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Mapping the matrix: using compendium as a tool for recording the analytic group

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Mapping the Matrix: Using Compendium as a Tool for Recording the Analytic Group

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Abstract

This paper describes the application of *Compendium*, a knowledge cartography software tool, for the recording of group process. As a hypertext tool, it enables analysts to visualise connections between people, ideas and information, establishing an evidence base within and across contexts (such as group sessions). After customising its visual language, templates and keyword system, it has been piloted as a research tool for the measurement of group process. This would appear to hold the promise of providing a "digital substrate" for recording, discussing and analysing long term group dynamics in new ways. While the project is in its early stages, early indications are that it is a useful tool which can highlight group process and record change over time. In the longer term, it seems plausible that group processes such as multiple mirroring and identification, and such complex structures as the matrix, could be made visible and researchable through this methodology.

Keywords: *group specific processes, evidence-based practice, research, complexity, knowledge-cartography*

Introduction

In his book 'Therapeutic Group Analysis' (1964), Foulkes made claims for the effectiveness of the method he describes:

> "Group Analysis has an important contribution to make to the study of group dynamics in general, as well as individual dynamics."

He says that our interest is in how people change, identifying group specific factors: communication, location, mirror reaction, translation, condenser phenomena and resonance, which alongside the multi-transference level of the group and the individual and collective unconscious, form the medium through which change takes place.

The systematic review of the evidence of the effectiveness of group analysis, commissioned by the IGA and GAS, and undertaken by the Centre for Psychological Service Research at the University of Sheffield, highlighted the complexity of this process. For this reason, group analysis lags behind some other treatment approaches in terms of evidence based practice. For example, if one looks at the NICE guidelines for work with people with antisocial personality disorder, there is frequent reference to work in groups run along CBT lines. Fiona McDermott (ed. Manor, 2009) says this is because interventions in such a group are controlled for a specific population. She says that all groups are striking in their

complexity, and her description of *"the multiple layers of intersecting interaction and fluid meanings which occur over time"* will be recognised by group analysts. She argues that long term psychoanalytically orientated groups are especially problematic from a research design perspective. Group analysts are being encouraged to find ways to become involved in researching this modality despite its complexity, and in this respect McDermott has some words of encouragement:

> *"...every group can be thought of as an on-going piece of research in action: indeed groups owe their vitality and energy to the fact that they are continually researching and evaluating themselves".*

We became interested in the possibility of undertaking some qualitative research seeking to identify group processes in action in the groups we are conducting in a mental health psychological services department. In McDermott's terms, we are "insiders", researcher practitioners with all of the problems and advantages inherent in this position. According to McDermott, insiders need to have the ability to step back from their practice, ensure that they remain true to their theoretical frame, and seek supervision. She identifies that in this approach *"various recording and monitoring strategies are vitally important"*.

Thus, we were immediately confronted by the problem of how to record and code our observations. Dissatisfied with the depth of insight that could be gained from the conventional notes that result from running group sessions, we were attracted by the potential of graphical representations of group phenomena, introduced next.

Initial work on representing group process

In 'Therapeutic Group Analysis" Foulkes briefly addressed the issue of representing and recording groups. He advocated his system of recording attendances, saying it was proving:

> *"...to be useful in conveying in graphical form a great deal of essential information."*

Murray Cox, Group Conductor and Psychotherapist at Broadmoor Hospital, took Foulkes' ideas further. In his book 'Coding the Therapeutic Process: Emblems of Encounter' (1989) he highlighted the complexity of group processes. He emphasised the visual as well as the auditory nature of the group. He foresaw the interest in psychotherapy outcome and evaluation of its effectiveness, and posed the question of how these group processes could be recorded and annotated for research purposes. One of the answers described in his book is the Group Therapy Interaction Chronogram.

