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Individual Networks of Practice for PhD Research Socialisation

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Individual Networks of Practice for PhD Research Socialisation

Abstract

A PhD combines experiential learning of the research process with socialisation into the research community. Studying a PhD is a highly individual experience with each student seeking and receiving different types of support from different agents. In this paper we investigate the experiences of four PhD students at a Humanities faculty at a Thai university through a series of interviews. To account for the unique nature of each student's experience, we use Individual Networks of Practice (INoPs) as the main method of analysis. The interviews were first analysed by adapting Sala-Bubaré and Castelló's (2016) model of socialisation, identifying the social agents and the content of the experience shared with each agent, and then constructing an INoP (Zappa-Hollman and Duff 2015) map to visually represent each student's social network. These INoPs served to guide a qualitative analysis of the salient issues in the interviews. The INoPs highlight the unique nature of each student's set of agents and experiences, but there are also commonalities across students showing that peers and faculty staff serve as key social agents.

Keywords

Individual Networks of Practice, research socialisation, PhD, social agents, content of the experience

Introduction

The goal of a doctor of philosophy degree (PhD) is to create a scholar who can independently produce original research (Gardner 2008). This is achieved in two ways. Most obviously, a PhD involves experiential learning of the research process through conducting a piece of research that results in a thesis. In addition, at the same time the student is socialised into the research community and learns to adopt the values, norms and attitudes of this community (Gardner 2010).

For most PhD students, undertaking a PhD is very different from their previous education, where they were part of a communal group, all doing the same tasks. A PhD is a highly individual, and even lonely, experience (Janta, Lugosi & Brown 2014). Different students studying in the same programme each have their own experiences, with each needing, seeking and receiving different types of support from different agents. In this way, each individual PhD candidate creates a unique network through which they negotiate the demands of the programme.

This paper investigates the experiences of four students studying in the same PhD programme, looking at how they learnt to conduct their research and were socialised into the research community. Our focus is on the different agents with whom each student interacted to achieve their PhD goals. Since we view PhDs as highly individual, the students' experiences are interpreted through the lens of Individual Networks of Practice (INoPs), which aim to make explicit the social connections that individuals report using as support (Zappa-Hollman & Duff 2014).

Research socialisation on a PhD

Traditionally, and still in many cases, the PhD has focused purely on research. The student's main task is to produce a high-quality original piece of research that meets the requirements of the relevant academic research community. Doing this requires acquiring knowledge in the academic domain, learning how to conduct and write up research and becoming socialised into norms and values of the research community. These requirements are summarised in Sala-Bubaré and Castelló's (2016) model of the PhD experience, which distinguishes between the content of the experience and the social agents involved in the experience. The model includes six categories of content (Research Motive, Research Organisation, Research Procedures, Research Writing and Communication, Roles and Responsibilities, Personal Life). We will use these categories, which are discussed in greater detail in the methodology section, as the basis for a content analysis of our data. To these categories, we will add Weidman, Twale and Stein's (2001) concept of Knowledge Acquisition.

While the goal of PhDs is to produce independent researchers, and students are generally expected to be self-reliant, most students need extensive support to reach these goals. In theoretical frameworks of research socialisation, the main sources of such support have shifted over time (Bircher 2012).

In the 1960s, the most common focus of research into PhD research socialisation was the PhD supervisor as the main source of support (e.g. Rosen & Bates 1967). While conceptions of potential sources of support have expanded, the supervisor is still often seen as the most important single source of support for PhD students (Lovitts 2008). In the 1970s, the theoretical frameworks concerning research socialisation support expanded beyond the supervisor to look at all

interactions in the university. Thus, peers and other faculty were often included as social agents influencing students' socialisation (e.g. Bragg 1976). The importance of peers as a source of support has continued to be emphasised; for example, Gardner (2010) argues that they provide more support than supervisors. Faculty influence can be viewed as involving either personal contact between PhD students and faculty staff (e.g. informal discussions with faculty members) or socialisation processes often organised by the faculty administration (e.g. PhD enrichment activities such as seminars) (Rourke & Kanuka 2012; Weidman & Stein 2003). More recently, models have gone beyond the university to view any interactions that the student experiences as potentially helpful for research socialisation (Weidman, Twale & Stein 2001). In these more recent models, relevant social agents now potentially include personal friends and family as well as academic agents (e.g. Austin 2002).

This constant expansion of conceptions of who provides support to PhD students for research socialisation underpins Sala-Bubaré and Castelló's (2016) five categories of relevant social agents (the individual; the supervisor; the research group, comprising other faculty and peers; outside researchers; and the broader community). As with types of content, we will use these categories (discussed in detail below) as a key basis in our analysis.

Our view of the PhD experience as research socialisation, then, involves examining two issues in depth: the content of the experience and the social agents involved. Given the individual nature of the PhD experience, the types of content focused on, the social agents providing support and the relationships between these are likely to vary from student to student.

Individual Networks of Practice

Research socialisation involves becoming a member of the research community; this view fits with the theory of community of practice (Lave & Wenger 1991). A PhD achieves this goal through experiential learning, which may involve substantial scaffolding and support. For most PhD students, this experience differs from previous experience in that the scaffolding and support are not shared. As one of the participants in this study puts it, "at the Masters level, right, we used to have more like a community where we give supports to one another", but on the PhD "it's more of, um, just networks, just with your own friends and, you know, and that's it" (Dave, Interview 2).

Research socialisation on a PhD, therefore, is an individual experience based on networks (Baker & Pifer 2011). For this reason, the work of Zappa-Hollman and Duff (2015) on Individual Networks of Practice (INoPs) is relevant. An INoP focuses on the individual nature of each students' socialisation experience by analysing the unique network of relationships and social connections to create a map of an individual's social ties.

At the centre of the INoP is the core that represents the individual. Around the core are nodes, which are the key agents with whom the individual interacts. In Zappa-Hollman and Duff's network maps, these nodes represent specific individuals. The relationships between the core and the nodes are represented through ties, which illustrate the proximity and strength of the relationships. In their work, ties show the connection between the agents but not the nature of the relationship. Distinguishing between different types of connection is crucial to understanding research socialisation, as different people are involved with different aspects of the socialisation experience. For example, a PhD supervisor might be expected to give support in the research process, but family to be involved more in giving emotional support.

We therefore believe that INoPs would be even more productive if the ties indicated the aspect of the socialisation experience in which the person is involved. In our adaptation of INoPs, we distinguish between the types of content of the PhD experience primarily based on the framework in Sala-Bubaré and Castelló (2016), and therefore use different ties to represent different types of content.

Given the large number of potential content-specific ties, we use nodes to represent agent types rather than individuals, following the categories of social agents in Sala-Bubaré and Castelló (2016). In this way, we hope the INoPs will highlight how the various agents in each student's network differently contribute to the research socialisation process through giving support for different aspects of the PhD experience.

We aim, therefore, to construct INoPs for each of the participants in the study to provide insights from an innovative perspective on how PhD students are socialised into the research community, and to highlight the similarities and differences between individuals.

Methodology

The context

To see how INoPs provide insights into the research socialisation experiences of PhD students ideally requires a PhD programme where each student's experience is highly individual. PhDs in the arts and humanities are likely to involve more autonomous work (Austin 2002); we thus chose a PhD in Applied Linguistics where a wide range of topics are researched and where there is no clear preference for a particular research paradigm. The programme we focused on is at a highly respected university in Thailand, and consists of 12 credits of taught courses followed by a 36-credit thesis. As a requirement for graduation, students need to have three publications, one of which should be in a major international refereed journal.

