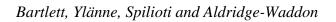Tom Bartlett, Virpi Ylänne, Tereza Spilioti and Michelle Aldridge-Waddon

Nursing handovers as unbounded and scalar events

Abstract:

In this paper we analyse data from nursing handover meetings in terms of the interplay of different voices that operate at different interactional and institutional scales. We suggest, firstly, that the handover is not a single bounded event, as suggested in previous literature, but rather a gradual moving in and out of focus of a particular discourse activity; and, secondly, that while different phases within the handover as an extended event are characterised by voices operating at a specific scale, there are continuous movements between scales in each phase. This leads us to suggest two categories of rescaling as an activity: *translational rescalings*, as the handover shifts between phases and from one scale to another, and *digressive scales*, in which the scale of interaction that typifies a specific phase is temporarily interrupted by another. We illustrate how both these categories serve important revoicing functions and, on the basis of this analysis, extend the use of scales theory in interactional linguistics through the addition of dynamic systems theory and a-curve distributions, in which 20% of token types predominate, while the remainder, or tail, perform essential complementary activities that over time can open up space for gradual shifts in the characteristics and overall function of the activity itself.

Keywords: Scales Theory, a-curve, dynamic systems, nursing handovers, translational rescaling, digressive rescaling

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Introduction: Roles, goals and scales in nursing handovers

The data in this paper was recorded at an urban hospital in Wales in early 2016 as part of an ongoing research project, initiated by the local Health Board, into what makes for effective on-ward management, where effective is taken to mean simultaneously facilitating patient-centred care while safeguarding staff wellbeing. The ward from which we collected our data had been identified as highly effective in these terms, but the means by which this was achieved were not obvious. In consultation with Health Board management, therefore, we opted for an open-ended approach research format with no *a priori* assumptions about what interactional or discourse features might be relevant – an approach that could be labelled *data-led qualitative analysis*. The long-term goal of the project is an ethnographic study of on-ward management and the discursive practices of information-transfer and decision-making within and between the different medical professions involved. The focus to date has been on *nursing handovers*, brief meetings that take place at the 7 a.m. and 7 p.m. shift changes and during which an outgoing nurse in charge (ONIC) passes on (primarily) medical and institutional information about the patients on the ward to the incoming team.

The principal outcomes of our research to date have emphasised the multiple roles performed by the nursing staff during the handovers, and, correspondingly, the multiple and often under-acknowledged goals of the handover as an activity (Ylänne *et al.* submitted). Focusing on one particular function of this complex discourse, Lloyd *et al.* (*in preparation*) look at the production of *compassion talk* during handovers and discuss how the handover meeting can be seen as a space where the nursing team is able to re-establish its core identity as a community of practice founded on compassion (Lloyd 2016; Candlin and Candlin 2007). That is, to re-establish a private space, temporarily removed from the increasingly complex demands of multi-disciplinary interaction that characterise the daily lives of employees in modern hospitals (Iedema 2007). The analyses presented in these papers are, therefore, offered as counter arguments to the large body of research on handovers that identifies the concise passing on of medical and institutional details as core talk and views non-core talk at best as an unnecessary digression from the goals of the handover and at worst as a harmful deviation (Mehra and Henein 2014; Manias *et al.* 2015; Mayor and Bangenter 2015).

In our analyses prior to this paper, we had been employing the concepts of institutional roles and the construction of different voices (Cicourel 1972, 1986; Sarangi 2010), such as the medical voice, the institutional voice and the interpersonal voice, in order to tease apart the interwoven activities performed during the handover and to account for the discursive mechanisms by which they are realised. During the production of these papers, and as a consequence of growing collaboration between the Centre for Language and Communication Research at Cardiff University and the Babylon Centre for the Study of Superdiversity at Tilburg University, we began to think of these changes in voice as indexing movements between different, but interacting, *scales of discourse*, and in this article we contemplate what the concept of scales can add to our analysis of the handovers and, conversely, what our analysis can add to the concept of scales – a concept which, for better or worse, has proven rather fluid in the literature to date.