Cox devised a system using circles to represent the individuals in a group (Figure 1). These circles were divided into three to represent the beginning, middle and end phases in a session. There was space in each segment to record the individual's contribution or to make other pertinent comments. Links between members were then indicated by lines drawn between them (Figure 2). Cox saw this system as a partial visualisation, and therefore a clearer representation of the dynamic of a group than written notes alone.
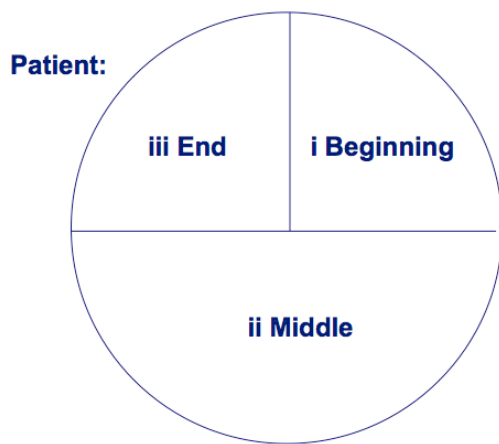
Figure 1: Murray Cox's (1989) Group Therapy Interaction Chronogram: structuring notes on a patient from the beginning, middle and end of a group session
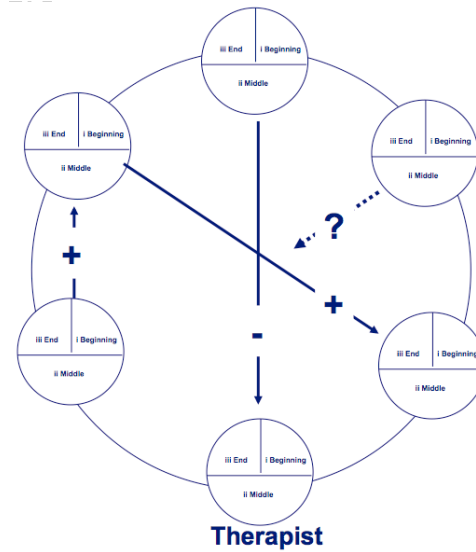
Figure 2: Murray Cox's (1989) Group Therapy Interaction Chronogram: mapping patient interactions in a group session

Useful though this representational scheme is, a large set of diagrams would not readily allow cross-referencing between sessions. The possibility of developing computer-supported maps and databases seemed promising as way to take this concept forward in a more interactive and dynamic fashion.

Computer-supported "knowledge cartography"

A good map filters out noise in order to support specific kinds of interpretation, an example being the map of the London Underground: a highly complex system visually rendered to enable untrained members of the public to navigate it (but correspondingly, of little use to an engineer or geologist). How can we build on and extend the craft of good cartography to visualize contours, boundaries and hubs for "information landscapes"? An active field of research and development in human-centred computing is Information Visualization, which seeks to give visual form to abstract concepts that, unlike physical terrains, have no "natural" visual form. Think about how we might want to visualize data flow on the internet, or social networks. A good visualization relieves short and long term memory load, filters complexity, provides shared reference points, allows clear visual identification of patterns, draws attention to significant phenomena, and scaffolds higher quality joint communication and interpretation.

Knowledge Cartography is a specific research area that focuses on providing software tools to help mappers think more effectively about their problem through the process of constructing maps (Okada, Buckingham Shum and Sherborne, 2008). With this in mind we started experimenting with a software tool called *Compendium*, developed by the Knowledge Media Institute at the Open University. Compendium has been used and validated in both small and large scale projects across diverse sectors in society, and is the result of over 15 years' research and development at the intersection of hypertext, collaborative modelling, organisational memory, computer-supported argumentation and meeting facilitation.

The tool is conceived as analogous to a spreadsheet, but for ideas. Just as a spreadsheet

provides general tools for working with numbers, Compendium aims to provide a visual language and framework for working with ideas and their interconnections. One of its values is making possible the visualisation of connections between people, ideas and information at multiple levels. While there are myriad software tools for creating diagrams, Compendium has a full relational database: every icon in the network that is created is a database entity that can be searched for, indexed with keywords, tracked across multiple maps, and rendered in diverse forms. In principle, this held the promise of providing a "digital substrate" for recording and discussing long-term group dynamics in new ways, as we will now illustrate.

Much of the language used by the Compendium team seems to us to be remarkably compatible with group analysis, correlating with Foulkes' theory of the group working at current, transference, projective and primordial levels. and his concept of the individual as a icon in a social network

Pilot application to mapping group process

Foulkes and Anthony (1957: 66) commented that a homogeneous group *"..is perhaps the most promising type of group from the point of view of research"* as the patients are selected on a common syndrome or problem; the patients start and end together allowing comparison of outcomes. With this in mind, coupled with our own awareness of the difficulties in recording and measuring the full complexity of a slow-open analytic group, we opted to trial Compendium with a closed, 24 session, homogeneous analytic group being conducted by one of the authors. The focus of the homogeneous group was recurrent moderate to severe depressive episodes with an anxiety component. The group comprised 8 individuals, 4 male, 4 female and one group conductor. As indicated by their CORE returns, group members were within the moderate to severe level of mental health difficulty. All had complex personal and mental health histories leading to significant difficulty in intrapersonal and interpersonal relationships in their adult lives. The theme that emerged most clearly at assessment was repressed and/or suppressed anger correlating with severe anxiety/panic and depressive symptomatology. This formed the group focus.

The Compendium pilot involved translating conventional written notes on sessions, into maps that included the prose notes, but made explicit some of the key aspects of group dynamics that we wanted to see visually at a glance, and track more systematically in a computer-supported evidence base. The goal was to track interactions, and the group process behind these, using diagrams to demonstrate critical pathways at work. Essentially, we see this as a way to represent the group matrix, in order to help us identify more clearly the processes at work whereby individual and group change come about.

