DID-TM: A Clinician's System for Visualizing Personality

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Abstract

The Dissociative Identity Disorder – Trait Mapper (DID-TM) is a system for use by clinicians and researchers in the treatment and study of dissociative disorders. In these disorders, individuals manifest multiple identities that must be understood and tracked through treatment. The system's visual representations assist the user in gaining insight into the structures of personalities, patterns of communication among personalities, and the process of personality change and integration as treatment progresses. The central visualization tools are derived from clinician defined traits displayed as parallel coordinate visual representations augmented by enhanced color display of individual traits. System facilities are also available for visual representation of communication patterns among the client's identities and storing clinical notes.

Keywords: Information visualization, parallel coordinates, personality

1. Introduction

Clinicians working with patients diagnosed with dissociative identity disorder (multiple personality disorder) deal with the problems of information overload common to other tasks. Challenges to the clinician are presented by the need to handle heavy caseloads and, for dissociative identity disorder clients, keep track of multiple personality states that change over time. Information visualization offers a promising methodology to augment traditional paper and pencil techniques for recording cases by supplying visual representation and tracking capabilities that allow the rapid intake, retrieval, and understanding of information.

The Dissociative Identity Disorder – Trait Mapper (DID-TM) system focuses on supplying tools and techniques for assisting clinicians in dealing with clients with dissociative identity disorder. Treatment of these patients is a challenging task in which the clinician must handle the complexity of several personalities, their evolving descriptions, dominances, communications, awareness of other personality states, extent of memory, and integration. The DID-TM suite of tools utilizes relatively well know information visualization techniques, e.g., parallel coordinates, as well as more novel techniques developed for this setting, to assist clinicians in accomplishing their goals.

1.1. Dissociative Identity Disorder

The manifestation of multiple personalities in a single individual was first reported over one hundred years ago [1, 2] and has received popular attention through the book *The Three Faces of Eve* [3] and the film based on it. The reclassification of multiple personality disorder in the DSM as a dissociative identity disorder and the linking of it with other stress related syndromes highlights the continuing and increasing impact of this disorder [4, 5].

Currently, therapy is carried out on an inpatient or outpatient clinical basis over long periods of time, with treatment sometimes extending over three to five years. Usually, therapy consists of a combination of psychodynamic/cognitive psychotherapy and hypnotherapy, which are used to stabilize and eventually integrate the personality states of a patient. Some estimates of occurrence rates are as high as 3% of all psychiatric disorders [6].

One of the primary diagnostic indicators of dissociative identity disorder that distinguishes it from other dissociative disorders is a fragmenting of the personality into several distinct alter states or "personalities". The similarity of these alter states can

vary, but they usually exist as relatively distinct entities in which the individual perceives and interacts with the environment and others. For example, during the historical case of Christine Beauchamp [7], it was discovered that the patient had three main alters. The clinician making the diagnosis noted several major ways in which these alters were different including tastes, habits, memories, and intellect. Not surprisingly, the data gathered from each alter quickly outstripped the clinician's ability to remember all the details. To combat this problem, the clinician making the diagnosis began augmenting his notes with illustrations, shown in Figure 1, of alter relationships and communication.

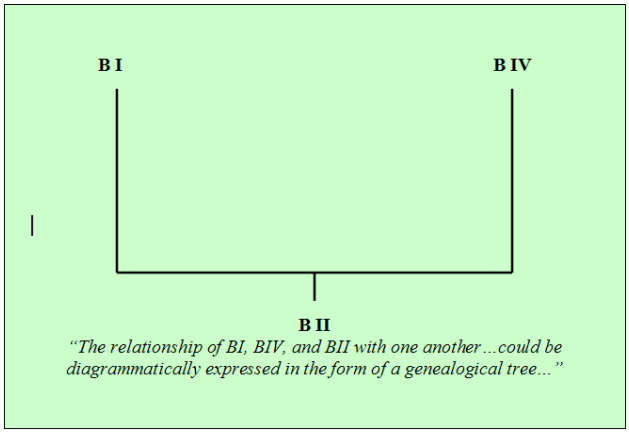

Figure 1. Clinician representation of alter relationships.

