Tagging Psychotherapeutic Interviews for Linguistic Analysis

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Abstract

A proposal is presented to create a tagset for linguistic features that constitute the meaningful elements to one particular theory of psychotherapeutic intervention, that is Grinder & Bandler's Metamodel. These features include lexical, lexicogrammatical and semantic phenomena. It is proposed that determining the effectiveness of therapy could in some degree be automated by building an information system to automatically tag client interviews. An appraisal of the effectiveness of the computational processing, as well as the therapy, might be established by comparing some characterisation of client interviews before and after therapy based on the features of the Metamodel. Three 30 minute interviews for each of 10 clients are available, that is before and after group therapy sessions and 3-6 months later. The prototype tagset is presented for appraisal. A hand analysis of some of the data gives prima facie justification for persuing this research.

The appraisal of the effectiveness of psychotherapy has proven to be extremely difficult. Both process and outcome studies have provided incomplete evidence as to the effectiveness of therapy (Lambert & Hill, 1994). A recent review of the field states that not one out of hundreds of methods has been shown to be more effective than any other method, this includes the failure of psychotropic methods to be any better than "talk" therapies (Miller, Hubble, Duncan, 1995). This does not mean that therapy is not effective as it has been convincingly shown to be more effective than placebo and control groups. However the effectiveness of therapy has been asserted to be most highly correlated with four contributory factors; psyhcotherapeutic method 15%, therapeutic relationship 30%, client situation 40%, client expectancy 15%(Miller, Hubble, Duncan, 1995). With this backdrop it can be seen that any method that can contribute to understanding and assessing the nature of change in a client will benefit not only the psychotherapy profession as a whole, but other professions with outcomes that require learning by their clients.

There are a great number of psychotherapy methods that dominantly require extensive conversational intercourse between therapist and client. Perhaps the most popularly known are psychodynamic, Cognitive Behavioural Therapy(CBT), and interpersonal therapies such as family therapy, narrative therapy, emotion-focussed therapy, solution-focussed therapy. Many of these therapies have developed a demand for linguistic analysis but with their strongest attention on the therapist's rhetoric and discourses. Their claims about client language fall more into the level of genre and ideology, that is the focus of the therapy is on varied aspects of the content not the lexicogrammatical structure of the language. The only method that has focussed dominantly on language structure has become known as Neurolinguistic Programming. It was originally proffered not as a therapy method but as a method of language analysis, called the Metamodel, suitable for use by practitioners of any therapeutic method. However with enhancements beyond its linguistic principles, it soon

became promoted as a method of therapy by its supporters. In that light Neurolinguistic Programming has to be viewed as different to other conversational therapies. It is not aligned with social constructivist models of realities that represent therapy as challenging and reworking socially constructed phenomena, and which are therefore computationally difficult to evaluate. Rather it asserts an Intrapsychic focus where change is in the mind (and body) of the client and so has more potential for computational processing.

The Metamodel method argues that humans have three principal mechanisms that are necessary for filtering information from the external world. They are generalization, deletion and distortion, from which people construct their model of the world. In communicating with each other, humans project their model of the world, hence any impoverishment in this model will be produced in their language. In the circumstances where people are suffering emotional pain brought about by limitations in their model, and therefore their sense of not having choices of action, a search of their language structures should show evidence of generalization, distortion and deletion, indicating the impoverished components of the model. The process of psychotherapeutic change then begins with detecting the impoverishments and then assisting the client to recognise and then recover the missing pieces. This places the client in the position of active self-discovery, expanding themselves by actively expanding their model of the world (Bandler & Grinder, 1975).

The Metamodel method is claimed to have the characteristics of, firstly, specifying a process for moving from the surface structure of an utterance to its full semantic content, secondly, it provides the therapist with an accurate view of the client's model of the relevant part of the world, and thirdly, it provides a format for challenging the full semantic structure of an utterance and reconnecting it with direct personal experience. These characteristics of the Metamodel mean that the therapist can challenge the client's assumptions that their linguistic model is reality, which is a major part of the therapeutic process.