In the following series of figures, we step through the key aspects of using Compendium in this way, to illustrate some of our early experimentation. Unfortunately we are unable to reproduce colour in this article, but they are available online at the Open University.[1]

Inventing a visual language for a new phenomenon is an iterative process. Through experimentation, we derived a "template map" to be used as the basis of each session analysis (Figure 3).

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[1]   Open University research blog post: Compendium for mapping group dynamics:
   http://people.kmi.open.ac.uk/sbs/2010/03/compendium-mapping-group-dynamics
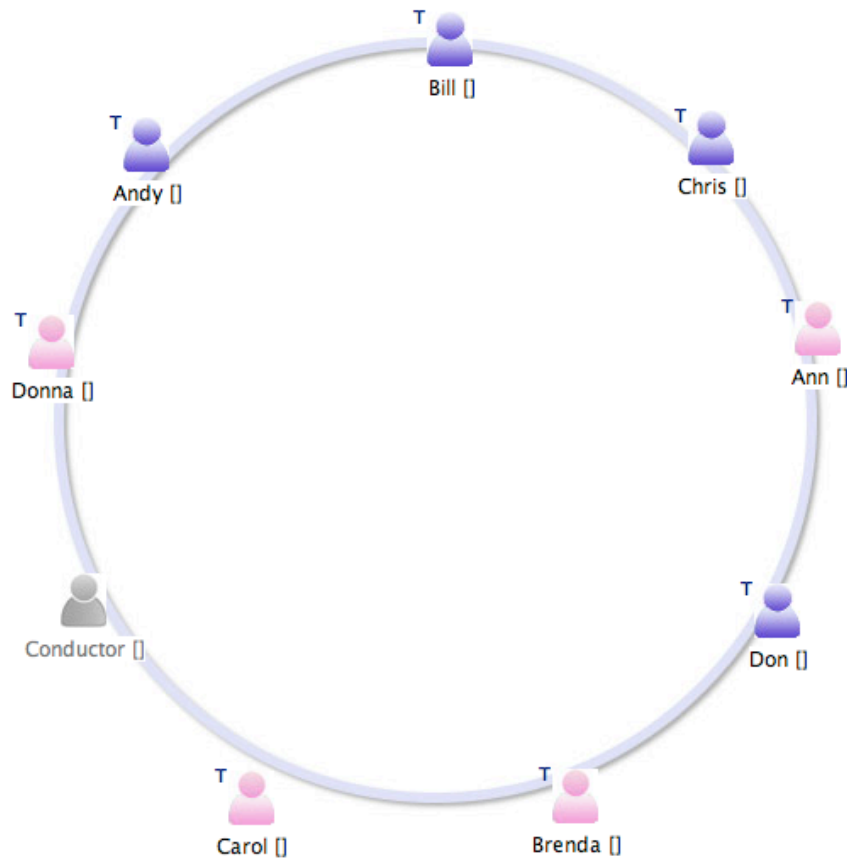
Figure 3: Group Analysis Template Map in Compendium, ready for the conductor to record observations (fictional names)

The basic template is used as a background graphic for the group circle. Icons represent each group participant, using colour to show gender at a glance. The conductor makes the name labels for absent patients grey, and adds a note as to why they were absent in the icon's label (or if preferred, "inside" the icon in the detail field). The conductor rearranges the icons to reflect seating positions. When the template is first loaded, each icon has the patient's name and an empty [ ]. The conductor enters the session number in the brackets (e.g. [1]), since when searching the database later, it is important to know the relevant session. Each icon is already tagged with their name (the "T" by each icon), so that we can rapidly filter the database to see all contexts (e.g. group sessions) in which that patient appears, enabling cross referencing (see the Tags interface later). This also helps to capture recurring elements of the different levels of communication in the group.