The participants

To allow some comparison between each individual student's experience while keeping the quantity of data manageable, we decided to investigate the networks of four of the students on the PhD programme. In choosing the four participants, we tried to ensure a representative mix of nationality, gender, research area, length of time working on the thesis research and thesis supervisor. Details of each participant are given in the Results section. Standard ethical procedures were followed, with informed consent obtained. Pseudonyms are used throughout, including for social agents referred to by the participants.

Data collection

To create INoPs for each participant, we needed detailed information on the content and agents relevant to their research socialisation. Semi-structured interviews were selected to collect such information. Because semi-structured interviews are open and adaptable to the interviewee's priorities and allow in-depth personal contact, the story behind the participants' experiences could be extracted from their unique perspectives.

Each participant was interviewed three times. The interviewer was known to the students, but was not part of the PhD programme, and was therefore separate from the students' networks. For each of the interviews, a protocol was established to guide the interview while still allowing the

interviewer flexibility in responding to the interviewees' contributions. The interviews were transcribed, and the transcriptions were used as the basis for preparing subsequent interviews.

The first interview centred around the participants' experiences of research prior to their PhD, and included their journey through their masters and their preparation for the PhD programme. At the end of the first interview, the participants were asked to consider the networks and influences that had been part of their PhD experience before the second interview.

In the second interview, the participants were asked about their PhD research experience. To explore each participant's network, the interview protocol focused on the content categories based on Sala-Bubaré and Castelló (2016) and the associated agents. Specific areas of interest highlighted in the first interview were also identified as a focus for each participant.

The transcripts of the first two interviews were analysed, and tentative INoPs were drawn up for each participant. Using these, areas of particular interest were identified for follow-up in the third interview. Therefore, the topics covered in this final interview depended on each participant's specific stage in their PhD journey, and the topics arising from interviews 1 and 2.

Each interview lasted around 45 minutes. The interviews followed an active listening approach (Louw, Watson Todd & Jimarkon 2011), in which the interviewer made an effort to draw extended responses from the interviewees. The length (by word count) of the interviews for each subject was roughly the same (15,500-19,000 for the three interviews), with an average percentage of talk by the interviewees of 71.5%. The interviewer tried to remain sensitive to the co-constructed nature of the interview process through what Mann (2011) refers to as the parameters of sensitivity. For example, in the following extract from Interview 3, the interviewer's (I) contributions helped Gary (G) to consider his beliefs about the role of researchers; this is an instance where the interviewer both directed the interview according to the agenda and was responsive to the interviewee's contributions.

- | | | |
|----|---|---|
| 31 | I | Okay. Another one is being able to critique or being critiqued as a writer or as a researcher. |
| 32 | G | Ah, yes, yeah, you're right. I feel like from the beginning, right, when I look at the word "criticism", I always felt like it is very negative, but once I embarked on my journey I just learned to discover that criticism can be positive. After studying here for four years I feel like I am becoming more critical than before. |
| 33 | I | In a good way? |
| 34 | G | In a good way, yeah. Absolutely. In a very good way. I can always think about one issue in many other different ways. |
| 35 | I | Different points of view. |
| 36 | G | Yeah, yeah. |

This extract shows how the interviewer used an opening in turn 31 to prompt an initial response to the topic, and then clarifying (turn 33) and paraphrasing (turn 35) to co-construct Gary's understanding of the meaning of critique. Using an active listening approach in this way ensured extended responses during the interviews, but also helped balance the agenda demands with a need for sensitivity to the interviewees' personal disclosures.

Data analysis

After the interviews were transcribed, the interview data was analysed in two main ways. First, the frequency of mention of issues of content and social agents was addressed through coding the data. These codes were then used as the main input to produce the network maps showing each participant's INoP. Second, salient issues related to research socialisation were derived in two ways: from the dominant patterns in the network maps, and from a qualitative interpretation of the issues highlighted by the participants as being important in the interviews. Using this mixed-method data analysis (Watson Todd 2012) allows two complementary perspectives on the data, providing a richer overall picture.

Coding the interviews

As described above, the interview data was coded in two ways: by type of experience and by type of social agent. In most cases, turns or coherent sequences of related turns were categorised into a single pair of codes. In a few cases, participants clearly talked about two issues in a single turn, in which case two pairs of codes were used.

The codes concerning the content of the experience were based on the work of Sala-Bubaré and Castelló (2016), who identified six categories of content (the first six codes in Table 1). These six categories generally fit with other models of the PhD experience. However, given that research socialisation involves adopting the values and attitudes of the research community and that the six categories do not explicitly cover this issue, we expanded the first category of Research Motive to include beliefs about the nature of research, basing our interpretation of this on Murphy, Bain and Conrad (2007). Furthermore, one aspect emphasised in Weidman, Twale and Stein's (2001) influential model is not covered, so a seventh category, Knowledge Acquisition, was added. The final seven categories of the content of the experience are explained and illustrated in Table 1.

Table 1. Categories of the content of the PhD experience

<i>Category</i>	<i>Code in maps</i>	<i>Explanation</i>	<i>Illustrative quotation</i>
Research Motive	Motive	Beliefs about research and motivations for conducting research and studying a PhD	"...from the beginning all I know just that [it's a] three-year programme, and the – wow, the tuition fee is cheap, and just a three-year programme, so it's a perfect programme for me. But after I study here, I just learned to discover, wow, it's not so easy at all." (Gary, Interview 2)
Research Organisation	Organisation	Planning and managing study (e.g. registering, securing finance, organising time)	"I asked supervisees of my, our sisters of our mother, like Pee [honorific for elder sibling] Ben, right, Pee Fon, Ian, so we are under Ajarn [honorific for teacher] JumJim, and then so we talk about the style [of] our advisor, she likes this that those and you should, what you should do before you go to see her." (Som, Interview 2)
Research Procedures	Procedures	Conducting the research, including selecting a framework and data collection and analysis	"My supervisors [help me with analysing the data], but I think most of the job I have to do by myself, because when I talk to my supervisor I think it is more like, if I have some issue I can go back to that, but I don't think they are going to analyse my data right because it's my job. I'd like, you know, to have them to analyse my data, but, you know, I don't think so people really willing to do this kind of job." (Gary, Interview 2)
Research Writing and Communication	Writing	Writing the thesis and research articles, and presenting at conferences	"Like Pee Ben, when she want to because she's on writing, writing her international paper, and then we talk about how can – in what way or how to you start writing, do you always use this kind of phrase. Something like that, exchanging ideas." (Som, Interview 2)
Roles and Responsibilities	Roles	Development as a researcher, including sharing research and providing support about research to others	"I don't sense any differences, you know, hierarchy between like 'you are a student, I am a lecturer', but probably now reference, like they refer to themselves like 'pee' [elder sibling], not the word 'kru' [teacher] or 'ajarn' – yeah, make us feel like, yeah, you know, equal." (Som, Interview 3)
Personal Life	Life	Non-academic issues including socialising, getting emotional support and dealing with living in a new culture	"... she's good at making everything worthwhile, and you know that your ideas are cherished so it's very important emotionally. When you get healthy emotion you can work well." (Fon, Interview 3)
Knowledge Acquisition	Knowledge	Gaining new academic knowledge, including knowledge about applied linguistics and research	"I never leave his office the same way as I walked into his office, you know, there's always an addition. Even when we talk about some concepts which I think I already know, you know, but just talking to him alone changes everything, you learn something, I learn something from him at every given point in time." (Dave, Interview 2)

To categorise the people interacting with the participants, we started with the five categories of social agents detailed by Sala-Bubaré and Castelló (2016). However, when we applied these categories to the data, we found that they did not distinguish between some key groups of agents and did not cover some agents at all. We therefore made three changes to the categories. The original category of research group was subdivided into two categories: teachers and faculty-organised activities, and peers (other PhD students). The two categories of (inter)national researchers and broader community were collapsed into a single category of external academics. An extra category of non-academics, such as secretarial staff, friends and family, was added. Our final categorisation of social agents therefore used the six categories in Table 2.