The notion of *scales* (Blommaert 2007; this volume) implies, firstly, that modes of discourse operate across different spatial and temporal parameters and, secondly, that in order to be effective and legitimate outside these parameters, significant features of the discourse will need to be modified and adapted: in other words, the discourse will have to be *rescaled*. At times such rescaling occurs between discourse events, as texts move from one context to another; at other times it is a feature within single events, as participants move between different scales

for strategic purposes. In this paper we look at such scaling and rescaling practices in nursing handover meetings and the transfer of key medical information between outgoing and incoming nurses. We demonstrate how rescaling is a constant feature of the handovers we observed, functioning either to perform a strategic shift of voice or to translate information from one scale to another. From the analysis we conclude: (i) that the constant process of rescaling enables the nursing staff to achieve a variety of medical, institutional and interpersonal goals simultaneously; (ii) that the nature of communicative events as *complex adaptive systems* means that these diverse goals can be achieved while maintaining the institutionally-prescribed register of the handover; and (iii) that such discursive fluidity blurs the borders of the handover process to the extent that it is best analysed as a gradual moving in and out of focus rather than as a single bounded event.

Sociolinguistic scales – a Trinitarian perspective

The concept of scales has been taken into language studies from systems theory (see below) and, more specifically, from human geography (Swyngedouw 1998, Uitermark 2002) and world system analysis (Wallerstein 1998), where it was developed to account for the stratified and nested nature of social interaction. The simplest illustration of the concept is that of the internal interaction of villages, for example, as a unit at one scale, while interaction between villages, often centred in towns as local hubs, functions at a separate scale. The model can be repeated to account for interactions 'all the way up' to multinational organisations and trading blocs. The picture built up is not simply one of differences in size: interactions at the village level are qualitatively different from those at different scales and, importantly, are often not functionally operative at higher scales. Thus, issues of power between those operating at different scales and the limitations on movement across sites, including migration, become central concerns of the model.

   This is the basic conception of scales that has seen the greatest uptake in interactional sociolinguistics, though in this very process of translation and appropriation the concept has undergone a series of modifications and refinements. As a result, it is often hard to keep a hold on exactly what is meant by the term and the work it is carrying out within the wider discipline. Whether this indeterminacy is characterised as a lack of clarity, fuzziness or analytical richness depends on the individual scholar's point of view, and one underlying purpose of the symposium at which this paper was first presented was to consider the undoubtedly fuzzy boundaries of the concept and to discuss how far the concept can be stretched without becoming vacuous.

   From the perspective of the authors of the current paper, the concept of scales has, over time, taken on board three key ideas:

   1. Firstly, though the chronology is undoubtedly fuzzier than the ordinal system allows, the concept means that individual texts and even individual discourses do not take place in isolation, but are inextricably linked to, and draw into themselves, discourses operating over longer *durées*, both spatial and temporal ones, which carry with them both constraints and affordances for action in the here and now – a perspective which goes beyond a simple dichotomy of micro and macro to consider a single situation as the *layered simultaneity* of multiple interlocking scales (Blommaert 2005).

2. Secondly, the concept has very usefully been used to consider the *scope of communicability* of texts,[1] that is the extent in time and space over which a text or discourse is effective, accepted or legitimated and, in particular, how well different discourses travel across physical or virtual frontiers in the age of globalisation – a perspective which raises questions of *voice* and power and the differential distribution of linguistic resources.

3. And thirdly, the concepts of upscaling and downscaling have been introduced to account for the strategic movement from one physical scale to another in practice, often with the twin assumptions that: (i) there is a hierarchical ordering of discourses across society; and (ii) that increases in the scope of reference of a text, from the particular to the general, will correlate with an increase in the scope of legitimacy (Blommaert 2007: 6; for a discussion of *downscaling* see Singh et al. 2016; Rymes and Smail, this volume).

To make sense of *scale*, then, we can perhaps have recourse to the Catholic doctrine of the Holy Trinity and the three persons of God as at once separate and indivisible. In other words, while each of these aspects can be researched as a distinct category, it is only once the analyses are reinserted within the Trinitarian framework that we are able to contemplate them fully.

Scales in Complex System Theory

While this conception of scales, as developed within interactional sociolinguistics, provides a rich theoretical basis for analytical work, other principles from complex system theory (Kretzschmar 2015) have been taken over into theoretical linguistics. In this section we will briefly sketch some of the most influential of these ideas which we believe can add to the analytical and explanatory potential of the perspective sketched above.