The next two figures illustrate how we mapped different aspects of the developing process in a session.
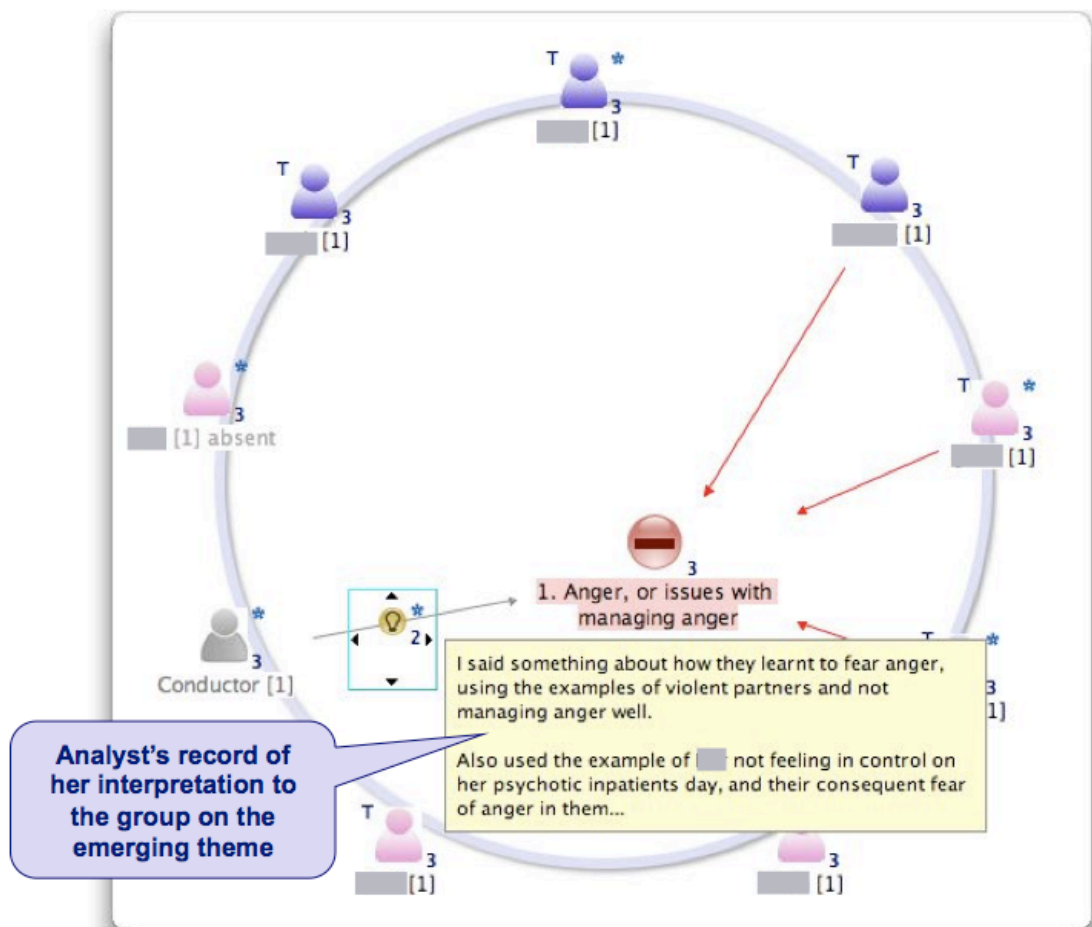
Figure 4: Mapping the "anger" theme in a session. The link from the grey *Conductor* icon on the left, is annotated with a note, which pops up in the yellow box on request.

Figure 4 shows the conductor's mapping of anger, the first theme that emerged. Lines from group member's icons to the 'anger icon' indicate those involved. Although this cannot be seen here, the lines and the anger icon are red, linking the theme. Details of each member's contributions can either be entered into the anger icon or into the individual member's icon by double clicking on the chosen icon. In this way we can incorporate standard written notes into the database. The conductor's intervention in this theme is shown with links from the conductor icon to the small lightbulb icon on the link, representing an idea or thought. Explanatory notes which are hidden within the icon are displayed in the yellow pop-up window, when the mouse if rolled over the icon, as shown above.

Each icon is shown as being embedded in three maps (signalled by the "3" digit to lower right of icons). This is because the icons sit in three maps, each one showing a different theme, as shown in the next two diagrams. Each time a new map is created containing an icon, the embedded number goes up.

