

The role of stereotypes in irony comprehension in autism spectrum disorders

Scientific Report – Second Visit (8-15/04/2011)/Paris

1. Purpose of the visit

In this project, we investigate the interaction between social stereotypes and irony comprehension in individuals with autism spectrum disorders (ASD). Studies dedicated to social stereotypical categorization and irony perception in normal subjects demonstrated that speaker's gender (Link and Kreuz 2005; Colston and Lee 2010), and social stereotypes (Pexman and Olineck 2002; Pexman et al. 2010) are highly influential social constraints significantly influencing the comprehension of ironic utterances. Recent attitude and stereotype priming research shows that comprehenders are sensitive to emotive aspects of attitudinal meaning in communication, even at subattentive level, and the way they feel about communicative contents does rapidly and non-trivially modulate language comprehension as it unfolds (Bargh 2007; Van Berkum 2010). In two experimental studies we test the combined effects of attitude and gender stereotype priming on attitudinal meaning comprehension in ironic and non-ironic conditions.

The objectives of the second visit were: to (i) to analyze the results obtained in the norming studies designed during the first visit (to Poznań) aiming at establishing gender stereotype triggers and means of activating them in online irony/non-irony attitudinal meaning comprehension, and (ii) to make a final selection of the experimental stimuli, developed during the first visit and validated before the second visit (the set of semantic primes, and ironic and non-ironic affectively loaded stories). On top of that we decided to extend the already planned semantic priming study, by the picture priming study. Therefore during the second visit we (iii) discussed the design of the picture priming study and analyzed the set of picture primes to be used in the picture priming study. The final objective was (iv) the presentation of the experimental design and research rationale in the *Workshop on Irony Comprehension in Autism Spectrum Disorders*, organized by Jean Nicod Institute on 11/04/2011 (<https://sites.google.com/site/workshoirony/>). The workshop boasted such prominent researchers as professor Deirdre Wilson (University College London) and professor Rachel Giora (Tel Aviv University). During the workshop our project received a lot of constructive comments and suggestions, as well as positive feedback from other participants (e.g. Ira Noveck; Deirdre Wilson; Rachel Giora; Philippe De Brabanter).

2. Description of the work carried out during the visit

We discussed the role of gender stereotypes and the impact of attitude semantic/picture priming on ironic/non-ironic stories comprehension task, and focused our attention on the results of the norming studies preceding the two experimental studies: semantic priming study;

picture priming study. Specifically we analyzed and discussed the results of the following validating studies:

(i) Semantic priming. Two norming studies were carried out in order to select stereotypic gender: male/female communication traits. In the first norming study designed to select male/female gender traits attributable to stereotypic communicative traits, 38 male and 38 female French native speakers were asked to name gender traits that have stereotypical association with women and men as far as communication is concerned. Participants were asked to list most salient male and female gender traits/attributes in terms of communicative styles. Two separate lists of communicative traits attributable to (i) male and (ii) female communicative behaviors most conspicuously associated with gender trait features were obtained: males features list (e.g. “argument”, “avenant”, etc. as positive traits; “agressif”, “autoritarie”, etc. as negative traits) and female features list (e.g. etc. “calme”, “clair”, etc. as positive traits; “hypocrite”, “impatient”, etc. as negative traits) to be used in the semantic priming association task.

(ii) The aim of the second gender traits norming study was to assess (i) the valence and the (ii) gender typicality of trait adjectives, in order to have a range of negativity/positivity of male/female communicative traits. A (different) group of 20 males and 20 females were asked to rate the adjectives obtained in the first norming study on 7-point scales in two dimensions (two separate groups of raters; equal number of female and male raters): (a) the negativity/positivity of each trait (1=very negative and 7=very positive) and (b) the gender typicality of each behavior, femininity/masculinity typicality (forced choice: female/male).

As a result of these norming studies, we have obtained four validated (male participants; female participants) sets of adjectives for communicative traits: 1) female/positive, 2) female/negative, 3) male/positive, 4) male/negative that will be used in the semantic priming experiment preceding the irony comprehension task.

(iii) picture priming. A set of male/female positive/negative pictures was selected from the “NimStim set of facial expression” (Tottenham, N., Tanaka, J., Leon, A.C., McCarry, T., Nurse, M., Hare, T.A., Marcus, D.J., Westerlund, A., Casey, B.J., Nelson, C.A. (2009). The NimStim set of facial expressions: judgments from untrained research participants. *Psychiatry Research*, 168(3):242-9) already validated in terms of emotional valence.