In very brief, complex systems theory posits that, by and large, biological and social systems cannot be explained using the linear logic of traditional Newtonian science. That is to say, the number of interactions that are taking place at any time within such a system mean that individual instances of cause and effect cannot be isolated; rather interactions occur in tandem with other interactions or are contingent upon states resulting from the previous interaction of other elements, while these states are localised across the system rather than constant throughout. As a result, you cannot isolate variables in the way necessary to make predictions and test hypotheses in the traditional sense. The most commonly given example of this phenomenon is that of a pile of sand collapsing: while the laws of physics are impeccably observed, the system of interactions is so complex it would be impossible to predict the final shape of the resultant heap. In the words of Kretzschmar (2015: 6):

> Complexity science does not abandon the empirical observation, rigorous methods, and quantitative analysis that characterise modern science, but also does not expect that simple causes can be found for the effects we observe in 'large networks' with no central control, the domain where complex networks can be found.

According to Kretzschmar, speech is one such domain, which means, amongst other things, that the grammar of a language can never be described as a system in the Saussurean sense. A language has no fixed state but is in a constant state of flux; it is *parole* without *langue,* with

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1 This idea has in itself been updated, reconceived and reworded in several papers. One recent formulation (Blommaert, Westinen and Leppänen 2015) refers to the degree of presupposability of indexicals within a text/discourse.

patterns emerging, but never solidifying, as a function of the countless interactions of populations and sub-populations who interact at different scales and who share certain tendencies and expectations at these scales.

So, for example, rather than a single defining bundle of contrasting features, the Linguistic Atlas Project records "242 different realisations of the vowel in fog", rendering the concept of a stable distinctive phoneme dubious at best (Kretzschmar 2015: 22-24). However, the distribution of these realisations, follows what is known as an A-curve, where roughly 20% of the variants account for 80% of the total instances of production. Remarkably, this phenomenon is repeated at different scales, though with different items occupying the top 20% of variants. So, for example, a handful of pronunciations of *fog* may dominate at the national scale, giving the impression of a standard; however, when we disaggregate males from females, or working class from professionals, or young from old, we see that, while in each case the distribution follows the A-curve, the dominant minority of variants is different in each case. At the same time, it is also the case that each population regularly produces forms that are more generally recognised as indexing other groups. Generally speaking, within each sub-group, "nothing succeeds like success": as certain forms become more salient, for whatever reason, they function as attractors, creating the skewed distribution of the A-curve. In evolutionary terms, given the appropriate contingencies, this can result in punctuated equilibrium (Kretzschmar 2015: 4; 9; 121) – a generally slow and steady rate of change with occasional quick and significant changes. In terms of synchronic linguistics, this process of clumping, where certain variables act as attractors and become far more salient than the many variables in the long 'tail', gives the artificial impression of the uniformity that we perceive in dialectal, registerial or social variation, for example.

There are three points we want to take from Kretzschmar:

1. The realisation of linguistic categories within a given population is not absolute but will follow, to some extent, the 80/20 rule (with 20% of the variables accounting for 80% of the tokens and acting as 'defining features');

2. This distribution is relatively constant in shape but varies in contents at different scales;

3. The 80% of variants that comprise the tail at each scale include: salient/defining variants from other scales; formerly salient/defining variants which for that scale that are falling out of use; or novel inclusions that have the potential to become defining elements if the appropriate array of contingent conditions prevails.

However, we should introduce a couple of extra ideas not covered in Kretzschmar's discussion.

Moving beyond lexemes and phonemes, which are highly arbitrary linguistic features, onto higher and more functionally-structured strata of linguistic activity such as registers, the role of the less frequent features in the long tail becomes more significant: rather than just realisational variations of the same function, these are features that contribute distinct if non-defining functions to the language event. This takes us back to a central early idea in complex systems theory. When a colony of ants goes in search of food in response to chemical stimuli received from returning ants, not all of the ants join the foraging party. Although this is the most salient characteristic of the colony as a complex system at that point, a small number of ants stay in defence mode and some others continue to build the nest. As Kretzschmar (2015: 8-9) puts it: "For an ant colony to survive, the system has to be random at its core and not deterministic. If all of the ants were deterministically required to follow the line to and from the food source, the nest could decay and might be lost to attack." This all suggests that, when

dealing with levels of language such as register, we can expect successful varieties to exhibit not only non-core variation, but that such variation is often, if not always, functional and motivated, ensuring the 'survival' of the system beyond the immediate event.