Another important moment which emerged in this session (several patients seeking to engage another) is shown in Figure 5. This also illustrates the keyword Tags that have been assigned to a patient to show the behaviours that are being tracked.
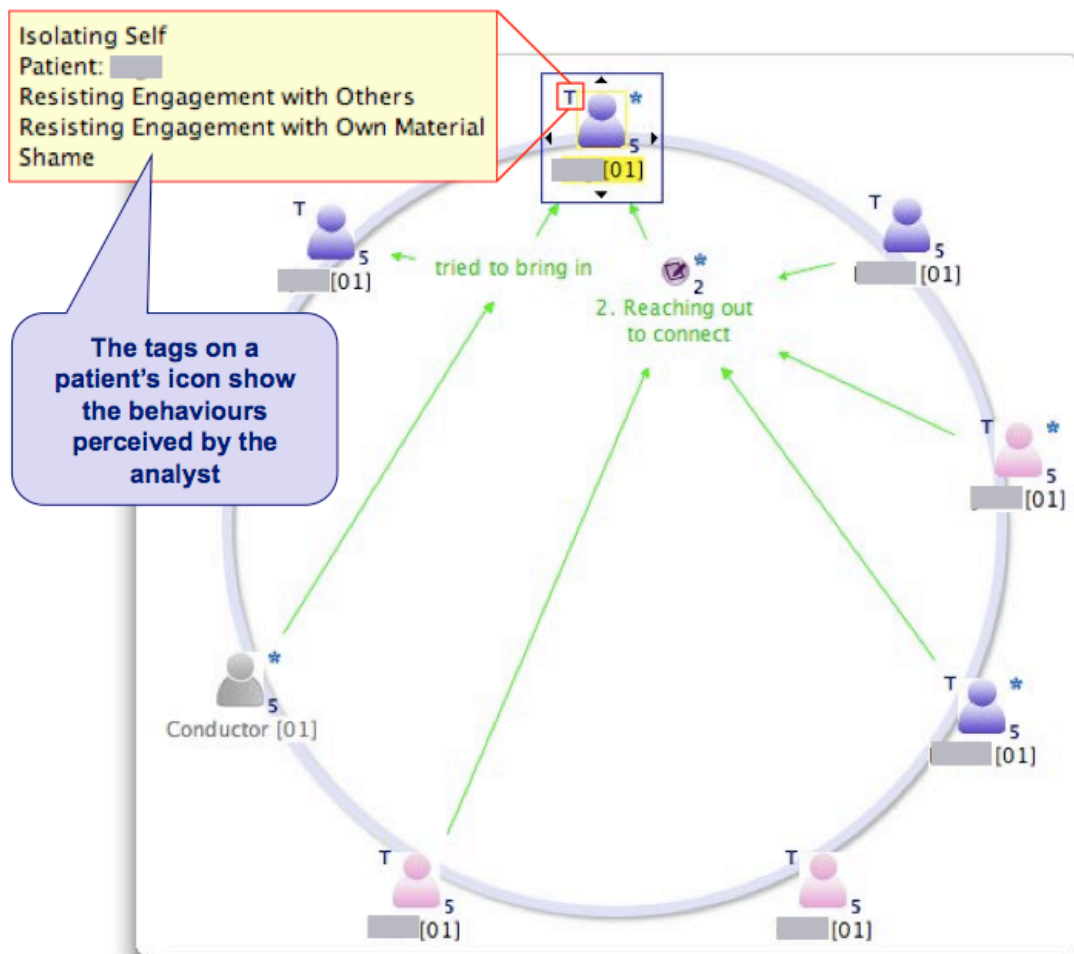
Figure 5: Mapping another significant pattern in the session. This also illustrates the tags on the patient's icon

Figure 6 shows that we can superimpose the diagrams on each other to see the collective complexity of just one session. The importance of using colour to differentiate themes is clear (in grey, this diagram is more difficult to interpret, but we hope readers are able to see something of the emerging process – see the online figures for colour originals). This figure is annotated with additional notes to show other aspects of the visual language we developed.

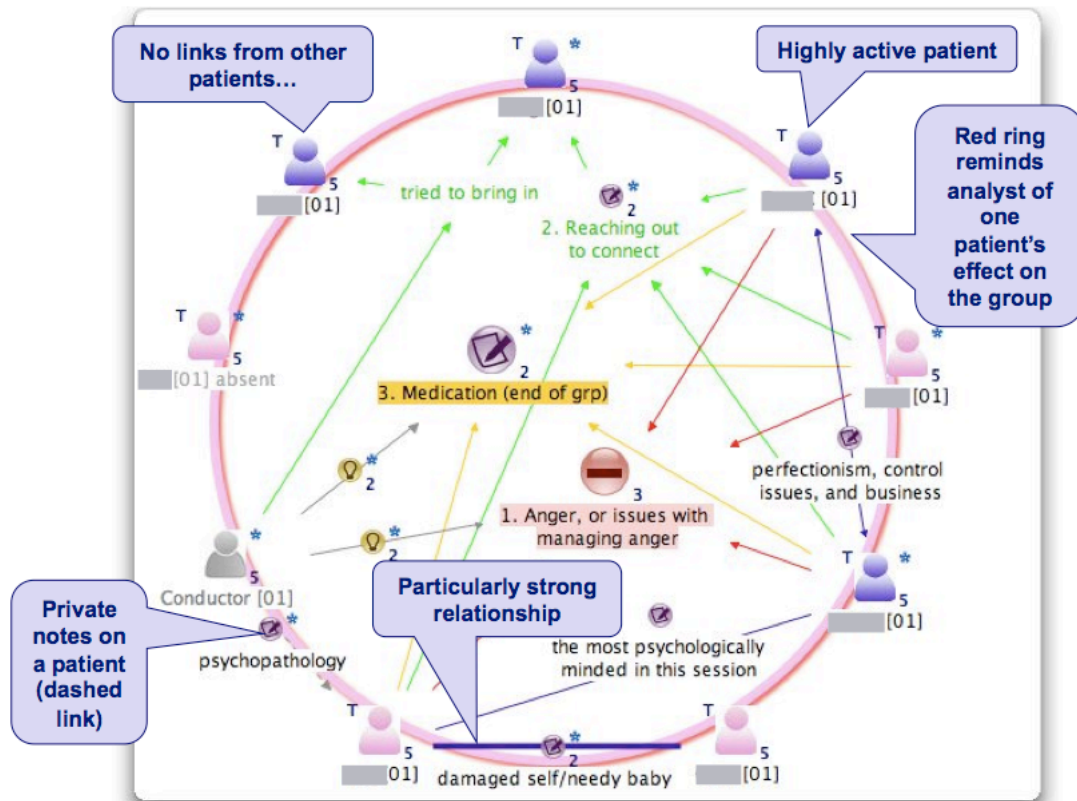Figure 6: Composite map show all dynamics, plus additional annotations to show other aspects of our mapping conventions

