Assessing Perspective-Taking in Texts: Inspirations for Analytical Targets from Socio-Cognitive Narrative Coding Schemes

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Abstract

Inferring interpersonal processes such as perspective-taking and empathy from text is a valuable yet not widely developed tool to study inter-individual differences in social interaction. Going beyond lexical categorization, more pragmatically oriented classification procedures can profit from insights from traditional qualitative tools in social-cognitive research, especially narrative coding. In this short paper, I briefly discuss the concept of perspective-taking and its points of contact with language. I then illustrate a specific narrative coding system (Feffer's decentring scales) and make suggestions as to how this system offers targets for automatized classification procedures, offering impulses for the integration of natural language processing and research into social interaction.

Language and Interpersonal Processes

Human language plays a significant role in interpersonal interaction. It is therefore not surprising that language is closely intertwined with interpersonal processes, with parallel developmental trajectories (Garfield et al. 2001), reciprocal influence on each other in behaviour (Mass et al. 2016) and correlated impairments between the two in some neuropsychiatric disorders (Cummings 2021). Despite this close link, there has been only relatively little research (beyond developmental research) on how inter-individual differences in interpersonal processes are manifested in language, how specific linguistic patterns relate to these social-cognitive processes and how linguistic and social cues are integrated in this domain (Holtgraves and Kashima 2007).

Among the most relevant interpersonal processes typically present in social interaction is the ability to understand cognitive mental states (such as beliefs and intentions) as well as affective mental states (such as emotions or pain). Humans differ to some extent in their ability to use these processes, but even more so, situational and interactional features determine to what extent mental states of others are assessed and evaluated in a given situation. Hence, it is highly relevant for social cognition research to assess both the ability and the propensity to use these processes (given a particular situational cue) and to understand in more detail which factors determine them. In this regard, developing more systematic (and automatic) classification procedures for perspective-taking (and empathy) based on language is therefore highly relevant and should also take into account insights from previous linguistic and social-psychological work that provide avenues for future research.

Links between empathy, perspective-taking and language are particularly visible in the context of pronoun use and referential structure (i.e., keeping track of referents in discourse and managing common ground with an interlocutor). For instance, self-reported empathy correlates positively with the number of pronouns and words of social reference used in blogs (Litvak et al. 2016; Yaden et al. 2023). Also, empathic individuals react more sensitively to referential organizing principles such as topic continuity and person hierarchies (Kann et al. 2023) but also to mismatches of social cues during language processing, e.g., social identity (van den Brink et al., 2012) or emotion expressions (Dozolme et al. 2015; Rak et al. 2009). Also, clinical populations with interpersonal impairments (esp. autism and schizophrenia) often exhibit linguistic difficulties – particularly in the referential structure (Hinzen 2022; Schroeder et al. 2023).

Besides linguistically informed analyses, a number of text-based narrative coding systems were developed in the past to assess interpersonal processes, among others, Teglasis's empathy score (Teglasi et al. 2008) and Feffer's decentring score (FDS; Feffer 1959). Both procedures focus on an evaluation of interactions between two discourse referents in narratives, thereby drawing on more general semanto-pragmatic aspects that are harder to capture with traditional linguistic analyses and harder to implement in automatic procedures. Nonetheless, some aspects of these narrative coding systems can inform automatic classification procedures. Pointing out some of these aspects is the goal of this short discussion article. In this contribution, I focus primarily on perspective-taking and outline aspects of FDS that might inform future implementations of automatic perspective-taking classification tools. Note, however, that I do not discuss technical specifications in the present contribution

but only offer suggestions for future work. I start by briefly discussing the concept of perspective-taking. I then illustrate how perspective-taking was assessed from text in the past. Ultimately, I discuss FDS as one specific procedure and emphasize components that might inform automatized classification procedures of perspective-taking from written text.

The Concept of Perspective-Taking

Perspective-taking, the degree to which a person is able or willing to consider mental states (intentions, beliefs, emotions) of another person, is an important interpersonal process and a central feature of social cognition. An important question under debate is whether perspective-taking is the same as cognitive empathy. Many authors simply equal these two terms (e.g., Duan and Hill 1996) but others argue that perspective-taking is just one route for achieving cognitive empathy, next to drawing inferences from facial expressions (e.g., Besel and Yuille 2010) or by projecting oneself in the position of the other person (e.g., Preston 2007). This latter process is sometimes described as "imagining how one would think and feel in the other's place" (Batson 2011: 7) and sometimes also called perspective-taking (Batson 2011; on this debate, see also Cuff et al. 2016; Stietz et al. 2019).