Complex systems "are firmly grounded in the quantitative methods of physics, chemistry and biology" (Kretzschmar 2015: 5). And while the theory has been extended to other domains such as financial markets, socially mediated domains such as these are clearly different from the natural sciences with respect to the feature "no central control". While we may still expect enculturated behaviour to follow an A-curve, then, we have to factor in the effects of social control on stabilising "random" behaviour (bearing in mind that what appear to be the effects of power may simply be those in power following the A-curve). In such contexts, and corresponding to the punctuated equilibrium of evolution, Guadeloupe (2008) has suggested the term "coagulation" to cover the idea that at certain times the ceaseless flow of variations seem to come to rest and offer us temporarily recognisable discourse types, or codes of behaviour in context.

Handover data and analysis

We will use the data from the nursing handover meetings to illustrate and discuss these points. The focus of the handover session is the Safe Patient Initiative, or SPI, during which key medical and institutional data from the previous shift is passed onto incoming staff. There is much literature on such handovers, the majority of which stresses the need to avoid, or at least cut to a minimum, digressions from the formulaic transfer of predetermined information (Mayor and Bangerter 2015; Searson 2000; Thakore and Morrison 2001; Tokode, Barthelmes and O'Riordan 2008; see Ylänne *et al.* submitted for a fuller discussion). After the SPI, incoming nurses go to their designated bays on the ward where they have a one-to-one handover with the outgoing nurse from that bay. These two phases constitute the official handover. However, when we were recording these events it became clear to us that the pre-SPI chat which we recorded amongst nursing staff in the meeting room as they waited for the SPI to begin was also fulfilling an important function in relation to the general purpose of the handover. And while the pre-SPI chat, the SPI and the one-to-one all had defining characteristics in terms of the type of talk and the voices (e.g. medical, institutional and interpersonal) that predominated in each, there was leakage of these functions between these phases of the handover as an activity. In the following three short analyses we will demonstrate this slippage and finish with a short interpretation of the data-in-context from the perspective of complex system and scales. These analyses are abbreviated versions of those found in Ylänne *et al.* (*submitted*), where they are analysed from the perspective of voices, activity functions and discourse functions. As stated above, we see changes in voice (a linguistic variable) as an index of changes in scale (a material variable): in other words, speakers use the linguistic resources that are appropriate to and/or reference the spatiotemporal and social scales of their current activities. As such, activity roles are the *mediators between scale and voice* inasmuch as these roles are defined with respect to the shifting scales of activity and are realised through distinctions in voice. Analysing the same data set within the two papers, therefore, allows not just a complementary perspective but sets the groundwork for a more comprehensive framework of analysis.

We will start with the SPI, as this is the centrepiece and defining element of the handover and the phase with the most prescribed format. This phase is clearly demarcated by the outgoing nurse in charge (ONIC), who leads the SPI, as we see from Text 1. As usual, the nursing staff are gathered in the meeting room and chatting when Emma, the ONIC, enters. ONIC's entry

does not, however, mark the beginning of the SPI, as she will both engage in small talk and carry out some administrative tasks in private or with the incoming nurse in charge before signalling the start of the SPI as in turn 1 below. This extract covers the whole of the SPI session, and we see Emma as ONIC formally marking the end of the phase in the last line of turn 12 and interactively in turns 13 and 14.

Text 1 (see Appendix for Transcription Key).