To move beyond the limitations of paper, we also need to demonstrate that over time, a long-term evidence base is growing which is also manageable. Figure 7 shows how the database can be filtered and interrogated via the *Tags Sidebar*, which can be opened down the left side of the screen.
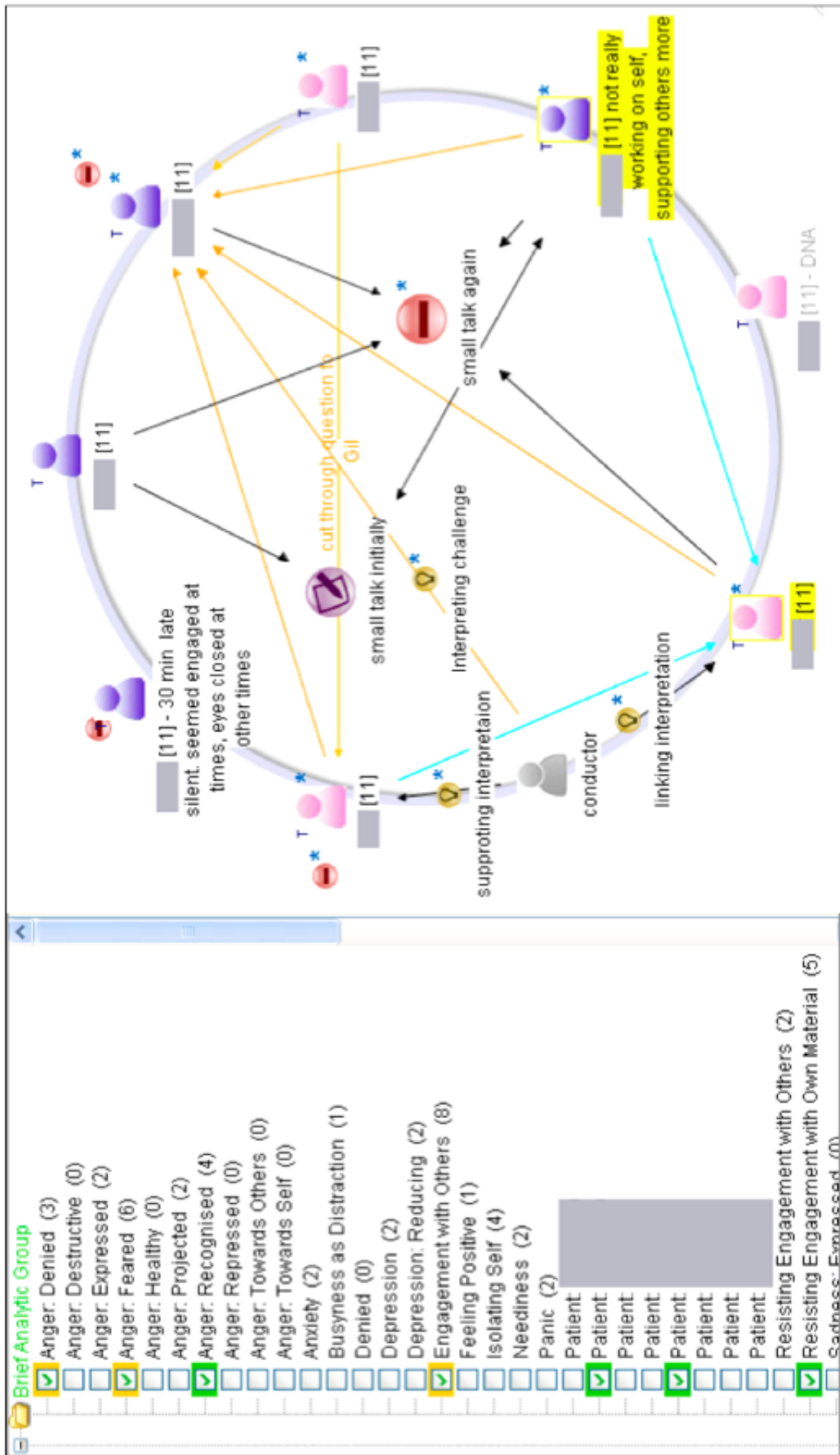
Figure 7: Opening up the Tags Sidebar to show which tags are shared in common by two patients. Tags shared by all the selected patients are highlighted in orange, while tags assigned to only one patient are in green.

