Concepts of ‘self’ in delusion resolution

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The concept of ‘self’ has a pivotal role in psychotic symptoms (Conrad, 1958), but its utility in the treatment process has been limited. Since perceptions of ‘self’ – and of ‘others’ – change as symptoms evolve and resolve (Parnas and Handest, 2003), if appropriately assayed this concept provides a unique entry-point through which the congruity between delusions and illness can be examined. The potential clinical value of this cannot be overstated as delusions are frequently associated with poor clinical outcomes and enormous emotional distress (Leifker et al., 2009), which is often not remedied by treatment (Haddock et al., 1998).

Employing a visual ‘mapping’ technique we examined how delusions of the ‘self’ affected one patient’s social world, and how delusional content and sense of ‘selves’ augmented in parallel during recovery. The resulting maps rendered visible the connections between delusions and concepts of the ‘self’ that are usually concealed intentionally or due to lack of insight. Such maps can provide information concerning the origins of emotional distress, and require less time to obtain than dialogue based approaches (Hermans, 2001).

The patient was a 24-year-old female diagnosed with paranoid schizophrenia, stable and undergoing treatment for her first acute relapse. Her participation was in accordance with the Declaration of Helsinki and University of Hong Kong ethical guidelines. She presented with marked persecutory delusions, was distressed about not undergoing treatment and was investigated by her boss (HICLAS analysis by 18 matrix was 10 × 10, totaling 18 persons.

From these responses, we constructed a matrix with one row per person and one column per feature. Every cell in the 18 by 18 matrix was filled with a 0 or 1 based on the patient’s ratings indicating whether each person either did (1) or did not (0) possess each feature (e.g., myself as a friend is not capable). The resulting matrix of 0’s and 1’s was entered into a hierarchical classification (HICLAS) analysis program, which is a quantitative approach that can be employed to create visual maps, in this case of the internal structure of delusions (see Boeck and Rosenberg, 1988 for details). HICLAS works by simultaneously computing the hierarchical associations between the individuals and their distinctive features, which are input as binary ratings. The HICLAS analysis program then linked clusters of individuals to corresponding features that were similarly hierarchically bundled, as illustrated in Fig. 1 (Boeck and Rosenberg, 1988). As a hierarchical model, HICLAS requires a balance between the dimensionality, which determines the number of levels, and goodness-of-fit, which quantifies how well the statistical model fits the raw data. Rank, which is the number of hierarchical levels allowed in the model, quantified dimensionality. Jaccard goodness-of-fit coefficients quantified the goodness-of-fit for each element and for the overall model (Table 1). Based upon goodness-of-fit and dimensional interpretability, a rank 3 model was examined to explore the nature and connection between ‘self’ and others (overall Jaccard’s goodness–of–fit = 0.73).

The resulting ‘maps’ from the initial ratings, when the patient’s false beliefs were prominent and the ratings 53 days later when delusions were resolving are displayed in Fig. 1. The calculations showed the distinctive changes in ratings over time. At the initial time point (Fig. 1a), the patient denied that her delusions were abnormal. By questioning her specifically about the characteristics of individuals without allowing elaboration, we were able to uncover connections between selves and others that the patient either was not aware of or willing to share. For example, her conflicting feelings toward those actively involved in her treatment were revealed. Furthermore, her ‘selves’ were isolated, corresponding to her withdrawing from others. While ‘selves’, family, and clinic workers were associated with positive and negative features, ‘others’ in the workplace were defined by overwhelmingly negative descriptors, likely due to her belief that they were involved in the (delusional) murder of boss #1.