1	Emma	Okay (.) evening everybody (2)
2	Multi	((Laughing))
3	Emma	we've had no cardiac arrests within the last 12 hours (.)
		Not For Resus (.) D5 [FNLNM] (1) D6 [FNLNM] (.) C5 [FNLNF] (.)
		No falls (.) at risk of falls (.) A bay bed 3 and 4 (.) B bay bed 3 and 4 (.) C bay (.) 1 3 and 5 (.) and all of D bay (1) ((clears throat)) trolleys 1 2 3 and 5 (2.5) 7 and 13 (1) urm gentleman on trolley 3 [FNLNM] (.) he's had a POVA (.) initiated (.) urm (.) against his lo:dger (.) his lodger lives with him (.) a:nd takes care of his finances
4	Nurse1	ah yeh
5	Emma	Ur::m (.) he's (1) he's an alcoholic on CIWA-Ar
6	Nurse1	Who the
7	Nurse2	The patient or <the>
8	Emma	<The> patient (.) urm (.) and (.) he was very unkempt this gentleman (.) urm so A and E have initiated (.) a POVA (.)
		just to look at his ho::me (.) u:m (.) circumstances basically (.) and see (.) you know what else needs to get involved (.) no drug errors clinical incidents
		patients giving cause for concern (.) trolley 7 [FNLNM] (.) he's on a naloxone infusion
9	Nurse?	Trolley 7
10	Emma	Trolley 7 (.) he's on half hourly urm (.) obs and GCS (.) GCS is 10 at the moment (3) Trolley 12 [FNLNF] she's being treated for (.) cholangitis and (.) she's on IV anti-biotics there (2) A5 (.) [FNLNF] (.) urm she's been spiking temps throughout the day and she's being treated for urosepsis (1) D1 [FNLNM] he's scoring 7 on the NEWS (.) being treated for lower respiratory tract infection (.) he is on IV anti-biotics and he's been reviewed by the medics frequently (.) throughout the day (2) D4 (.) [FNLNM] (1) this gentleman is sectioned
11	Nurse?	<oh yeah>
12	Emma	<He's > (.) in [name] hospital (.) u:rm we have got an RMN there with him 24 hours (1) they're providing that for him (.) he:'s had a Doppler today he's come in with urm left leg swelling he's had a Doppler (.) but hasn't been reviewed so once it's been reviewed and treatment plan (.) he'll be going back (.) trolley 3 [FNLNM] he's the gentleman (.) that I was telling you about the POVA (.) He's on a CIWA-Ar (.) he gets quite agitated and he's <u>very</u> anxious there (1)
		patients with pressure ulcers (.) D4 [FNLNM] he's got a grade 2 to the sacrum (.) C5 [FNLNF] (.) she's got a grade 2 to the sacrum (.) and trolley 1 [FNLNF] She's got a grade 2 to the sacrum (.) no patients on COPD bundles no blood transfusion (.) infection isolation (.) trolley 4 [FNLNM] (.) he's in the cubicle there because he's neut- neutrapenic sepsis and we had the: (.) cubicle available (2) D1 [FNLNM] he's had one episode of diarrhoea this afternoon sample has been sent but he is on IV anti-biotics (1) pressure ulcer audit done (.) urm (.) a- asked the staff to update the boards (.) no staffing issues (.) we've had 20 admissions (.)
		49 patients on the ward (.) we've got 5 expected 3 by ambulance (.) s- six patients at risk (.) all had appropriate response (.) and one had a diagnosed sepsis (1)
		and that's your whole lot
13	Nurse ?	Thank you (1)
14	Emma	Thank yo::u

During the SPI, the nursing staff are provided with a grid of the ward with the different bays marked and they jot down on these forms both information about the bays they have been assigned to and, in less detail, information about the rest of the ward. This is the institutional and medical information that is prescribed for the SPI and which Emma presents in a highly styled medical/institutional voice in the majority of turns 3, 10 and 12. Here patients are referred to as bay and bed numbers and formal medical terms and standard acronyms are used to summarise the patients' conditions. This is discourse which is operating at the institutional

scale – impersonalised details following a prescribed format to ensure the staff are attending to the core medical concerns of the hospital as an institution and which will be recorded and transferred back up the system as statistical data to be recontextualised in other institutional documents.

However, at the end of turn 3 we see a change in voice as the patient becomes "a gentleman" and personal information is presented – and elicits feedback – until Emma switches back to institutional talk midway through turn 8. We see the same pattern in turns 10 to 12. At these points the talk is no longer operating at the institutional scale but rescaled to the more immediate and personalised context of the team operating on the ward. This is nurse-to-nurse talk at the local level: talk which fulfils multiple functions including team-building, socialisation, apprenticing and detailed individual care advice (see Ylänne *et al.* in preparation on the multiple roles and goals involved and Lloyd *et al.* in preparation for a discussion in terms of compassion talk).