The linguistic classes that are explicitly listed for use by the Metamodel are the following:
Generalization - generalized referential index, non-specific nouns, non-specific verbs, universal quantifiers,
Distortion - reversed referential index, nominalisations, some adverbial constructions (obviously, clearly, surprisingly)
Deletion - deleted referential index, non-specific referent, comparatives and superlatives with missing referents, modal operators of possibility and necessity, missing information, presuppositions, semiotic distance (use of passive voice)
Semantic ill-formedness - cause & effect, implied causatives, mind reading, lost performatives and complex equivalences.

Other linguistic classes were added with the development of the idea of *Representational Systems*, that is, a biased use of sensory specific words of the visual, auditory, kinaesthetic, olfactory and gustatory classes (Grinder & Bandler, 1976)

These classes are lexical, lexicogrammatical and semantic. We are interested in processing text to identify and tag each of these phenomena. A set of tagged examples covering these linguistic classes is presented in Appendix 1 and a prototype tagset is presented in Appendix 2. The proposed tagset at this stage attempts to capture the requirements of the Metamodel at a macro level. It is accepted that this set will be subject to change and refinement as a better understanding of both the linguistic and computational problems emerge, and in particular the linguistic theory is updated to include more contemporary knowledge.

The Metamodel method has the concept of statements that are "well-formed in therapy" with seven criteria for assessment, which might also be used as criteria for characterizing client dialogues. They are:
- well-formed in english
- contain no transformational deletions or unexplored deletions of areas of the model in which the client experiences no choices.
- contains no nominalisations
- contain no words or phrases lacking referential indices
- contain no verbs incompletely specified
- contain no unexplored presuppositions in the portion of the model in which the client experiences no choice
- contain no sentences which violate the semantic conditions of well-formedness.

For the purposes of assessing the value of a psychotherapy program, it is conceivable that the change in linguistic usage by a client represents the effectiveness of the psychotherapeutic process. If such a postulate is accepted then the analysis of the comparison of conversational speech of the client before therapy and after therapy would be an appropriate measure of therapeutic effectiveness.

In our case we have 10 clients with 30 minute interviews recorded before therapy, after therapy and 3-6 months downstream of therapy totalling 15 hours of transcripts. We intend to develop automated processing methods to identify the linguistic classes described by the Metamodel, construct a characterisation of each interview and test for a change in language usage by the clients. A collation of a few classes of representational system data performed by hand gave some encouragement that this approach is useful. It showed that 7 out of 10 clients had a significant change in their language towards the desirable direction, that is greater diversity. Two showed no change and one showed retrograde change, that is narrower diversity. These results were consistent with the therapist's observations about the progress of the clients in their therapeutic program.

References

Bandler, R. & Grinder, J. (1975). *The Structure of Magic*. Palo Alto: Science and Behavior Books.

Grinder, J. & Bandler, R., (1976). *The Structure of Magic II*. Palo Alto: Science and Behavior Books

Lambert, M. J., & Hill, C. E. (1994). Assessing psychotherapy outcomes and processes. In A.E. Bergin & S. L. Garfield (Eds.) *Handbook of Psychotherapy and Behaviour Change*, (4th ed.), pp 72-113. New York: John Wiley & Sons.

Miller, S. Hubble, M. Duncan, B. (1995). "No More Bells and Whistles". Networker, March/April, pp 53-63.