While both concepts are often broadly described as the ability to "put oneself in the shoes of another person" (Batson 2011), I cannot elaborate on this question here and simply focus on perspective-taking in a narrower sense, namely as the process of "imagining how another is thinking and feeling" (Batson 2011: 7) by forming representations of another person's internal states. That is, the focus is on the cognitive process of capturing mental states of another person (a process also called mentalizing; Frith and Frith 2006).

Similarly, the concept of theory of mind (ToM; originally developed in primate research, Premack and Woodruf 1978; and later adapted to describe the ability to "explain people's behaviour on the basis of their minds: their knowledge, their beliefs and their desires", Frith and Frith 2005: R644) is often used synonymously in this context but typically puts more emphasis on the content of the mental representation. Hence, I consider ToM as describing the ability to represent mental states of others (Frith and Frith 2005; Premack and Woodruff 1978) and perspective-taking as the propensity to apply these processes routinely in a specific social situation.

Relevant for the present discussion is also a particular concept brought forward by Feffer (1959). Feffer adopted Piaget's (1932, 1947) concept of decentring and applied it to the social domain. Feffer et al. (2008: 150) later describe social decentring as the ability of a person "to view her or his planned behaviour from the point of view of another person who may be affected by the action". This focus on alternating perspectives to and away from different people closely matches perspective-taking as the general propensity to grasp another person's internal states and imagine how another person is thinking or feeling, as outlined above. It is important to note here that Feffer et al. (2008) do not distinguish between the representation of another person's cognitive and emotional states – therefore laying the focus on the cognitive process of taking perspectives and attributing internalizations – irrespective of whether the internal state is a belief, intention, or emotion. Capturing this process based on written text is an interesting tool to assess socio-cognitive aspects of individuals and to identify linguistic markers of how humans represent others in their own mental states.

Assessing Perspective-Taking in Text

Looking at the language people use while drawing on interpersonal processes is an interesting procedure that also overcomes some limitations of questionnaire-based assessments of these processes. The assessment can be based on naturally occurring text (emails, social media content, e.g., Yaden et al. 2023) or text material elicited in a controlled manner (see below). An advantage of analysing written text, in comparison to observing behaviour or self-reports, is that it constitutes a more implicit measure that bypasses social desirability to some extent. Also, while behavioural tasks are often interpreted as performance tests by participants, the same is not true for writing. Text-based procedures are therefore well-equipped to assess the regular drawing on interpersonal processes – keeping situational cues relatively controlled.

Text material may then be assessed either by inspecting formal means of language (word frequencies, narrative structure etc.) or by using narrative content coding. One of the most widely used lexical classification tools in social psychology is Language Inquiry and Word Count (LIWC; Pennebaker et al. 2001). LIWC is relatively simple and classifies (and counts) occurring words in a text based on a number of pre-defined word categories ("dictionaries"), either based on linguistic features (e.g., pronouns) or psychological or semantic dimensions (e.g., *to see* and *to touch* being classified in the category SENSES) – allowing a rapid assessment of broad language-related features for a number of psychological processes (Tausczik and Pennebaker 2010).

Social processes can be classified with LIWC by looking into the number of words that refer to others (especially 3rd person pronouns) and those that are associated with the social domain (such as *friend*, *family*, *to meet*; see Pennebaker et al. 2004). Also, these LIWC categories are also correlated with the implicit need for affiliation (Schultheiss 2013).

Another approach is narrative coding, that is, the manual assessment of text based on pre-defined coding principles. For instance, Teglasi et al. (2008)'s empathy score captures three dimensions of empathic responding between two referents in a given discourse. In contrast, FDS focusses more strongly on the process of taking perspective by capturing

the depth of this process based on a single scale (for details, see below). Importantly, both procedures were not developed to assess a given interaction between two people but rather to assess narratives about two or more discourse referents written by a person (based on a previous story or image). That is, these narrative coding systems focus specifically on the question how observed interactions are perceived and represented by a person, thereby laying emphasis on social representation processes rather than interpersonal behaviour. This is also evident in how interpersonal decentring is conceptualized, namely as "an aspect of operational thinking that involves an ability to be aware of, respond to, and anticipate another person's ideas, thoughts, feelings, or actions" (Feffer et al. 2008). In the following, I illustrate how this conceptualization is implemented FDS.