The conductor can design tags according to the focus of each particular group. In this case the tags reflected various manifestations of anger, the individual symptomatology, the member's engagement with the group and their awareness of their own psychopathology. While the tags might be predefined in advance, a new tag can be created at any point (e.g. to start capturing a new phenomenon that has been recognised). In each session tags are assigned to the individuals' icons by checking the relevant box, or selecting them from a toolbar menu. Over time, therefore, icons in the network acquire a "tag profile" per session, and across sessions. We can measure group process through retrieving tag data across sessions to see how individual change is taking place, which we can in turn link with the dialogue and specific group factors evident within the session recordings. This allows visualisation of the data over the course of several sessions or over the group as a whole.

The use of tags in this database provides us with a way to detect commonality between members, and the group as a whole. Selecting any icon highlights in orange the relevant tags. Selecting two or more icons highlights in orange tags shared in common, and other tags in green. This gives us the potential to track in a very explicit way the mirroring phenomena.

Having illustrated the expressive potential of a visual language tuned to tracking group processes, the following scenario looks to the future, envisaging how such a tool could be used as part of daily clinical practice:

"Ann has been running a 30 session, once weekly group for patients with a bulimic eating disorder. Half way through she is asked to report on progress, particularly in relation to the frequency of bingeing and purging behaviour. She opens her group mapping software tool, and compares two maps from Sessions 2 and 15. The tags from each of these sessions show quite clearly a reduction in symptomatology which would appear to correlate with an increase in expression of affect, particularly anger and distress. The maps indicate a shift in the dynamics of the group as evidenced by the lines between members. These show an increase in intergroup communication with stronger links being forged between particular members. In accessing the patient icons she sees the links are around attachment patterns, and for some, around issues of abuse. Looking at the intervening session maps she sees that there have been occurrences of conflict in the group. Mirroring between members is also clear, revealed by the emergence of common tags in certain patients.

Looking at this as group analysts it would raise questions around the nature of the process; we would want to know about this in considerably more depth. However for the purposes of auditing, what Ann has discovered is sufficient to demonstrate that change has occurred. If the change compares favourably with outcome measures then we might consider that Compendium is indeed capable of demonstrating change over time.

However the software has also graphically illuminated some of the process that may lie behind the change. We need to learn more about how this can be used to best effect.

Discussion
A good map supports a particular kind of reader in understanding the terrain. By analogy, a good Knowledge Map should help the reader understand the conceptual terrain they need to navigate. In the context of Group Analysis, this would include more effective communication of key information about a group, within and across sessions. Moreover, just as spatial mapping software (e.g. GoogleMaps) enables the user to switch layers of

detail on and off, knowledge cartography software should provide control over conceptual layers to reflect the analytical questions being explored.

In this respect, the pilot work with Compendium gives us evidence of a number of benefits. It enables us to track interactions in the group, identify significant themes, key moments and patterns between members, between members and the group as a whole and within individual members. The technology allows us to incorporate our recording of group discourse by "hiding" dialogue behind individual icons representing group members, or behind icons representing themes between members or the group as a whole. We can use tags to ascribe attributes to individual members in each session.

Bringing these together over several sessions shows us patterns and themes within the group and how the interactions associated with them are influencing change in the individual. These individual changes are reflected in the changing profile of individual's tags.

This is encouraging. However, we are concerned not only with producing better artefacts for communicating to others (e.g. a professional peer, or students). The very process of using a knowledge cartography tool should improve the *mapper's* thinking, directing attention to salient phenomena, adding immediate value to the interpretive process. The analysis should, ideally, not only be more effectively captured and retrievable — it should be a *better* analysis than conventional documentation and evidence practices.

We are beginning to see signs of what this might look like (see the annotations on Figure 6). There are visual properties of the maps that make specific patterns very salient, which are normally buried in prose notes, e.g.

- patients with no connections coming into or out of them stand out, as do highly connected patients
- the thickness of a connection reflects strong relationships of some sort
- if colours are used in a systematic way (e.g. red = negativity of some sort) then that stands out

We have given the example where tags that are common to two or more patients might signal *mirroring*. More broadly, can we conceive of other modelling patterns that might signal the incidence of other significant group analytic patterns? One challenge, therefore, is to investigate how Compendium might signal *location, translation, condenser phenomena* or *resonance*.