Table 2. Categories of social agents

<i>Code in maps</i>	<i>Explanation</i>
Self	Where the participant explicitly states that he or she is self-reliant
Supervisor	The participant's formally assigned PhD supervisor; one of the participants (Gary) had two supervisors
Research group	Faculty staff (teachers and researchers) who are not the participant's supervisor(s)
Peers	Other PhD students studying in the same programme
External academics	Academics working at other institutions
Non-academics	Family members, personal friends outside of the PhD, secretarial staff in the university

After establishing the coding system, we each coded the interviews independently. After the two sets of codes were compared, Cohen's Kappa coefficient for interrater reliability was calculated as 0.81 for content, and 0.88 for the social agents, indicating high agreement. Differences arose largely from whether to code certain turns in the first place, rather than what code was appropriate for a particular turn. These differences were discussed, and upon agreement we prepared a final coding of the interviews. Although it may seem excessive to calculate reliability coefficients when there are only four subjects, the frequencies of the codes are key features in the INoP maps, and are therefore central to the data presentation. It is therefore important that the codings are reliable.

Constructing INoPs

The purpose of an INoP in this study is to show the connections between participants and the social agents they are interacting with while also addressing the type of support that concerns each connection. To create an INoP, we therefore start with the participant as the core node. Around this core, we place other nodes, each representing a type of agent with whom the participant interacts. The size of these nodes represents the amount of interaction, which is also quantified as a number attached to the outer node. Ties are then added between the central node and the outer nodes, with different styles of ties representing different types of content of the PhD experience. The frequency with which the agent type is associated with each content type is represented in the thickness of the tie and quantified as a number associated with the tie. In most cases, the ties are shown with an arrow from the outer node to the core, which indicates that the participant is receiving support from that agent. In some cases, an arrow points from the core to the outer node, which indicates that the participant is giving support to that agent. The INoP maps are intended to show at a glance how and with whom each participant engages in research socialisation. After each participant's INoP was completed, it was shared with the participant for validation through member checking.

Characterising participants

The INoP maps present the characteristics for each person based on frequency of codes. However, to fully represent the participants, the saliency of themes within the interviews – the thematic content that the participant clearly highlights as important and that makes each participant noticeably different from the others – is also relevant. To account for saliency, we needed to revisit the data qualitatively. We worked individually to decide on prominent themes that characterise each participant. To do this, we were guided across the three interviews by the content coding and the completed INoP maps as we captured the individual concerns that each voiced. We then met to compile the key themes each participant identified as salient in their interviews. Focusing on the themes that were unambiguously identified, we worked individually again to map the themes to quotations from the interviews, thereby checking our common understanding of how the participants constructed these themes.

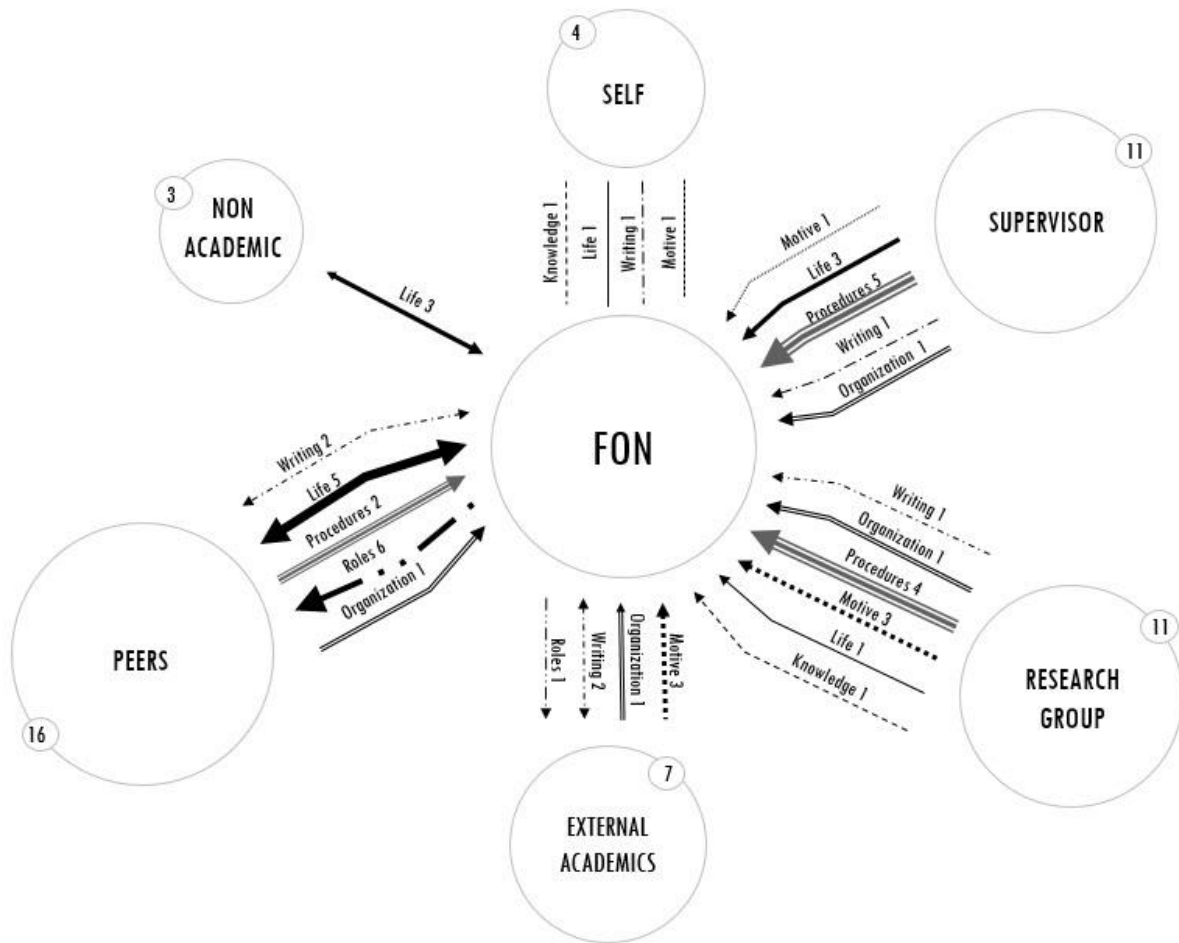
Results

In this section we present the key themes characterising each student that emerge from the INoPs and qualitative analyses. The themes are illustrated with excerpts drawn from the interviews. The four case studies are presented in order of the students' entry into the PhD programme.

Fon

Fon is a Thai female with BA in anthropology and an MA in ELT. She is a lecturer at a university in northeastern Thailand, and was awarded a scholarship for the PhD from her university. Prior to starting her PhD, she conducted two research studies in her department, and attended an action research workshop in Singapore. At the time of the interviews, Fon was just completing her thesis, which focused on teacher training.