Appendix 1 - A set of tagged examples for G&B Metamodel's linguistic classes

GENERALISATION

Generalised Referential Index - Something that is specified by a general term.

one, it, those, that, they

<gri_cla><gri_sub>One</gri_sub> who <gri_vrb>loves</gri_vrb></gri_cla>

<gri_cla><gri_sub>They</gri_sub> <gri_vrb>are</gri_vrb> dangerous</gri_cla>

Non-specific Nouns - A class of objects rather than a specific object.

child, person, thing

<nspn_cla><nspn>A person</nspn> <nspn_rel_cl>who is angry<nspn_rel_cl></
nspn_cla>

Non-specific Verbs - A class of actions without specific behavioural information.

hurt, feel, communicate

<nspv_cl>I have difficulty <nspv>communicating</nspv></nspv_cl>

Universal Quantifiers - A categorical generalization.

all, each, every, everything, any, always, everytime, never, none, nowhere, no one, nobody, nothing

<uq_cl><uq_obj>All</uq_obj> <uq_sub>generalisations</uq_sub> are wrong</uq_cl>

<uq_cl><uq_tme>Everytime</uq_tme> I come home you pick on me</uq_cl>

DISTORTION

Reversed Referential Index - The speaker is declared as the receiver rather than the doer of the action.

<rri_cl><rri>nobody</rri> loves me</rri_cl>

<rri_cl><rri>everyone</rri> hates me</rri_cl>

Nominalisations - Actions or processes are made into an object.

relationship, education, confusion, love, respect, anger, communication

<nom_cl>I am uncomfortable with <nom>anger</nom></nom_cl>

DELETION

Deleted Referential Index - A referent is omitted.

<dri_cl>I'm not loved<dri_sub></dri_sub></dri_cl>

<dri_cl>My father was angry<dri_obj></dri_obj></dri_cl>

<dri_cl>I don't know what to say<dri_ind></dri_ind></dri_cl>

Non-specific Referent - A referent is vague or non-specific.

<nspri_cl>I'm angry about <nspri>this</nspri></nspri_cl>

Comparisons - A missing term in a comparison.

Comparatives -

<mcomp_cl>She's better<mcomp_obj></mcomp_obj></mcomp_cl>
<mcomp_cl>It is better to be quiet<mcomp_pro></mcomp_pro></mcomp_cl>
Superlatives -
<msup_cl>He's the worst <msup_obj></msup_obj></msup_cl>
<msup_cl>Anger is the worst feeling<msup_pro><msup_pro></msup_cl>

Modal operators -mop - Rules or limits to behaviour.
Possibility -mop_pos - can't, won't, may, might, could, would
<mop_pos_cl>It is <mop_pos>impossible</mop_pos> to be angry with
him<mop_pos_cl>
Necessity - mop_nec - have to, should, must
<mop_nec_cl>I <mop_nec>shouldn't<mop_nec>be angry</mop_nec_cl>

SEMANTIC ILL-FORMEDNESS
Cause & Effect - ce - A cause-effect link between two things that are not intrinsically linked in
that way.
<ce_cl><ce_ind>You make me</ce_ind> feel bored</ce_cl>
<ce_cl><ce_ind>She makes me</ce_ind> angry</ce_cl>

Implied Causative - icau - One statement is the implied cause of another: often uses "but".
<icau_cl><icau_cau>I want to leave home</icau_cau> but <icau_eff>my father is sick</
icau_eff></icau_cl>

Mind Reading - mr - Claiming to know someone else's internal experience.
Reading others - mr_oth
<mr_oth_cl>He never <mr_oth_proc>considers</mr_oth_pro> my feelings</mr_oth_cl>
<mr_oth_cl>She is unhappy</mr_oth_cl>
<mr_oth_cl>I know how he feels</mr_oth_cl>
Being read by others - mr_by_oth
<mr_by_oth_cl>Can you <mr_by_oth_proc>see</mr_by_oth_proc>how I feel </
mr_by_oth_cl>
<mr_by_oth_cl>You should <mr_by_oth_proc>know</mr_by_oth_proc> that upsets
me</mr_by_oth_cl>

Lost Performative/Judgements - lp - A value judgement that omits who and how it was arrived
at.
<lp_cl>You should be consistent</lp_cl>
<lp_cl>That's a good thing for you to do</lp_cl>
<lp_cl>It is bad to be angry</lp_cl>
Clearly & obviously
<lp_co_cl>Clearly, that sort of behaviour is unacceptable</lp_co_cl>