Because therapy starts with analyzing each alter state to understand its role in the client's functioning and the cause of dissociation, enhancing the clinician's ability to understand the specific nuances of each alter's personality would likely increase the pace of the clinician's understanding. This would in turn speed treatment planning and ultimately the rate of recovery.

However, despite the long history in analyzing dissociative identity disorder, handwritten and typed notes remain the primary means for gathering and recording information. Over years, these notes can grow to hundreds of pages. Although storing the text information electronically is an improvement, this only solves the problem of keeping and transferring the data. It does nothing to combat the information overload inherent in understanding the multiple personality states. This problem is worsened should the patient change doctors or have a lengthy pause occur in treatment, due to the significant startup time needed to understand the case and gain the depth of insight provided by previous therapy.

1.2. Visualization

Among the goals of computer based visualization in any system are the uses of visual representations to manage complexity and to gain insight into the phenomenon of interest, through the use of external aids. Significant successes in the past twenty years are evident both in scientific visualization, concerned with visual representations of physical phenomena [8], and information visualization, concerned with visual representation of abstract phenomena [9]. In the domain of information visualization, successes range from a) narrowly focused systems that augment standard electronic tools, e.g., Internet browsing, with Lamping and Rao's hyperbolic browser [10] and Hendley et al.'s 3D navigation tools [11], to b) visual systems supporting data mining [12, 13] to c) more general purpose systems that provide a suite of visualization mechanisms for abstract information, e.g., VisDB [14] and SDM [15].

Despite recent successes, the application of visualization techniques to human personality is relatively unexplored. This is in part due to both challenges inherent in information visualization and challenges unique to the description of personality. The creation of visual representations initially includes the mapping or transformation of the abstract phenomenon, here personality, to some quantitative metric or other visualizable representation. The display of the phenomenon is then possible through the derived representation [16]. Human personality provides a rich domain for exploration, because of its inherently amorphous information structure.

2. The Dissociative Identity Disorder – Trait Mapper (DID-TM) System

The Dissociative Identity Disorder – Trait Mapper (DID-TM) system provides facilities for clinicians and researchers dealing with dissociative identity disorder to 1) interactively create personality profiles for the multiple identities of the client, 2) create descriptions of communication patterns among identities, 3) provide visual representations of personality and communication to aid in gaining

insight to relations among identities, 4) manage and automate traditional text-based materials, and 5) facilitate understanding of change in the patient across time through both text and visual representations provided by the system.

The remainder of this section details DID-TM functionality, together with display and visualization techniques used by the system. Figure 2 below presents an overview of the system in use.

2.1. System Use and Displays

As shown in Figure 2, the Dissociative Identity Disorder - Trait Mapper (DID-TM) system provides a visually based display of case information. Visual representations of the individual's four alter personalities are displayed in the upper left window. For each personality, eight traits, e.g., stable-unstable, are displayed. Sliders are positioned by the clinician to qualitatively describe each personality for each trait. Slider positions are connected by lines to provide a visual profile for each personality. To the right of the display, the profiles are shown overlaid, providing a parallel coordinate display that visually highlights similarities and differences among personalities. This set of profiles forms the primary interface for the DID - TM system. The bottom right window provides an alternate display of personality profiles. Here the clinician is provided with alter state at a glance. The lower left window shows communication possibilities among personalities represented by link directionality and style, e.g., Eric can communicate and is aware of Kenny, but Kenny can not communicate with Eric. The upper right-windows show the text entry facilities. Notes are collapsed and opened by selecting a button associated with each alter personality trait from the main