Figure 1. INoP map for Fon



Fon's INoP map (Figure 1) shows a wide variety of links for both content and agents. Most obvious is the major influence of peers on Fon. She was a popular and sociable member of the PhD body, and as such she had developed a large peer network. As she said, "I'm friends with a lot of people" (Interview 2). Perhaps because of her senior status as a PhD student, Fon was notable for the assistance she gave to her peers, indicated on her INoP map by arrows to the peers. The largest single tie on her INoP map is for Roles and Responsibilities to peers, and this is the largest value for Roles across all four students included in the study, indicating that she was starting to take on the expected roles of a researcher. Her help included managing bureaucracy, translating and giving research guidance. In this excerpt (Interview 2), Fon talked about her relationship with an international PhD candidate who had recently moved to Singapore.

- F We kind of have each other's back. The stuff he couldn't do I would do it for him.
I Like?
F Like translation of the abstract from English to Thai, paying tuition fees.
I You helped him to find out how to do that?
F I paid for him, first, and then he paid back later because he's in Singapore, right? He couldn't do things by himself. Submitting documents. The thing that he couldn't do. The rest of the things that I can't do I gave it to him.

Fon helped her fellow PhD student in a number of ways, and in return she could call on him to help her with "things that I can't do". Fon's assistance to other students was also mentioned in Gary and Som's interviews.

Apart from her network with her peers, Fon's INoP map shows extensive ties with her supervisor, particularly for help with Research Procedures including finding a topic, setting her research framework and designing instruments. In Interview 3, Fon described the importance of her supervisor.

- I So in actual fact, your PhD, the only real serious input for that was your supervisor, she was your main learning –
F Yeah, main change, yeah. She is the main turbine of change, I would say. It was like you make electricity out of the water, right, yeah. She is the main.

For Fon, then, her supervisor was a driving force powering her through her PhD. Tellingly, in a response to a question on the difficulties she experienced with her research, Fon's reply, "I have my supervisor helping me, so I don't see it as very challenging" (Interview 2), is a testament to the support she had from her supervisor during the research process.

In addition to interacting with her peers and supervisor, Fon was notable for conducting non-PhD research, which is reflected on her INoP in the sizable group of external academics. She collaborated with her husband (who has a PhD) and with staff in the faculty's PhD department. In one co-authored paper with a faculty member, Fon talked about her own weaknesses as a researcher and why she benefitted from working with other researchers (Interview 2).

- I So in the paper you were writing with Noi, how did you divide the work?
F Um, we structured it together and then I was the one who write it, and Noi is the one who correct it and rearrange and change stuff, because Noi - she thought too much she said, like, before she start[s] writing something she has to read a lot, she has to wait until she has saturated all the ideas, you know. But me, no, I'm a very careless person, I can just start and write stuff, throwing things together and said, "That's perfect." Because she

has something to hold on to and then she just separates the work, rearrange[s] stuff, you know.

Here, and elsewhere in the interviews, Fon freely admitted to her own deficiencies as both a PhD student and as a researcher. At the end of her PhD, it seemed that Fon had come to terms with the way she approached her researching and writing, and she could make use of her strengths to overcome these weaknesses.

In her approach to her PhD, Fon described herself as more practical than idealistic. In the interviews, Fon made repeated references to very practical motivations for doing her research. In the following excerpt from Interview 1, for example, Fon explained her motivations for joining the programme.

I Why did you choose to study your PhD here?

F I didn't choose. It's serendipitous. I got, there was a scholarship in my university from the Ministry of Education. There were five scholarships for one university. And by that time, all the five were approved, but the last person got a problem so that he has to take away that scholarship from him because of his programme not passed the standard blah blah. So my boss by that time told me, "If you want that scholarship, that one, the last one, you'd better find a place to study asap." So that day was 22nd of February. The only university that [was] still open [for applications] until 23rd of February was here. The rest [were] gone. So I had no choice.

I What made you decide to do your PhD anyway?

F I had to for my job. And why not? The scholarship was there.

Not only were her reasons for choosing the programme at this university "serendipitous", her motivations for studying the PhD at all were based on the practical expedient that she had the opportunity to do so. Far from considering what her personal preferences might be, or what could benefit a possible future self, she opportunistically accepted what was available and accessible.

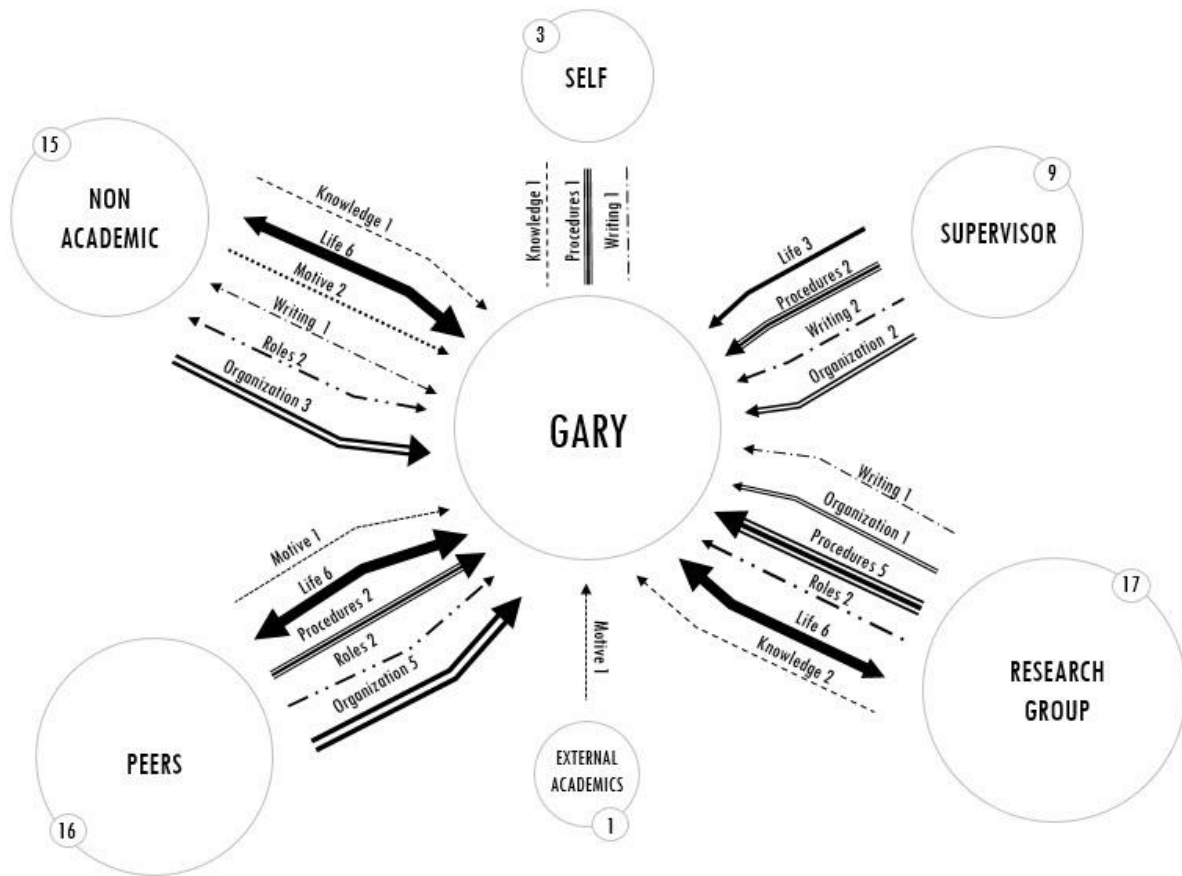
From this analysis, Fon appears to have been socialised as a researcher, conducting non-PhD research and providing research help to others, but she was also more practical than idealistic and self-aware of her own deficiencies.