The two separate and independent priming tasks: semantic and picture priming, will precede ironic/non-ironic stories comprehension task in two independent experimental studies. Stereotype priming effect will be activated by an implicit association test: semantic or picture, which will precede irony/non-irony comprehension task and will display both gender-stereotypic and gender-neutral prime semantic or picture attribute in four different conditions: female positive; female negative; male positive; male. A control group condition, where participants will have no priming part, only the irony comprehension task, is planned as a baseline comparison group.

Equal numbers of participants will be assigned to each conditions representing the factorial combination of stereotype prime condition 2x valence (positive vs. negative), 2x gender (male, female). At the individual test session, the association test task will be performed first. Each participant will be presented with either a set of trait features, or male/female pictures featuring emotional valence (female positive/female negative, or male positive/negative). Presented to participants as a test of language association ability (semantic priming) or emotion association ability (picture priming), both sets are designed to activate affectively positive/negative gender stereotypic traits. The semantic association test will require an implicit semantic association for each condition. Participants will be asked the following question: “Does the target adjective associate with male or female? Press the button as quickly as possible”. In the picture priming emotional association test, participants will respond to the following question: “Does the picture associate with positive or negative emotion?”. Following the priming part, subjects will be exposed to stories comprehension task.

The experimental stimuli for the main study on ironic/non-ironic comprehension is a set of 16 stories, developed and validated in another norming study, in which 20 male and 20 female participants were asked to assess whether the comment sentence in each story conveys (i) nice/mean; (ii) ironic/non-ironic; (iii) polite/impolite comment. The experimental stories feature the following four conditions:

- 1) 16 stories (8/she; 8/he stories) with critical irony/indirect criticism: [-/+] negative context, positive comment;
- 2) 16 stories (8/she; 8/he stories) with literal criticism: [-/-] negative context, negative comment;
- 3) 16 stories (8/she; 8/he stories) with literal praise: [+ /+] positive context, positive comment;
- 4) 16 stories (8/she; 8/he stories) with praising irony/indirect compliment [+/-] positive context, negative comment.

The set of 16 stories will be displayed in two parts: 8 stories (4/she; 4/he stories) for each condition and 20 distractors will be presented after the semantic association test and 8 stories (4/she; 4/he stories) for each condition and 20 distractors will be presented after the picture association test. The story comprehension task will be preceded by a training session (6 stories). The comprehension task will consist in answering the following question: “Does the comment sentence convey nice/mean comment? Press the button as quickly as possible”.

In the stories we control for the following features: (i) target words of the stories: word length and frequency; word valence; word familiarity; (ii) contexts of the stories: context length and valence; valence expectancy (cloze test); (iii) parsing and critical irony recognition in the offline condition. The national corpus for French language “FranText” (www.frantext.fr) was used in order to match words frequency in the sets of stories.

3. Description of the main results obtained

(i) based on the validation studies of gender communicative traits, we selected the triggers for semantic and picture priming condition;

(ii) based on the valence validation of the stories, both contexts and target words, we selected the final set of the experimental stories featuring: critical irony, praising irony; literal criticism; literal compliment.

Subjects in the two experimental studies will participate in two ostensibly unrelated experimental tasks. The first priming part will consist of semantic priming task, in one experiment, and picture priming task in the other experiment. In the semantic association task, subjects will do an association test featuring male/female stereotypical traits. There will be 4 groups (for 4 priming conditions) and a control group (no priming task). All features will be presented in the middle of the screen. On the top left corner there will be written “FEMALE” and on top right corner “MALE”. Participants will be asked to decide whether the target associates with male or female attributes, by answering to the question: “Does the word belong to the left or to the right category?”. In the emotion association task, subjects will do an association test featuring male and female photographs expressing basic emotions (positive; negative). The photos will be displayed centrally. On the screen top corners, there will be the distribution sets: “POSITIVE” and “NEGATIVE”. Participants will be asked to decide whether the picture presented centrally associates with positive or negative emotion, by responding to the question: “Does the picture belong to the positive/negative emotion set?”

In the second task, subjects will do an online comprehension task, reading mini-stories featuring a male or female target in communicative interactions ending with a comment. Comments will be either directly critical (-/-); indirectly critical (-/+); directly praising (+/+), or indirectly praising (+/-). Subjects will evaluate the target comments expressed as to whether it conveyed nice/mean comment. This will allow us to tap directly the emotional Theory of Mind competence. Affective Theory of Mind has not been researched so far in connection with behavioral responses to ironic/non-ironic emotionally loaded comments.