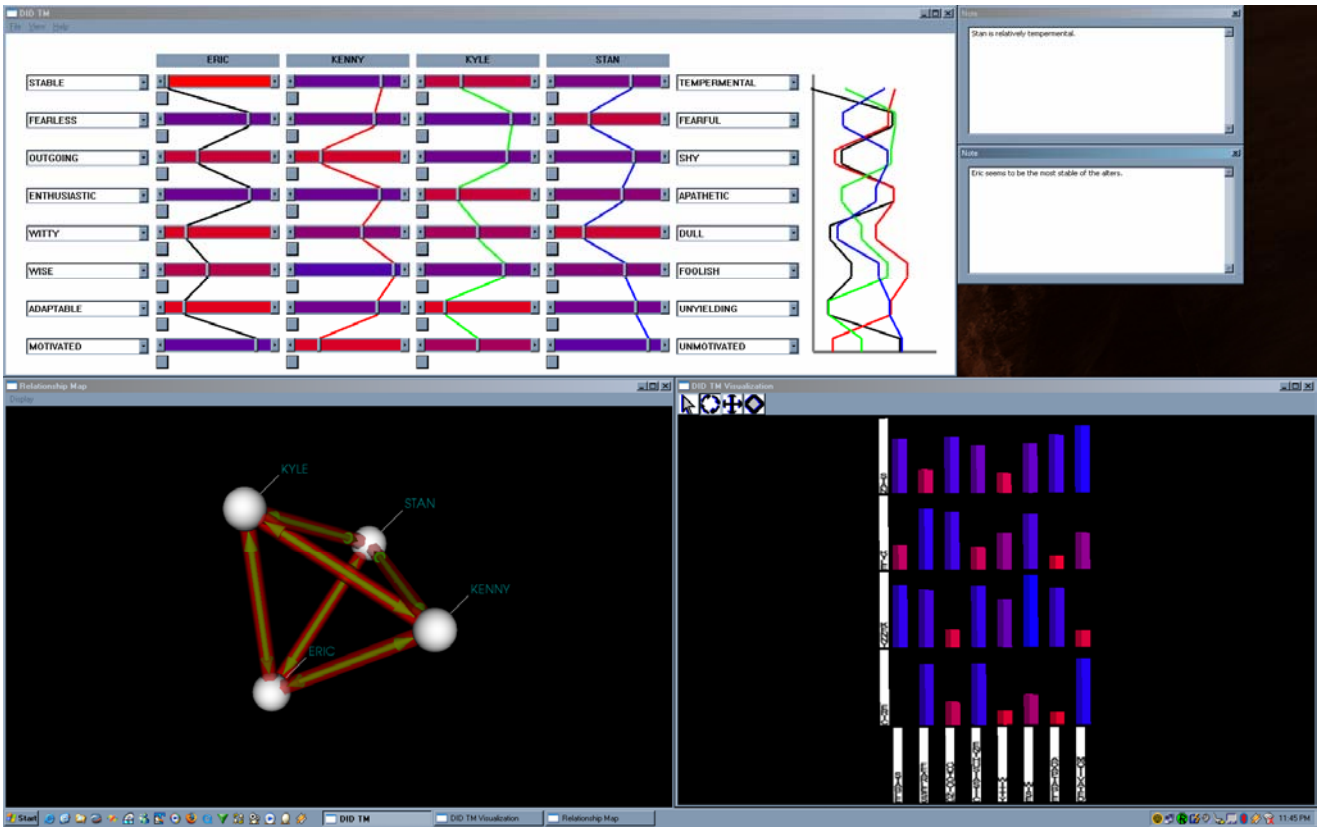

Figure 2. Case information displayed using the Disssociative Identity Disorder - Trait Mapper (DID-TM) system. Visual representations of the individual's four alter personalities are displayed in the upper left window as personality profiles. Overlaying profiles provides a parallel coordinate display visually highlighting similarities and differences among personalities. The lower right window provides an alternate display for personality profiles. The lower left window shows communication among personalities represented by link directionality and style. At the upper right of the screen are text windows opened for clinician's notes.

interface, or the clinician may select traits from the alternate traits display.