Gary

Gary, a male Chinese national, was in his fourth year, finalising his data collection and analysis on language teacher identity. This PhD topic was a new direction for him: his bachelor of arts had been in trade, and his master of arts in Chinese minority languages. In addition to the PhD representing a shift in academic focus, Gary also faced the challenges of studying abroad, and in his case broke many of his previous network connections, with whom he had "no contact at all" (Interview 1).

Although Gary had only been in Thailand for four years, his complex INoP (Figure 2) underscores an active socialisation process. The Personal Life ties are conspicuous. Like Fon, Gary is popular and friendly, and interacted on a social level with almost all agents in his network. In his interviews, Gary spoke of close social relationships with his supervisors, his PhD peers and a large network outside of his PhD studies. These ties relating to Gary's Personal Life were not related directly to his studies, but, as he said in Interview 2, they helped him to cope by relieving stress.

Figure 2. INoP map for Gary



- I Does [the network outside the university] help you to cope with your PhD, do you think?
G I think it has nothing to do with my PhD life. I can always go outside to get rid of my pressure. Sometimes I just don't want to stay here all the time, and I feel like once I go outside I should be who I am, and I need to drop the PhD thing, you know.

Two themes regarding agents emerge from Gary's INoP map: the major influence of the research group and a low reliance on supervisors. While Gary had a close personal relationship with his supervisors, he reported relatively low reliance on them in terms of Research Procedures and Research Organisation (Interview 2, in the excerpt in Table 1 to illustrate Research Procedures).

At this stage of his studies, Gary saw his supervisors as available for advice and guidance, but completing the tasks to be done he considered to be his “job”. In contrast to this low reliance on his supervisors, Gary used the research group, and in particular one of the faculty staff, as a source of input for his research (Interview 2):

- I And he's given you feedback on your research.
G Yes, even for my topic, right, the PhD topic I was – during that time I was kind of torn, and even if I I asked [for] help from my supervisors, and they have no idea and they know things but it's not that deep enough, they asked me to go back to Peter, right? So I think I got the inspiration from Peter. I mean it is still the same thing, it's queer stuff, but in the different context, and when it comes to the methodology, Peter said that why not go for David Hayes' paper, because he is the person talking about the narrative study, the life story blah blah blah. Well, okay, fine, yeah, so I think he is very useful.
I The feedback that you've got from him has also been in research clusters, right?
G Yeah, in research clusters. I feel like once I'm here, you know, I realise that the whole community is very diverse and it's vibrant in terms of research, right? We have so many things to do – research clusters and research discussions.

As Gary moved through his research, faculty researchers served as an essential resource for input and advice. As part of the programme, the faculty runs monthly “clusters” and “discussions” where staff and students meet to discuss their research and seek advice on specific issues. It is in these that Gary found valuable support for his research that was perhaps not available from his supervisors.

Fitting with his friendly and sociable nature, Gary's INoP map identifies a large number of ties with his PhD peers. In addition to the input in Personal Life, such as socialising for relieving stress, the qualitative analysis of this node shows that a key feature of his interaction with his peers was bureaucratic. In the interviews, Gary reported getting advice from his peers on resourcing material, finding his research subjects and even earning additional income (Interview 3):

- I Like what? Organising your time? What have your peers helped you with?
G Emotional and also financial.
I Oh, really?
G I mean when we get together sometimes we have to think about how we are going to survive, especially [as] there are so many foreign students here. I think we are kind of reach[ing] up to a certain age when we have to think about money issues, especially some of them, they are just self-funding. So they really need some money to support, you know, studying in a foreign country. So we may think about – we may talk about the jobs, we may talk about, you know, where to work where it is proper for us to work.

As he was a foreign student who was new to Thailand, such help from his peers is understandable. Without an existing knowledge of the network of connections in the community, Gary relied on these PhD peers in the university for help. In addition, Gary's friends outside of the university included a PhD student from an American university who had spent an extended period in Thailand, with whom he felt he could both “hang out” and exchange academic feedback.

Gary's reliance on his social network and the importance it had for his escape from the pressures of his PhD provide some background to a sense of insecurity that pervades his experience. Gary had concerns about his language skills, his lack of background in this new field and his choice of university (Interview 2).

I Last time you said to me all of your connections back at home have gone, there's no support coming from there.

G No, not really. They are even suspicious there: “Why do you have to go there to do your English PhD study, why not go to any other English speaking country?”

I Who is saying this? Your high school friends?

G No, friends from my university, I think. We were doing master's [degrees], right?

Gary was under pressure not only from his study commitments, but also from the expectations imposed on him by his friends and family at home, who appeared to question his decision to study an English PhD in Thailand – a decision about which he was somewhat ambivalent.

Overall, Gary's Personal Life concerns were mitigated by a vibrant network both in and beyond the university with whom he socialised and from whom he received help with the problems associated with life in a foreign country. While writing his thesis, he appeared to work independently from his research supervisors, relying instead on other academic agents within the faculty.