Complex Equivalence - cequ - Two different expressions are declared to be equivalent.
<cequ_cl>My husband never appreciates me... he never smiles at me</cequ_cl>
<cequ_cl>When she narrows her eyes and leans forward I know she is unhappy with me</
cequ_cl>
<cequ_cl>He hates me, he is always angry</cequ_cl>

Appendix 2 - Prototype Tagset for the G&B Metamodel

GENERALISATION

Generalised Referential Index - gri

\<gri_sub\>	referential index that is of a generalised form
\<gri_cla\>	a clause which contains a gri
\<gri_vrb\>	the verb to which the gri is related

Non-specific Nouns - nspn

\<nspn\>	a noun that doesn't specifically instantiate the object of discussion
\<nspn_cla\>	a clause containing the nspn
\<nspn_rel_cl\>	a relative clause governed by the nspn

Non-specific Verbs - nspv

\<nspv\>	a verb which doesn't contain specific behavioural information
\<nspv_cl\>	a clause that contains a nspv

Universal Quantifiers - uq

\<uq_obj\>	a universal quantifier that refers to an object
\<uq_obj_cl\>	a clause that contains a uq_obj
\<uq_obj_sub\>	the subject referred to by the uq_obj
\<uq_tme\>	a universal quantifier that refers to time
\<uq_tme_cl\>	a clause that contains a uq_tme

DISTORTION

Reversed Referential Index - rri

\<rri\>	the object that is placed as the doer of the action
\<rri_cl\>	a clause that contains a rri

Nominalisation - nom

\<nom\>	an object that can be converted into a process
\<nom_cl\>	a clause that contains a nom

DELETION

Deleted Referential Index - dri

\<dri_sub\>	a location where a nominative referent is missing in the clause
\<dri_obj\>	a location where an accusative referent is missing in the clause
\<dri_ind\>	a location where an indirect referent is missing in the clause
\<dri_cl\>	a clause that contains a dri

Non-specific Referent - nspri

\<nspri\>	a referential index that is vague or non-specific
\<nspri_cl\>	a clause that contains a nspri

Comparisons - mcomp.

Comparatives - mcomp

\<mcomp_obj>	a location where an object in the superlative is missing
\<mcomp_pro>	a location where a process in the superlative is missing
\<mcomp_cl>	a clause that contains an mcomp

Superlatives - msup

\<msup_obj>	a location where a term in the superlative is missing
\<msup_cl>	a clause that contains an msup

Modal operators -mop
Possibility -mop_pos

\<mop_pos>	a modal operator of possibility
\<mop_pos_cl>	a clause that contains an mop_pos

Necessity - mop_nec

\<mop_nec>	a modal operator of necessity
\<mop_nec_cl>	a clause that contains an mop_nec

SEMANTIC ILL-FORMEDNESS

Cause & Effect - ce

\<ce_ind>	the referents implicated in the cause
\<ce_cl>	a clause that contains a ce_ind

Implied Causative - ic

\<icau_cau>	the cause in the implied causative
\<icau_eff>	the effect in the implied causative
\<icau_cl>	a clause that contains an icau

Mind Reading - mr
Reading others - mr_oth

\<mr_oth_proc>	a process and referents implicated in reading others minds
\<mr_oth_cl>	a clause that contains an mr_oth

Being read by others - mr_by_oth

\<mr_by_oth_proc>	a process and referents implicated in having one's mind read by others
\<mr_by_oth_cl>	a clause that contains an mr_by_oth

Lost Performative/Judgements - lp

\<lp_cl>	a clause that contains a lost performative statement

Clearly & obviously

\<lp_co_cl>	a clause that contains a lost performative statement containing "clearly" or "obviously"

Complex Equivalence - cequ

\<cequ_cl>	a clause that asserts two expressions are equivalent when they not on psychotherapeutic grounds