Moving on to the one-to-one phase of the handover, exemplified in Text 2, we see an almost inverse pattern to the SPI as the bulk of the information exchanged focuses on the patient as an individual and brings in personal detail about their background and what has been happening to them since they were admitted. This talk is operating at the scale of the team, not the institution; however, just as with the SPI, we see that the overarching voice is not exclusive, with a spike in medical information in turns 11 and 15 that mirrors the spikes in personal information in the SPI.

Text 2

1	Vicky?	Um (.) her name is [FNLNF] (2) she's a lady that (were) come in (6) ((paper shuffling)) she come i:n earlier o- she originally was in yesterday
2	Gill	Oh right
3	Vicky	Last night (.) and then sent over to come back for a post (.) take ur:rm [FNLNF] has arranged (?) (.) medical sh- she's had ga- gastric sleeve for (.) urm (.) weight loss (.) but previously over °the last couple of weeks (there was) increased alcohol° (as in) you know the 70cl bottles of vodka
4	Gill	Oh right yeh
5	Vicky	She'll drink one of them over three days (1) u::rm (.) so whether or not there is an element] (.) ye:h <there>
6	Gill	<(?she must)> probably (tipped it over her)
7	Vicky	Yeh she had another fall on Monday she said (where) she tripped over the curb (.)
8	Gill	Okay
9	Vicky	U::rm (1) she's got fluids going through now at the minute they probably need reconnecting 'cause (I) took them down for her to go out for a cigarette
10	Gill	Okay
11	Vicky	U::rm (.) it's got potassium going through it but (.) the previous sample had c- clotted so I've just taken her a- urm I took earlier on (.) o::h (.) do you know what (.) I've written in somebody else's (1) I'm not looking for what I've written (.) but they've taken repeat
12	Gill	<repeat U and Es> is it (.) <she's had done> (.) okay
13	Vicky	<I've taken 'em> <ye:h (.)> I think I've written it in somebody (2) I can remember taking 'em (.) (now is this the lady) (9) (whilst looks through papers) (mobile back and forth to the loo) (3)
14	Gill	Yeh (.)
15	Vicky	Urm (.) mobile back and forth to the toilet (1) that's uh- I've put a mistake there (2) quarter to 6 she (took them) 'cause (they there um) she's urm (.) mobile back and forth (1) 45 (2) repeat (.) U and E's (.) ta:ken (3) and with her she's been (defined to) gastro (.) they were going to talk about (.) urm doing a (.) urm (.) blood transfusion because she had a HB of 8 but they've not doing (4) she's for repeated bloods (.) obviously to repeat (1)[U and Es (.) dunno (1)

In general terms, then, the one-to-one represents a consistent rescaling of the information presented in the SPI by means of a team-oriented and practical voice, with the institutional/medical voice that dominated the SPIP resurfacing only in fragments. Given the

more practical purpose of the one-to-one, this rescaling would appear to match form to function while the 'intrusion' of the more institutional voice serves as a warrant for the practical advice exchanged.

Text 3 below comes from the pre-SPI chat. This is the talk that takes place between the incoming staff as they wait, often for up to 15 minutes, for the SPI to begin. The chat follows no official format and there are often several conversations going on simultaneously on topics such as holidays, football, work rotas and anecdotes from the ward. Text 3 is one such anecdote.