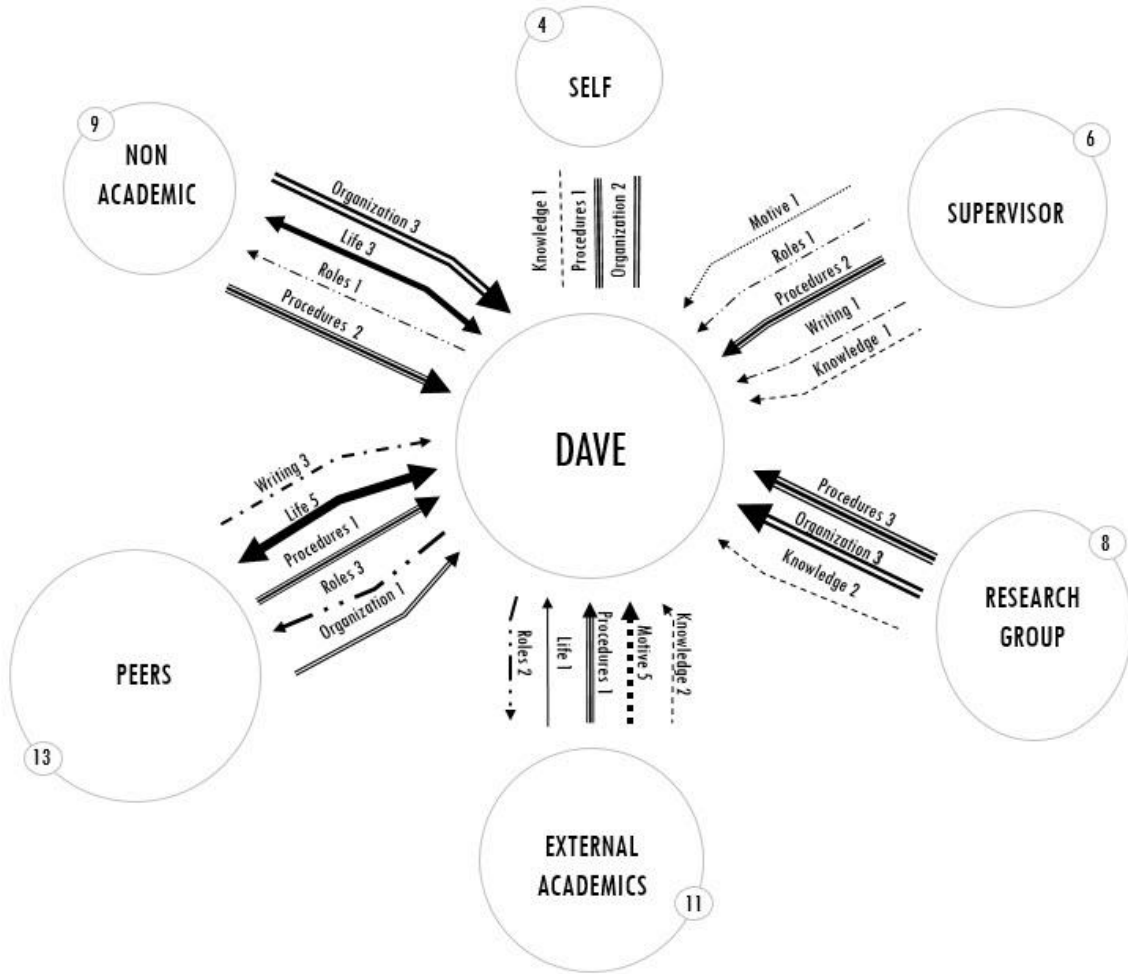
Dave

Dave is an African male with bachelor's and master's degrees in English language from a leading university in his country. During these studies, he also worked in media and as a teacher of undergraduate students. Before arriving in Thailand for his PhD, Dave conducted three research projects, and published one on media discourse derived from his master of arts dissertation. Dave was in his third year, and at the time of this study he was preparing to collect the data for his thesis on world Englishes.

Dave's INoP map (Figure 3) presents balanced strong ties with all nodes. With the large number of ties across many agents, Dave could draw on very varied personal and research support. In addition to his supervisor, the support Dave received included seniors and peers, the faculty staff on the PhD programme, two older brothers who already held PhDs and his MA supervisor and classmates, with whom he maintained contact. The agents that distinguish Dave's INoP most clearly are these latter ties with external academics. Dave also took the initiative in contacting experts in his field of research and engaging with them on topics related to his study, as he explained in Interview 3:

D When I went for, for example, the one in Germany, I was privileged one time to have met him somewhere for a conference and we spoke. But at that time I wasn't even sure what I would be doing for the PhD, so I e-mailed him, reminded him of where we met and that's sort of how we started communicating. For those back home, when I went for my data collection, I actually met them in person and had a chat with them, you know, and all of that. For those in the UK, I just e-mailed them and they were kind enough to be of help.

Figure 3. INoP map for Dave



In addition to this active engagement with international scholars, Dave also built connections with researchers in other Thai universities whom he had met through his peers and at international conferences.

A second distinguishing feature of Dave's INoP is his focus on acquiring knowledge, which he sourced from a variety of nodes: external academics, the research group and himself. In this case, however, a distinction can be drawn between the frequency and saliency of the knowledge tie between Dave and his supervisor. Although Dave has only a single tie to his supervisor for Knowledge Acquisition, the salience of this tie is evident through inspection of the interview transcripts (as shown in the excerpt included in Table 1 to illustrate Knowledge Acquisition). The mismatch between the quantitative and qualitative data on the influence of the supervisor highlights that INoPs based on frequency may not give accurate insights into an individual's network, and attention must also be paid to the saliency of these ties.

Dave's focus on Knowledge Acquisition was one way he showed his overall positive attitude, particularly towards the role of researcher. In Interview 1, Dave expressed his passion for research, and how it led him to his PhD:

- D I mean, one thing I got to realise doing my master's and going through my dissertation was that I fell in love with research. It's – I just realised this is something I should be doing. I loved the process – challenging, yes, but I enjoyed it. I enjoyed it because, you know, I thought, okay, yes, I could do something meaningful, I could make some kind of contribution, you know. I could do something that other people could read and benefit from. This is what I've always wanted, and I saw research as that avenue where I could achieve this, so it made me develop a strong like for research.

Dave was enthusiastic about research, and positive about the challenges and rewards associated with it. The role of researcher had become part of his identity. This can be seen in the way that he connected with other experts (in the excerpt from Interview 3, above), but also in the way he engaged in research outside of his PhD thesis. In addition to his PhD research, Dave was conducting two studies with researchers at two other Thai universities. Adopting this role of researcher, Dave also helped others with their research (Interview 2):

- D Yeah, actually, initially, when we met, when we met, we spoke, you know, we shared ideas together. He thought I would be useful because he was helping Thai students with proofreading their thesis and, you know, editing their works and stuff like that, and so when we talked and he realised that I had done something like this, he said okay, so he wanted me to work with him, that's right. So that's how we started, you know, so he would get dissertations from PhD students and master's students and send them to me to read it and stuff like that.

That Dave embraced the roles associated with being a researcher is clearly seen in a detailed analysis of the interviews, although there is evidence of it on the INoP map in the directionality of the Roles and Responsibilities ties with the non-academic, peer and external academic nodes. Dave's overarching positive attitude towards research suffused the interview.

A final aspect of Dave's INoP relates to his status as a foreign student. Like Gary, Dave was new to Thailand and arrived with few contacts and no existing network. To survive, Dave actively developed his network, both socially and professionally, and drew on it to cope with the cultural

demands and the university bureaucracy. In addition to help from the faculty administration staff, in Interview 2 Dave spoke of the help that his classmates and seniors had given him with the mundane necessities of settling down in a foreign country.

- D When I came that time, I needed some help with accommodation and a lot of stuff, getting around, getting a SIM card and all of that, and you know. So the dean, at that time Ajarn, you know, Onsiri, called Rote because he was my classmate, [saying,] “Okay, wouldn’t you mind helping Dave?” and blah blah blah blah blah. And he accepted to help, you know, and he was so nice, and that’s how the friendship started. You know, he told me, “You know, whatever you want, just tell me.” I mean, Rote was always present, if you know what I mean. I mean, I can really rely on him, he was dependable, really reliable, you can call him at any time and he will be right there.

In sum, Dave's INoP shows that he drew on varied personal and research support, was highly engaged with researchers outside of the university network and actively engaged in gaining knowledge. The saliency analysis of the interviews highlights Dave's love for research, his passion to take on the roles of being a researcher and the positive attitude he brought to the research process.

Som

Som is a Thai female with bachelor’s and master’s degrees in English language. She was in her third year, and was collecting the data for her research focusing on learning vocabulary. Prior to beginning her PhD, she had first taught English at a bilingual school before moving on to a post as a university lecturer. Som was ambivalent about her status as a researcher: “I don’t like research, but I found out also that it’s part of our job, it’s part of [being a] teacher, so you need to do research. And I think that if you – if you do research, you should do it properly” (Interview 2).