2.2. Personality Profiles and Visual Display as Parallel Coordinates

The efficient description of each of the patient's alter personalities and the tracking of the states of those personalities through the course of therapy are among the primary challenges to clinicians. Using a personality trait description, alters are described by a set of traits, e.g., dependent-independent, honest-dishonest, each represented as a scale. Because of the qualitative nature of these traits, it was hypothesized that absolute quantitative display of trait information would not be necessary. This hypothesis was validated by clinician preference to indicate the relative status of the traits among alters, rather than to indicate an absolute measure. In DID-TM the number of traits is also clinician defined. The system provides an initial set of traits found useful by clinicians, shown below in Figure 3. This initial set of traits was drawn from the domain literature and provided by clinicians involved in the system creation. The user can also define other traits as needed for each case. This flexibility allows the therapist to get started quickly and refine descriptions as the case progresses.

The use of personality traits as the principal mechanism to describe personality was a design choice that provided a compromise representation that is relatively easily created, manipulated, stored, and visually represented. The tradeoff is the inherent loss of information in using any quantitative measure of personality. To offset that loss, facilities are provided to allow the clinician to manually enter text notes providing additional information for any of the descriptors and for each alter.

As shown in Figure 2, for each of four alter personalities in the example, each trait, e.g., stable-temperamental, fearless-fearful, is described by the positioning of the slider associated in the interface with that trait. The color of the bar associated with a trait changes as the slider approaches each end of the scale in a style found meaningful by clinicians. The system also makes use of brushing in the at a glance trait display to aid the clinician in recognizing patterns in the displayed trait information. By connecting slider positions, a visual profile across the several traits is created for each alter personality. These

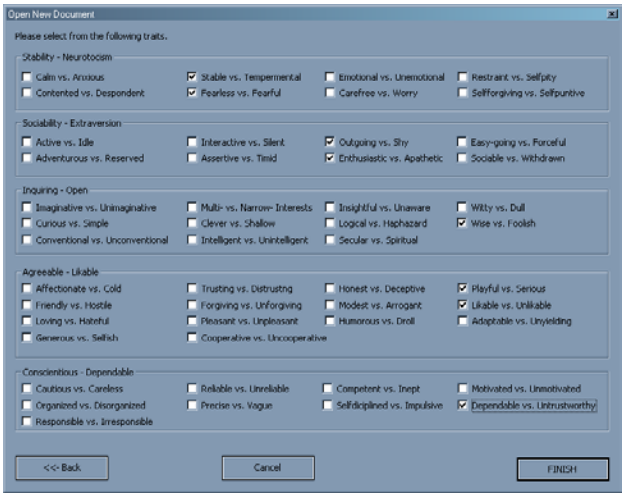

Figure 3: Initial set of personality traits provided by the system for clinician use. Additional traits can be defined.

visual profiles are displayed simultaneously and visual profiles are displayed simultaneously and supply the user with a representation that allows the rapid discernment of congruencies in the differences and similarities among personalities, as well as other more complex patterns of trait relationships. Profiles are also displayed overlaid in the same space, as shown at the top right of Figure 2, providing a parallel coordinate display [17, 18] that has proven particularly effective in multidimensional information display.

2.3. Communication Pattern and Style as Graph

A primary goal of therapy is the integration of the patient's alter personalities. Typically, communication and even awareness of one alter with another is restricted. Though some alter pairs may be able to communicate freely back and forth, others may have only one way communication or awareness, and others may be totally separate with no knowledge of the other. Additionally, communication has characteristic styles, such as dominant, deprecating, or yielding. As with personality traits, communication patterns and styles change over time.