Experiment planning. The data collection for the experiments is planned to start in May 2011, and continue until the planned number of participants, both ASD and normal subjects have participated. In total at least 64 participants in the comparison group (healthy subjects) are going to be tested. In the HFA/AS group at least 20 participants are going to be tested. Low number of ASD participants results from an objective difficulty in accessing the ASD participants. We discussed experiments timetable and subjects recruitment, above all in relation to a set of features to be matched in both comparison and ASD group: age, gender, education, Verbal IQ, Performance IQ, Total IQ. All participants will sign informed consent before volunteering for this study, in accordance with the local ethical committee and the Declaration of Helsinki. Adults with a clinical diagnosis of Asperger Syndrome (AS) according to DSM-IV R (American Psychiatric Association, 2000) and ASDI (Asperger Syndrome Diagnostic Interview, Gillberg, Gillberg, Råstam, & Wentz, 2001) will be recruited from Albert Chenevier Hospital in Créteil.

The inclusion criteria will be based on retrospective parental information about the early language development of their child. All diagnoses will be made by experienced clinicians and will be based on clinical observations of the participants. Interviews with parents or caregivers using the ADI-R (Autism Diagnostic Interview, Lord, Rutter and Le Couteur, 1994) will be used to confirm the diagnoses. The cut-off points for the three classes of behaviour are reciprocal social interaction 10, communication 8, and stereotyped behaviours 3, respectively. As part of the checking process, the French translation of A-TAC (Autism, tics, AD-HD and other comorbidities; Hansson, Svanstrom Rojvall, Rastam, Gillberg, Gillberg and Anckarsater, 2005) will be completed by the parents. This screening questionnaire is focused on a number of abilities, conducts and behaviours in a child's functioning as compared to his or her peers. Parents are asked to report any problem or specific characteristic observed at any period of life, even when this is no longer present.

Prior to their recruitment, the comparison participants will be screened to exclude any with a history of psychiatric or neurological disorders. All participants will be native French speakers, and had normal/corrected to normal vision. All participants will receive basic neuropsychological screening, which included Verbal and Performance IQs (WAIS-III) (WAIS-III, Wechsler, 1999).

4. Future collaboration with host institution

One more trip to Jean Nicod Institute is planned – during the Spring 2012. This will be the last short visit, so we will focus on analyzing and discussing the obtained results and prepare the results for the publication.

5. Projected publications/articles resulting or to result from the grant

We will present, in a poster format, the first results of the study on subjects typically developed at Barcelona conference in June 2011 and the first results of the study on both comparison group and a group of participants with autism spectrum disorders at Pisa workshop in October 2011. Two articles could therefore result from the study financed by the EURO X-

PRAG grant.

F. Ervas submitted an editorial proposal to Humana.Mente, Journal of Philosophical Studies for a special issue entitled “The Experimental Turn in Philosophical Pragmatics”. The proposal was accepted by Humana.Mente editorial committee and they proposed both an on-line version and a hard copy (ETS Editions, Pisa). The volume will contain contributions coming from both invited authors and contributed authors whose papers will be selected through double-blind review process. The language of the volume will be English. K. Dyzman will write the paper concerning theories of irony. A brief outline of editorial project is the following one:

Modern pragmatics has been defined as “philosophical”, not only because its main representative authors, such as Grice and Austin, were philosophers of ordinary language, but also because it has used linguistic and philosophical analysis as a method to give an explanation of communicative features of language. However, in the last years, plenty of studies have brought classical pragmatic theories in front of the tribunal of experience, to test their power of explanation and prediction. The result has been the growth of a flourishing inter-discipline, called “Experimental Pragmatics”, which claims that understanding an utterance requires access to the speaker’s intention in specific contexts and uses experimental techniques coming from psycholinguistics, cognitive sciences and psychology to bring to light the comprehension mechanisms of non-literal and figurative language. The objective of this issue is to discuss the main empirical results of Experimental Pragmatics and to explore its theoretical influence on “philosophical” pragmatics in its most important research subjects, such as figures of speech, implicatures, ecc. How and to what extent do experimental method and conceptual analysis interact in pragmatics? Which consequences does this experimental turn have for theorizing in pragmatics? (Deadline for submissions: June 30th, 2012; Notification of acceptance: September 30th, 2012; Final version due: October 15th, 2012).

6. Other comments (*if any*)