Feffer's Decentring Scales (FDS)

FDS is a narrative coding system for perspective-taking that attempts to capture the extent to which subjects describe social interactions and attribute internal or mental states to discourse referents depicted in brief narratives (Feffer 1959; Feffer et al. 2008). Traditionally, text material for FDS was typically elicited with the Thematic Apperception Task (Murray 1943) or its derivate, the Picture Story Exercise (McClelland et al. 1989; Pang and Schultheiss 2005; Schultheiss and Pang 2007). In this task, participants see images with socially ambiguous scenes and differing levels of interaction and are then asked to write a story based on the image. The basic setup (and code examples) is given in Figure 1.

(Manual) Coding Rules

Coding Feffer's scores takes place in two steps. First, text material is screened for social interaction units (SIUs) by assessing whether there are (explicitly mentioned) overt interactions between two or more people present in the event description (for instance, the example code 2 in Figure 1) or whether interactions are present in form of internal processes of the people involved (Code 7 and 9 in Figure 1).

In a second step, each social interaction unit receives a score ranging from 1 to 9 (or 0 in the absence of any interaction). Pre-internalization processes (i.e., one-dimensional and sequential interactions without internalization or mentalizing processes such as "She watches the guitar player"; score: 2) receive scores from 1 to 4. In contrast, internalization processes (5 to 9) reflect multidimensional incorporations of thoughts and feelings of another person into the thoughts and feelings of a person. For instance, internalized states of another person (such as "As James knows how fascinated Georgia is by live music.") receive a scoring of 7 whereas internalized self-other processes ("He knows that he will love her forever.") are scored with a score of 9 (further details are described in depth in Feffer et al. 2008).

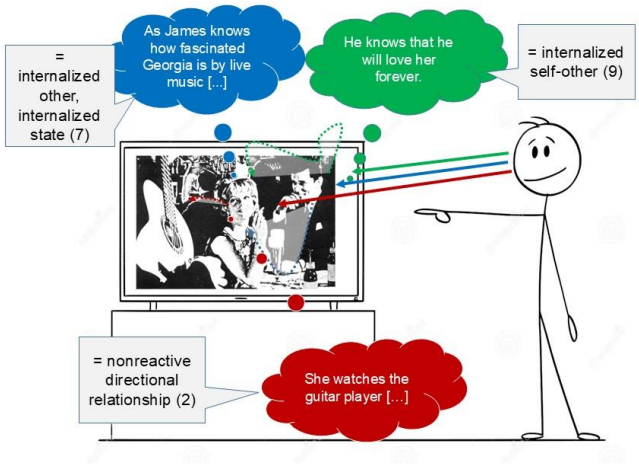

Figure 1: Illustration of Feffer's Decentring Scales.

In theory, the scores are ordinal scales but are commonly treated as interval scales for averaging and statistical analyses. Composite scores are calculated in different ways, either by simply averaging all scores within and across stories. Alternative suggestions were made to only use the single maximum score of a person or to only average the maximum scores of each story per person (see Feffer et al. 2008).

Training coders is relatively simple given the simplicity of the procedure and interrater reliabilities are typically very high (for instance, my research assistants achieved r = .944*** or κ = .824, 95% CI .782 - .865 in 120 stories).

Relation to Other Measures from Pilot Work

In a recent study (n = 239), we compared FDS with the two aforementioned LIWC categories (Compensis and Schultheiss in prep). FDS was significantly correlated (r = .28***) with the number of pronouns referring to others and with social words (r = .21**). Interestingly, however, FDS was confounded with word count (r = .35**), while pronouns referring to others (r = .12) and social words (r = -.02) were not. In another study (n = 168), FDS was positively correlated (r = .57**) with the need for power, an implicit motive that is characterized by a strong social component (Beuermann et al. in prep). To clarify further FDS's relation to other socio-cognitive and affective dimensions, we currently conduct a study in which we relate FDS to standard measures, among others, the Interpersonal Reactivity Index (Davis 1983) and the Reading the Mind in the Eyes Task (Baron-Cohen et al. 2001).