Text 3

1	Nurse 2	I s- I was saying to Rhys is she urm (.) is her HB low (.) °cause she was so pale° (.) she was trans<parent it was like four it> wasn't too bad but (.)
2	Nurse 1	<what was her name>
3	Nurse 1	she wasn't here Sunday was she (.) <she's new>
4	Nurse 2	<no>
5	Nurse 2	I don't think so no she was new (.) I was saying is her HB low and (.) especially with her dizziness and everything
6	Nurse 1	how old was she Helen (1)
7	Nurse 2 (Helen)	e::r she- she was probably (.) late seventies
8	Nurse ?	Yeah
9	Nurse 1	aa love her
10	Nurse 2	but you know (.) she was rea- she never looked well obviously (.) sh- her HB was (quite) low she was pale she never looked well (.) but when we moved her from the trolley into bed she was (reading something) she was doing her crossword with <her husband> you know (.) (she was sat there talking)
11	Nurse 1	<o:h never>
12	Nurse 4	Okay
13	Nurse 1	(?) a:w
14	Nurse 2	and he went home quite happy (.) and you know (.) and then I give her a cup of tea <this morning> (1) (my tea) (.) and she said she fel- she like she-
15	Nurse ?	<(?)very quiet>
16	Nurse 2	yeh (.) she felt like she choked (.) and after that (.) she <was poorly>
17	Nurse 1?	<she was (horrendous)>
18	Nurse 2	so she didn't have any £swallowing problems£ there was no reason why (she) couldn't have a cup of tea (1) but <she said (.)> I know £there must have been
19	Nurse ?	<(£Is it your tea£>
20	Helen	something in my tea£
21	M Nurse	it's your tea Helen
22	Helen	actually you made the tea
23	Nurse 1	.hh oh she's £trying to (look) at you now£
24	M Nurse	<((laughing))>
25	Nurse ?	<((laughing))>
26	Nurse 2	yeh she did (.) yeh Katy made the tea (.) eeh it was us-
27	Nurse ?	(you alright)
28	Nurse 2	she said I had my cup of tea and I felt like I'd choked
29	Nurse 1	ye::h
30	Nurse 2	but I don't <think she did> choke (.) I think <she just become short of breath> (.)
31	Nurse 1	<o:h love her>
32	Nurse 1	<Hiya Jul nice to see you again> ye:h

The anecdote above is highly interpersonal in style, with the use of first names throughout, the largely informal and non-technical language, and the teasing with regard to the provenance of the potentially dodgy cup of tea. This is as would be expected in such an informal setting. However, we see in turns 1, 5 and 10 the use of technical language to give extra detail to the story, while as an undercurrent throughout the anecdote (e.g. turns 7, 10 and 18) there is a passing on of standard procedures and best practice in looking after patients and dealing with

on-ward incidents. Taking our data set as a whole, the pre-SPI chats can be typified as operating at the interpersonal scale of the nursing staff as friends and colleagues with the occasional rescaling towards the team and the ward as workplace and further to generalised institutional and medical practice.

Discussion

In all three of the phases of the handover we can identify what might be considered the dominant voices in operation and from there consider the scale at which each phase is primarily operating. We might label this scale the 'default' scale as it accounts for the majority of the data and performs the primary tasks associated with each phase and thus characterises them as registers. That said, it is what hides beneath the riders 'dominant' and 'primarily' that is the central focus of this article, for in each of the phases we see non-dominant behaviour, or the tail of the A-curve, in the temporary and functional rescaling illustrated above and ever present in the data set.

If we take the default scale of each phase, which we can provisionally align with the 20% of the tokens (in this case, tokens of a specific voice) doing 80% of the work predicted by dynamic systems theory, then we can characterise the pre-SPI as primarily interpersonal, the SPI as primarily medical/institutional, and the one-to-one as team-based and practical. In these terms, we can analyse rescaling practices in two interrelated ways: firstly, as rescalings between distinct phases as 'information' from one phase is rescaled to fit the primary scale of a different phase; and, secondly, a movement away from the primary scale within an ongoing phase. So, for example, we see in the one-to-one handover (Text 2) a consistent rescaling as institutional/medical discourse is translated into the default team-scale practical discourse of the one-to-one phase; on the other hand, we see within the SPI (Text 1, e.g. turns 8 and 10) a scaling out from the medical/institutional default as interpersonal and team-scale information is brought in directly, without any transformation. We can provisionally refer to these as *translational* and *digressive rescalings* respectively. Other examples are: digressive rescaling within the SPI as reference to patients switches from examples of medical conditions to named individuals and from bed numbers to people with histories (Text 1, turn 3); translational rescaling in the pre-SPI chat as incidents on the ward become anecdotes among staff (Text 3, turns 20*ff.*); and digressive rescaling in the pre-SPI chat as individual anecdotes are interpreted as case studies (Text 3, turns 18 and 30).

While translational rescalings can be interpreted in terms of the primary functions of each phase as an element within the handover as an unbounded event, digressive rescalings serve more localised functions. Digressive rescalings from the medical-institutional to the interpersonal foster compassion for the individual patient, team-building, the fine-tuning of on-ward care and, not least, light relief for the nurses. Digressive rescalings from the interpersonal to the medical-institutional foster trust-building, knowledge transfer, socialisation/apprenticeship and the building of communities of professional practice (see Ylänne *et al. submitted* for a fuller discussion of these 'multiple goals' and Lloyd and Bartlett *in preparation* for a more focused discussion of Compassion Talk).