Increasing confidence in modelling these phenomena potentially leads to two results. Most ambitiously, we might imagine the tool alerting the analyst, a colleague or a student to patterns of which they were not aware. More likely, however, is the scenario where the analyst discerns that there is a significant dynamic happening in the group — s/he should now be able to *demonstrate* it very explicitly in Compendium. Thus, if one is confident that a patient is showing a mirror reaction to another, one should now be able "prove" it by showing the common tags that they share. If we know that an individual has moved from no interaction, through negative interactions, to more positive ones, then we should be able to show how the session maps have changed.

If Compendium does not confirm this, then it implies either that one is mistaken, or that

the record in Compendium is inadequate, which will lead to improvements to the way in which the sessions have been mapped and tagged. To return to our spreadsheet analogy, if you know that profits are up but the spreadsheet does not show this, then you know that your model is not right: there is a formula missing, or a wrong number has been entered. But if you simply suspected that profits were up, but the spreadsheet proves to be robust, then you have also learnt something.

Future work

To date, it has been individual clinicians using Compendium to map and track their own groups. They defined their own set of tags to correspond with the individual and group dynamics of their particular group, and invented their own conventions for recording phenomena visually. If we wanted to use Compendium to effectively demonstrate the impact of group process in multiple groups run by different clinicians, we would have to ensure that we design a tag profile that is consistently used by all clinicians, and establish a common understanding and set of conventions on how these are used. The same would apply to the use of connector lines and colours. This would need to be trialled by several clinicians before embarking on a study.

To qualify as a research tool the methodology would require a less subjective method of group recording. Sessions would need to be recorded and transcribed. Inter-mapper reliability would need to be demonstrated, analogous to inter-rater reliability in other forms of qualitative data analysis that codes transcripts.

The model in Compendium needs to be "debugged" in order to evidence known phenomena, just as climate or economics simulations need to be tuned in order to show that they generate predictions about past years that conform to known evidence.

As we populate Compendium with more data, in the next phase we hope to explore additional ways of evidencing changes, in individuals and the group, across sessions.

We envisage a number of ways in which the tool could support this:

Group level:
- Compare the maps from two or more sessions by embedding them next to each other in a comparison map, enabling annotation with comparative notes.
- Compare the group tag profiles from sessions, i.e. by selecting all icons in a map, all relevant tags 'light up'. We would hope to see a shift from negative to more positive tags over time.

Individual level:
- Compare the tag profile for a patient over time, from pre-group assessment, through early, midway and closing sessions, to review.
- Compare relationships between specific patients across sessions.
- Look for patterns of co-occurring tags or shifts in tag profile which might be predicted on theoretical grounds, or which are seen as emerging from the data.
- Reflect on the nature and impact of the conductor's interventions (which could be tracked more systematically by devising a set of conductor-specific tags, should that become a focus of research/reflective practice – tags are currently solely about

patient behaviour).

- One untested Compendium feature that may also be useful is the facility to animate maps (rather like building a diagram gradually with animated elements), which could help in the presentation of complex maps. A second feature is video annotation: should there be footage from groups, this can be annotated directly with icons and links.[2]

Conclusion

We are proposing that the ability to visualise interactions and filter an interactive database could raise expectations of how we will evidence group analytic outcomes in the future. Our claim is that computer-supported Knowledge Cartography has a potentially significant role to play in scaffolding the ways in which records are constructed of group analysis sessions, and how that evidence can build over time into a database which can be interrogated.

A tool such as this enables the recording of behaviour, overlaid with conductors' interpretations (possibly from many conductors with different perspectives, should that be required), capable of providing an evidence base for practice as research. Compendium provides new ways for researchers, practitioners and educators to make group processes visible, inspectable and analysable.

We are now actively exploring routes to advancing the work. We are excited about the future trajectories that this work opens up, and welcome reactions and collaborations with colleagues who wish to trial and reflect on this approach.

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[2] Readers may be interested to view a series of podcasts in which a different kind of reflective practitioner (a choreography researcher) demonstrates, and reflects on, the use of Compendium for research and teaching a subject which is hard to quantify, in particular, making use of the video annotation capability: http://projects.kmi.open.ac.uk/e-dance/2009/09/14/choreographic-video-annotation

References

Cox, M (1989) *Coding the Therapeutic Process – Emblems of Encounter*. London: Jessica Kingsley.

Foulkes, S.H. (1964) *Therapeutic Group Analysis*. London: George Allen and Unwin.

Foulkes, S.H.; Anthony E.J. (1957) *Group Psychotherapy: The Analytic Approach.* London Karnac

McDermott, F (2009) Researching Groupwork: Outsider and Insider Perspectives, in O. Manor (ed.) *Groupwork Research*. London: Whiting & Birch.

Okada, A., Buckingham Shum, S. and Sherborne, T. (2008). *Knowledge Cartography: Software Tools and Mapping Techniques*. Springer: London. Book website including the Preface: http://books.kmi.open.ac.uk/knowledge-cartography

Authors

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