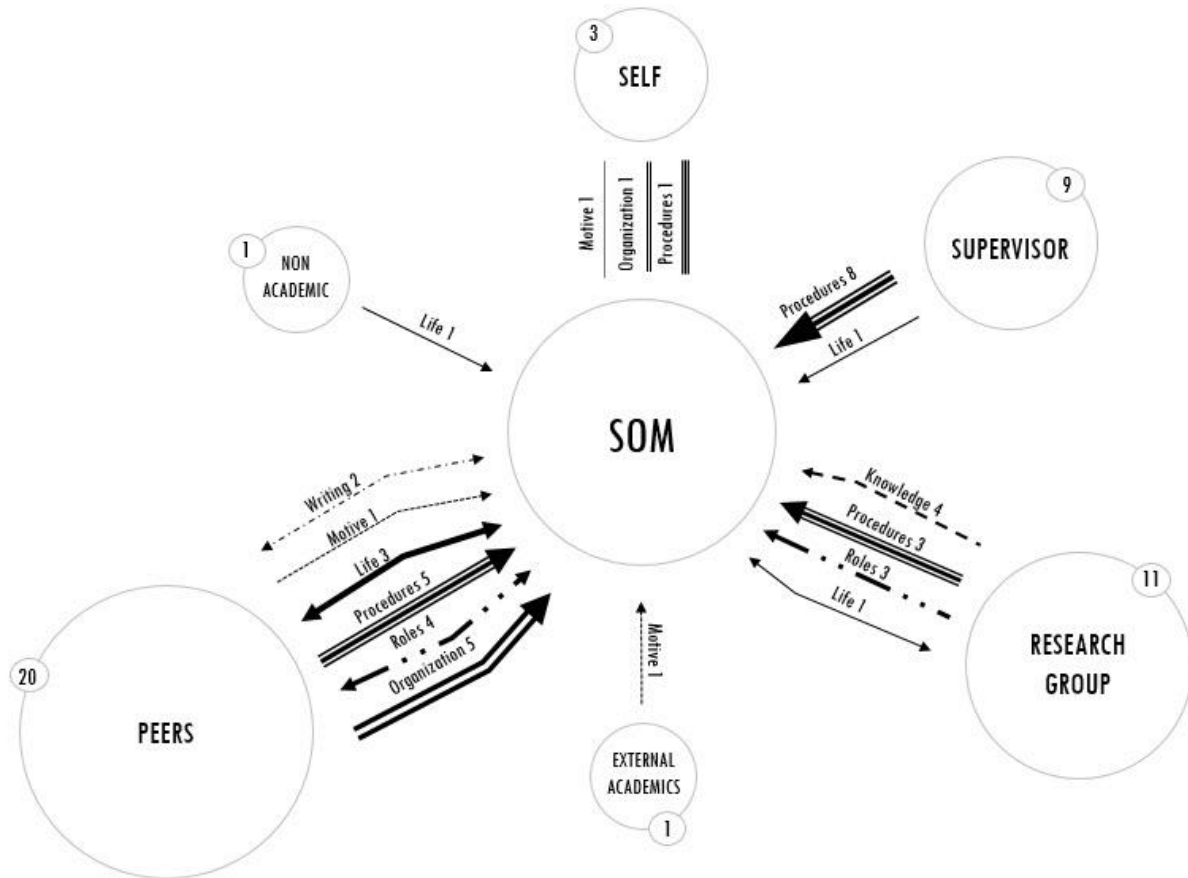
Som's INoP map (Figure 4) shows a relatively heavy reliance on the networks within the university, and a limited orientation to networks beyond it. Notable is Som's large peer network, which dominates her INoP. First, this peer network was an invaluable emotional support. In Interview 2, for instance, Som explained how her peers supported her during a personal crisis.

- S At the beginning, I thought, “Why it happened this time?” You know. I'm far away from home, like, should I go back? And, you know. But Pee Nuth – the relative of Pee Nuth had the same problem, Ian's father also got stroke, so we talk. And then, yes, and I have some kind of relief, and I telephoned. And if I have time I fly back, yeah, and go back.

In addition to her relationships with seniors like Nuth and Ian, Som spoke about her relationship with Fon, who had also been important in supporting her through both personal problems and challenges with her research. Fon and Som shared the same supervisor, and Fon's mentoring had guided Som through the early stages of the programme.

The second function served by Som's peer network is guidance with her research, indicated by the Research Procedures and Research Organisation arrows on her INoP map. Som had help from her peers on a variety of issues relating to the implementation of her research, including working with her supervisor (as shown in the excerpt included in Table 1 to illustrate Research Organisation), sourcing participants and collecting data. As she explained in Interview 3, discussing her research with her peers helped her formulate ideas, and expanded her thinking before she met her supervisor:

Figure 4. INoP map for Som



I What's the difference between what the supervisors give you and what your friends give you?

S The supervisor and friends? ... Every time I talk to my supervisor I can get, like, the clearer stage or track that I think I can continue, but talking to friend I got options. So I got, like, for example, I got three options, and then when I talk, usually I talk to my friends first, yes, and then I got three options.

Som could explore ideas relating to her research with her peers before she met her supervisor, giving her more confidence and clarity during her supervision meetings.

Som's ties to her supervisor on the INoP indicate a very narrow range of content compared to the other three participants, limited almost exclusively to Research Procedures. Inspection of the interview data, however, indicates that Som's supervisor was a major influence in key research issues, such as choice of topic, and in decisions about the subjects. In Interview 2, Som spoke about her supervisor's guidance with data collection procedures.

I How did you decide on that?

S For the for the recording actually, how do you say, first we are going to focus on the vocabulary use of the students in speaking only by using the, how do you say, the programme to calculate it, and Ajarn Jumjim also suggested we are going to gear it into the learning – okay, the educational field. So we need to add something more. And then she suggest[s], how about the students' strategy in planning the speaking, so we add the interview, yes.

Instructive here is Som's pronoun use in this excerpt to refer to her research, giving joint ownership of it to her supervisor. While the INoP map may indicate limited influence, Som saw her supervisor as playing a key part in the direction of her research.

Som drew on support from her seniors through a wide range of content ties, and from her supervisor for her research, but she reported various elements of her PhD life that she felt she could adequately handle independently. For instance, in Interview 2, Som said she felt completely self-reliant in exploiting resources and exploring the literature.

I How about finding references and reading works?

S I start from searching keywords about the topic and then, starting from a very small point – and then after that I searched for the paper, like, which topic's relevant to the keyword, and then I go for the other paper, for example, who will be the participants and in what area, and how to learn. For example, I do the vocabulary. So I have to divide the topic into subtopics, and I searched for article about those subtopics.

Som's self-reliance, especially with reading and resourcing, may indicate her growing confidence as a researcher, but was set within the restricted context of her network of seniors and her supervisor within the university.

This growing confidence as a researcher within the confines of her university network is also evident in her willingness to assume the role of supporting her peers and seniors with their research, as she explained in Interview 2 (as shown in the excerpt included in Table 1 to illustrate Research Writing and Communication). Although the senior referred to in this extract had almost

completed her thesis, Som felt at ease with sharing ideas related to writing, a sign of her confidence as a fellow researcher.

Outside of the university, Som's academic network was marginal. The faculty arranges for visiting experts annually, and PhD students are encouraged to participate in international conferences. At this stage of her thesis, however, Som had not found any reason to reach beyond her immediate university network, as she explained in Interview 2.

- I And your people back at home?
S No.
I They don't help?
S No.
I Did you attend any lectures from a visiting professor?
S Ajarn Gordon, Ajarn Leonard, the two.
I Were they influential for your research at all?
S No. At the beginning, Ajarn Leonard was talking about narrative, which I don't know what the enquiry is that, before I don't know what it is. Yeah, I know it's like telling stories, yeah, but in my study it's not – it's not relevant. But for Ajarn Gordon it's [the] internet of things. I don't think it's – I don't know, I don't think I can apply it for my study.