The system provides visually displayed graph representations of communication, as shown in Figure 4. Alter personalities are represented as nodes in the graph, and communication pattern and style are reflected in the visual form of the links. Each path of communication is represented by presence of a link and its directionality by the arrow shown adjacent to

the node. Relative assessment of communication flow is reflected in the size of the link, and communication style is coded by the form of the link. In most cases, individuals have relatively few alter personalities, and graph display is reasonably straightforward. However, it is not uncommon to have many more personalities, or "sub" personalities. Primarily in order to effectively display these more complex relations, the system uses spring-based three dimensional graph layout and is effective to about ten personalities. Though this small number may seem somewhat limiting, clinician input has indicated that most patients with dissociative identity disorder experience fragmentation in the range of three to eight personalities, and this number is easily accommodated by the system.

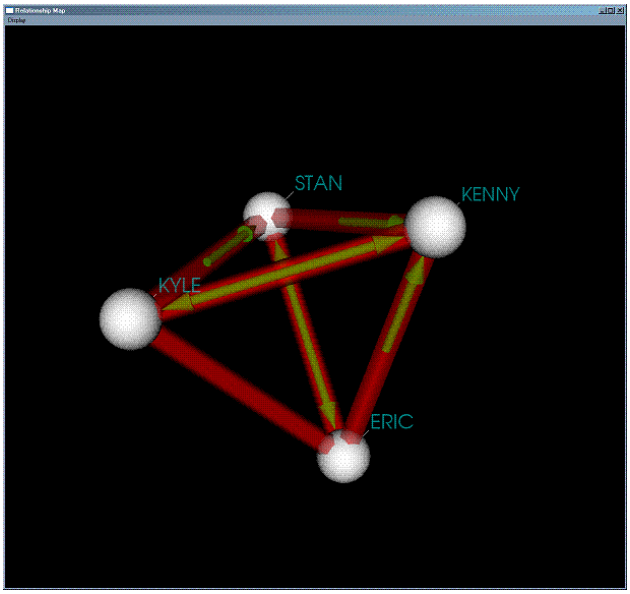

Figure 4. Communication among alter states represented as graph.

2.4. Managing Traditional Text based Materials

Though the visual representations provided by DID-TM are its most novel elements, the efficient management of a case's text based materials is at least as important in practice. Clinicians continue to take notes during therapy sessions, and the system's organization facilities allow those notes and other materials to be cataloged, indexed, and retrieved by individual case, alter personality, personality trait, session date or communication relationship.

2.5. Assessing Change through Treatment with Visual Representations

Given that treatment of dissociative identity disorder typically takes place over a period of years with dozens or hundreds of sessions, the tracking of patient's progress toward the integration of several personalities is a challenging task. An important contribution of DID-TM's visual representations is the ability to rapidly and efficiently display its abstracted personality representations across time.

Two types of time based visual representations are available. The first is derived from personality profiles. Users can select to display either the parallel coordinate view of personality traits, which presents all alter personality profiles simultaneously, or an individual alter personality trait profile across time. For example, the user might select a one week time interval for the parallel coordinate view, the system would then extract from its database the profile sets at the specified time interval and display each set successively to the user. Such successive displays are useful not only in capturing individual points of progress, but also patterns of change over time. The second type of time based visual representation uses the graph of communication pattern and style in a similar way.

3. Conclusions

The goal of the project is to create a system to aid therapists working with patients manifesting dissociative identity disorders in managing the complexity of information gathered during therapy. After this complexity has been offloaded to the system, it is hoped that gains in insight and efficiency in treatment through the system's visual representations and text-based facilities will be possible. The authors recently had the opportunity to conduct a workshop on using DID-TM with practitioners at the annual meeting of the International Society for the Study of Dissociation. Feedback from the workshop indicated that the system has at this time achieved many of its initial goals. Presently, we continue to refine the system based on practitioner feedback and look forward to making the system available in the near future.

4. Future Work

Though our initial results with the system have been encouraging, an extended usability test of the system would demonstrate its effectiveness. Initially, these tests should not include use in an actual clinical setting but would draw from historical case data. After its effectiveness is demonstrated in this arena, small and eventually large scale clinical trials would take place to further refine the system from use in the intended system environment.

5. Acknowledgements

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