Importantly, HICLAS mappings showed distinctive changes in ratings over time. At the final evaluation, symptoms had subsided and there was a partial reconciliation of the various roles of ‘self’ (e.g., me as daughter grouping with mother) (Fig. 1b). She trusted clinic workers and no longer associated them with ICAC, which was reflected in their prominent positions in the hierarchy attached to influential features. However, her coworkers retained primarily negative features which could be explained by the persistence of her belief that they were involved in the murder of boss #1. A change in the patient’s perspectives of ‘self’ and ‘others’ was concordant with her understanding of her delusions, and highlights the link between the ‘self’, symptoms and changes in the content of (false) beliefs (Dean et al., 2009). However, although the patient no longer explicitly endorsed any of her delusions at the final evaluation, she still struggled in the...
workplace. Thus, regardless of her ability to express this, HICLAS uncovered the persistence of negative features surrounding her delusion of boss #1’s murder, likely because fewer features defined these persons (De Bonis et al., 1994). Since multiple levels within the self structure represent a more complex, integrated and psychologically ‘healthy self’ (Gara et al., 1989) it is noteworthy that the patient’s roles of ‘self’ became more integrated during recovery. HICLAS affords a visualization based on quantitative assessments of self-concept. Crucially it can be used as a tool with which to formulate a more complete picture of a patient’s social landscape, without requiring a full narrative statement. Here we present this approach as a tool with which it is possible to examine the relationship between delusions, self-concept, and therapeutic outcome. In summary, this quantification and cartography of the phenomenology of the critical role of ‘self’ in delusion formation provides a framework for an experimental neuropsychiatric study of the ‘self’ and its fundamental role in delusions.

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### Conflicts of Interest

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**Table 1**

| Persons | First assessment | Final assessment |
|---------|-----------------|-----------------|
|         | Goodness-of-fit | Bundle pattern  | Goodness-of-fit | Bundle pattern |
| Boss (#1) | 0.64 | 100 | 0.83 | 100 |
| Boss (#2) | 0.82 | 100 | 0.43 | 100 |
| Coworker (#1) | 0.69 | 100 | 0.33 | 100 |
| Coworker (#2) | 0.5 | 001 | 1 | 100 |
| Father | 0.67 | 001 | 1 | 100 |
| Friend | 0.89 | 100 | 0.5 | 100 |
| Me as daughter | 0 | 000 | 0.5 | 100 |
| Me as colleague | 0.71 | 010 | 1 | 001 |
| Me as friend | 0.83 | 010 | 0.5 | 100 |
| Me as I perceive | 0.63 | 010 | 0.33 | 100 |
| Me as professional | 0.67 | 010 | 1 | 001 |
| Me as sister | 0.5 | 010 | 0.5 | 100 |
| Mother | 1 | 001 | 0.5 | 100 |
| Nurse | 1 | 001 | 1 | 110 |
| Photographer | 0.67 | 100 | 0.75 | 001 |
| Psychiatrist | 1 | 001 | 1 | 110 |
| Researcher | 0.83 | 001 | 1 | 110 |
| Sister | 1 | 001 | 1 | 110 |

| Features | First assessment | Final assessment |
|---------|-----------------|-----------------|
|         | Goodness-of-fit | Bundle pattern  | Goodness-of-fit | Bundle pattern |
| Aggressive | 0 | 000 | 0 | 000 |
| Calculating | 0.5 | 100 | 0 | 000 |
| Capable | 0.5 | 001 | 1 | 010 |
| Compromising | 1 | 010 | 0 | 000 |
| Deceiving | 0.83 | 100 | 0 | 000 |
| Disingenuous | 0.71 | 100 | 0.71 | 001 |
| Excluding | 0.8 | 100 | 0 | 000 |
| Helpful | 0.86 | 001 | 0.67 | 010 |
| Gossiping | 0.92 | 010 | 0 | 000 |
| Hiding | 0.94 | 111 | 0 | 000 |
| something | Hostile | 0.6 | 100 | 0 | 000 |
| Investigative | 0.94 | 111 | 0.92 | 011 |
| Manipulative | 0.6 | 100 | 0 | 000 |
| Powerful | 0.5 | 001 | 0.8 | 010 |
| Trustworthy | 0.77 | 011 | 0.69 | 100 |
| Vengeful | 0 | 000 | 0 | 000 |
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