Som apparently accessed sufficient resources within the university to carry her through her research, and found little to be gained from accessing her previous networks or the visiting experts.

Som's INoP map has highlighted how her research socialisation was largely limited to members within the university, dominated by her peers, and largely excluded all external ties. The saliency analysis highlights how her peer network helped frame her ties with her supervisor, and shows that while there were quantitatively few ties with her supervisor, these were crucial in guiding the direction of her thesis.

Discussion

Although we have argued that using INoPs to investigate research socialisation is methodologically innovative, in many ways the methodology of this paper is typical of studies in the area. Of 13 recent studies into research socialisation, 10 used interviews as the main research instrument (as did this paper), and of these 10 studies, nine used coding as the principal method of analysis (as did this paper). This paper, then, follows the prototypical methodology for investigating research socialisation of coding interview data.

The use of INoPs, however, does distinguish this paper from previous research using interviews to investigate PhD students' experiences. The studies presenting interview data qualitatively generally use one of two ways of presenting the results, depending on the research purpose. First, where the research purpose is to identify themes or stages common to most students, the findings are organised into sub-sections, each representing a theme (e.g. Bircher 2012; Gardner 2008). In such research, individual students are subsumed into the group with quotations from individuals presented as exemplars of a theme typical of the whole group. It is rare for a clear picture of individual students to emerge. Second, where the research purpose is to examine the experiences of individual students, the findings are presented as a series of case studies, one per student (e.g.

Kim 2018; Sala-Bubaré & Castelló 2016). Such research prioritises individual experiences over shared themes. One problem with this type of case study research is that it is difficult to quickly grasp an overview of the individual experiences and to see how they differ, as this requires reading the full case studies. The current paper presents the findings as a series of case studies, but the INoP maps provide a quick overview of each individual. For example, a comparison of Figures 3 and 4 quickly reveals that Som relied heavily on her peers, whereas Dave sought help from a wide range of agents. Such quick overviews may aid readers' understanding and encourage comparisons.

While the previous qualitative studies into research socialisation, whether organised thematically or by case, are valuable, we believe that the mixed-methods data analysis approach in applying INoPs provides further benefits by accounting for both the frequency and saliency of themes. Since INoPs are largely frequency-driven, some findings may emerge that might be overlooked in a purely saliency-driven qualitative analysis. For example, in the INoP maps in this study, the proportion of ties to the research group across all four participants highlighted the importance of the faculty staff and the faculty's organised activities, an issue which might be disregarded in a saliency-based analysis. The frequency patterns identified through the INoPs also provide input into the qualitative analysis, thus reducing the reliance on researcher interpretation.

It is important to acknowledge the limitations of INoPs as we have presented them in this study. Our goal has been to keep the INoP maps relatively simple to allow data patterns to become clear. Therefore, our INoP maps differ in a number of ways from those in Zappa-Hollman and Duff's (2014) study. First, instead of nodes representing specific individuals acting in the network, we have used the nodes to represent agent types. While this allows the relationship between the agents and the content of the experience to be more easily identified, the influence of specific individuals (other than the supervisor) is obscured. Our maps also do not show ties between two individual agents (who are not the participant), as Zappa-Hollman and Duff's INoP maps do, meaning that we lose information about how the whole network interacts. In addition, our INoPs conflate different individuals into a single agent type. For example, university administration staff and the students' family and friends are categorised together as Non-academics. This single grouping may mean that certain details about the specific influence of individuals in these groups are hidden. These adaptations may risk disregarding potentially important details, but they prioritise the clarity of the patterns in the students' socialisation.

By presenting findings for individual participants, INoP maps highlight the differences between participants and how the process of research socialisation can vary. In this study, for example, Fon was practical and pragmatic, whereas Dave, who "fell in love with research", was idealistically driven; Som relied almost exclusively on networks within the university, whereas Dave sought to build external networks; Som's primary focus was on Research Procedures, whereas Gary was often concerned with relieving stress through his personal networks; and Gary relied far less on his supervisors than the other participants, for whom their supervisor was a key driving force in their studies. Highlighting individual differences such as these serves as a caution against a "one size fits all" approach to PhD learning and research socialisation.

Although the INoPs highlight these individual differences, there are some commonalities across participants. All four participants identified their peers and the research group (in other words, faculty staff who were not their supervisors and faculty-organised academic activities) as social agents having a major impact on their studies. Regarding the content of the experience, all four participants were generally most concerned with Research Procedures (the experiential learning of the research process aspect of their PhD) and with their Personal Life. These findings are similar

to those of previous studies into the research socialisation of PhD students (e.g. Baker & Pifer 2011; Gardner 2010). Most previous studies have been conducted in North America or Europe, whereas this study was conducted in Thailand. The similarities in findings suggest that the influence of an international academic culture takes precedence over more local factors, such as national cultures.

This study supports findings from previous research on the socialisation of PhD students that have implications for the administration of PhD programmes. Two notable conclusions from the data are that the PhD socialisation process is accomplished through a variety of agents beyond the influence of the research supervisor, and that each student creates and relies on a unique set of networks. Students in PhD programmes, therefore, need access to a wide variety of resources and agents. The importance of the peer group, notable in Fon and Gary's INoP maps, has consequences, especially for programmes that include part-time or distance students, and suggests that institutions look for ways to help students build productive relationships with their peers, such as by providing a common room or shared office space for students, or through encouraging collaborative projects with peers (Gardner 2008). The value of the activities within the research group, as highlighted in the INoP maps of Dave and Gary, supports the inclusion of workshops or seminars that allow PhD students to become part of the research activities of the university faculty, thereby giving students opportunities to interact academically with faculty members who are not their supervisors (Gardner 2008; Weidman & Stein 2003). As Dave's INoP suggests, there is value in expanding the research network beyond the university to include external academics. For this reason, PhD programmes can benefit from creating and expanding opportunities for PhD students to establish relationships with researchers in their field outside of the university through conferences or associations (Sala-Bubaré & Castelló 2016). Finally, there is a need to account for the fact that studying a PhD can be a highly stressful experience for which students need emotional support from a close personal network of friends (Janta, Lugosi & Brown 2014).

By viewing students as individuals, each with their own needs, priorities, strengths and weaknesses, an INoP approach runs counter to certain recent trends in higher education. With more regulation and a greater emphasis on quantitatively measurable outputs, higher education is becoming normalised, with an increasing pressure to conform to a single model of excellence (Hazelkorn 2011; Johansson, Wisker, Claesson, Strandler & Saalman 2014). These changes mean that PhD students' performance is increasingly being viewed in terms of how closely it matches generic quantifiable targets. Yet, "the socialization of graduate students is not monolithic" (Gardner 2010, p. 76), a fact that the INoP maps highlight clearly. PhD administrators need to ensure that PhD students are treated as individuals. This may involve allowing, or even encouraging, flexibility in how students progress through their research, using more open-ended qualitative instruments to gain student input into PhD programme quality assurance and providing more individualised support that allows students to choose the agents that they view as most appropriate for a specific purpose.

Conclusion

The interviews with the PhD students highlight the value they placed on the interactions with their individual networks. In Interview 3, Dave remarked, "networking is a must because you cannot just do research alone." It is through these networks that the students navigated their way through the demands the course placed on them, socialised themselves to their new professional status and garnered important emotional support as they progressed. The INoP maps visually present the

idiosyncratic nature of the networks formed during this socialisation process, highlighting the ways social agents and the content of the experience combine for each individual.

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