Suggestions for an Implementation of FDS

FDS is a relatively straight-forward and simple way to assess basic perspective-taking skills in narratives and can be

applied to all kinds of texts in which people mention and talk about other people, especially when interactions between two or more people are described or when one person is thinking about other people and attributes internal states to them. While the specific coding scale in its full form is probably restricted to its application in the context of narratives elicited from particular stimuli (image descriptions or retelling of stories), some main aspects of the coding procedure can inform more general assessments of perspective-taking based on text – as long as the text captures at least some dimension of social interaction of discourse referents. In the following, I briefly emphasize some aspects of FDS that can be used as a basis for developing more refined (and automatic) classification tools of this interpersonal process.

Identifying Social Interaction Unis (SIUs)

As was described above, the central level of analysis are social interaction units, that is, parts of the text in which discourse referents interact with each other (thereby fully excluding those parts of the discourse that simply describe the scene or surroundings or non-interactional behaviour of referents). Within FDS, SIUs are typically identified by changes in character, place or time. Recognizing these turns is based on a subjective assessment of the overall scene but could be approximated by mapping the referential structure (especially in terms of activation of discourse referents) and the event structure itself (by identifying transitivity).

Capturing the presence of discourse referents and closely tracking referential persistence and referential shifts are most likely the strongest indicators. Since discourse referents are typically introduced with their full names (“James”) or via indefinite nominal phrases (“a friend of mine”) and then referred to further depending on their activation in discourse (that is, with definite reference or, at the highest level of activation, by personal pronouns) and since referential shifts are often indicated again by indefinite reference (of a new referent) or by using demonstrative pronouns (Ariel 1990), it is relatively simple to model referential structure as a first proxy to capture the presence of social interactions.

To model interactional relationships further, verbal associations between referents could be classified based on transitivity to identify directional interactions (for contexts such as “she sees him”) and by assessing psychological and functional aspects of the verbs in order to identify the use of higher-ordered processes (e.g., psych verbs such as “he loves her”). In this context, capturing recursivity could additionally dissociate between mid and high-level perspective-taking according to FDS (e.g., psych verbs embedded in matrix clauses such as “he knows he loves her” representing higher degrees of perspective-taking according to Feffer et al. 2008). Obviously, approximating social interaction via referential structure could also be enhanced further by applying sophisticated dependency parsing to the texts.

Lexical Frequencies within SIUs

A complementary solution to map perspective-taking in texts inspired by FDS is to apply a lexical approach (that is, measuring word frequencies and identifying relevant categories in terms of functional or semantic aspects, similar to LIWC). It would be particularly fruitful to apply this approach to text within SIUs (and contrast it with text outside SIUs). Also, given an adequate dataset, one could apply lexical and also factorial analyses to SIUs of a particular level, for instance, to identify lexical markers that are specific for this level or to distinguish directional interaction from internalized representations characteristic of higher levels.

Again, there is a strong intuition that psych verbs but also pronouns feature more prominently within SIUs but the correlation of FDS with LIWC’s social category also hints at the presence of other relevant categories. Clearly, assessing lexical content for each level separately would provide a first step to identify reliable lexical markers that could then be compared to alternative approaches (such as LIWC) and be related to other socio-cognitive and affective measures – in order to inform classification mechanisms of perspective-taking based on lexical features and dependency parsing.

Conclusion

Extracting information on inter-individual differences and situational determinants of interpersonal processes (such as perspective-taking and empathy) based on texts is a valuable tool with manifold applications in the area of social psychology, affective computing as well as clinical and therapeutic contexts. Therefore, developing classification tools based on characteristic features is important and should also take into account insights from previous work on social cognition.

To offer some inspiration, I presented a traditional narrative-coding procedure from social-cognitive research (Feffer’s Decentring Scale) in this short contribution and illustrated how FDS is used to assess the interpersonal process of perspective-taking (i.e., the propensity to grasp another person’s internal states and imagine how another person is thinking or feeling) based on coding text. FDS captures the representational side of these processes and therefore can inform automatic classification procedures of perspective-taking in text, especially by suggesting analytical targets that could be the focus of these classification tools. Future research should therefore assess further how FDS relates externally to other socio-cognitive and socio-affective aspects and specify internally which linguistic features are characteristic of capturing perspective-taking as an interpersonal process. This contribution offers first rough points of contact for an automatic implementation based on insights from narrative coding and contributes to the integration of natural language processing and social interaction research.

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