or the operationalisations for prior research findings may need to be developed, to analytically identify similarities in our data for further comparison(such as in the example of student 'agency'), or further refined (such as in the example of entrepreneurship education).

Secondly, the similarity can be constructed **empirically**, from our engagement with and questioning of the data. At its simplest level, this was seen in the example of taking the *participant category* of 'other people' in clinical leadership as a similarity. The example from medical education illustrated how the empirical construction of a similarity may require '*backwards processing*', when what is initially assumed as a similarity turns out, empirically, not to be one.

Thirdly, my examples of entrepreneurship education, students' experiences of choice, and of dialogic classroom norms, illustrated a multi-staged approach to using the difference-within-similarity approach in our analysis. I have called this **weaving** because it generates insights through combining successive forward and sideways moves within the data. Three weaving processes were illustrated. In the analysis of interviews on choice, and entrepreneurial learning at university, *repeats* involved selecting a different difference within the same similarity. *Chaining* led us to take an aspect of a previously identified difference as a new similarity and follow on to identify a new difference, as with Charlotte and the boat task, or (in another loop in the chain) Charlotte and Nicole. The analysis of classroom norms, also woven, could be described as a *matrix*, where different surface expressions of norms formed one dimension of the comparison, and the different types of rationales expressed for those norms the other.

In their seminal work on theory generation in ethnographic research, Hammersley and Atkinson (2007, p.159) argued that theorising in data analysis is "an iterative process in which ideas are used to make sense of data, and data are used to change our ideas". The difference-within-similarity approach outlined is one potentially powerful way of doing this: it builds in the possibility that we use *ideas* (the established similarity) to make sense of our data. Through systematically seeking differences and contradictions *within* those ideas, our analysis has the possibility of changing our ideas, of theorising. What we may discover are not any old differences. I argue they have the capacity to represent what Carlile (2004) has called 'differences now of consequence' which actors involved in those practice can use to shape those practices.

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