Returning to the A-curve of dynamic systems theory, we see, as expected, different voices, and the scales they represent, dominating within individual phases. But we also see a significant tail of non-dominant voices and, as with the variations Kretzschmar discusses, the features in the tail are not random noise, but traces of the dominant features from different phases of the handover and from related discourse events. And as with the ant colony, non-determined behaviour is a necessary feature of social interaction: just as it is essential that a minority of the colony remain in nest-building and defence-mode even when confronted with the chemical stimuli that prompt the majority to rush off after food, so it essential that there is a measure of

interpersonal and compassionate talk maintaining the caring principles of nursing as a community of practice even in the most institutionalised of discourse events and, conversely, that there is a measure of institutional talk in the pre-SPI chat that binds the nurses not just as friends but as colleagues. This takes us back to the Trinitarian perspective. We have identified the first two persons of the Trinity in that our data distinguishes different default scales of discourse for the three phases of the handover and we have illustrated the movement between scales, as either translation or digression. In terms of the third (but coequal) person of the Trinity, layered simultaneity, it then becomes necessary to consider the handover as a whole within the wider institutional and sociopolitical context of healthcare. There is not space to dwell on this here, but elsewhere (Lloyd *et al. in preparation*) we situate our discussion of the handovers in terms of the changing nature of hospital work, the need for multidisciplinarity and the corresponding focus on clear and succinct information transfer, all of which can result in a loss of compassion within the system, as recognised by the Royal College of Psychiatrists (2015) amongst others. Our analyses can therefore add interactional detail to the introspection within the UK's National Health Service as it comes to terms with the recent high-profile cases of institutional breakdown, such as the Mid-Staffordshire Health Trust, in which lack of compassion was cited as a major contributing factor (Royal College of Psychiatrists 2015:1).

Conclusion: Voice, scales and legitimacy as fluid hierarchies

Beyond the specific relevance to nursing handovers as professional discourse, our analysis makes a significant contribution to the theory and practice of applied linguistics in three specific areas. Firstly, the concept of scales, situated within dynamic systems theory, can extend the interpretative scope of approaches such as activity theory in enabling analysts to move beyond seeing distinct voices in categorical terms (*cf.* Kretzschmar 2015:198) and rather to think of the distribution of voices within particular contexts – not just the dominant 20% of the A-curve, but also the function of the 80% less frequent but not-so-random features in the tail. From here we can strive to understand the dynamic relationship of these functional distributions as they 'move' across events and across times within the modern hospital as a complex dynamic system.

Secondly, and relatedly, rather than understanding communicative events as single bounded units, a better understanding is achieved if we view such events as gradual comings into focus. Thus, while the SPI might indeed be seen as the focal point of the nursing handover, we see: (i) that its communicative function is prospected in the pre-SPI and reprised in the one-to-one handover; and (ii) that the talk in the SPI itself represents a layered simultaneity of discourse from various scales.

And thirdly, the analysis presented here brings into question the standard view of scales, discussed above, as hierarchically ordered and with increases in the scope of reference of a text correlating with an increase in the scope of legitimacy. Rather, we see in the data a continual shifting between scales that involves a legitimation of the institutional discourse in terms of immediately relevant interpersonal and practice-oriented goals just as much as a legitimation of these more localised goals through reference to higher-order institutional and medical discourses (see Kell 2013 and Bartlett 2012 for similar challenges). From this we can conclude that, while features of talk index the specific scale at which that talk operates in terms of spatiotemporal reference and bounds of legitimacy, these scales are not hierarchically-ordered, but dispersed, partially overlapping and mutually permeable according to the needs and affordances of the discourse in a given context.

Appendix: Transcription Key

(?)	talk too obscure to transcribe/ Inaudible/ Can't decipher word
hhh	audible out-breath
.hhh	in-breath
<	overlapping talk begins
>	overlapping talk ends
(.)	silence, less than half a second
(number)	silence in seconds
:::	lengthening of a sound
becau-	cut off, interruption of a sound
<u>she</u>	emphasis
(words in single brackets)	best guess at uttered words when unclear
((words in double brackets))	contextual information
£word£	laughing whilst saying
[FNLN]	first name and last name (of patient) – if M or F proceeds, it means male and female

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