

## **Referential Accessibility and Anaphor Resolution: The Case of the French Hybrid Demonstrative Pronoun *Celui-Ci/Celle-Ci*<sup>1</sup>**

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Most psycholinguistic studies dealing with the concomitant effects of discourse structure (focusing certain entities more than others) and different types of referential expressions on sentence processing in discourse contexts mainly aim to characterize the referential opposition between anaphoric pronouns and full repeated NPs (Garrod *et al.*, 1994; Gordon *et al.*, 1993, 1995). The aim of our research is to study – in French – another type of referential contrast, that exists between the anaphoric pronoun and the ‘hybrid’ demonstrative pronoun *celui-ci/celle-ci*. In two experiments using reading time measurements, we tested the contrast between these pronouns. The results suggest that both these pronoun types are sensitive to entity focusing, but in opposite ways: indeed, whereas an anaphoric pronoun is expected to signal referential and attentional continuity, the demonstrative pronoun would rather indicate a shift in attention focus (Gundel, 1998). The results also indicate that it is necessary to postulate a distinction between these two linguistic forms in terms of the processing instructions that they carry. We suggest that the presuppositional constraints could be stronger for certain forms than for others.

### **1 Introduction**

As a linguistic procedure “designed to bring into conformity speaker’s and addressee’s model of the current discourse by maintaining the saliency level of some discourse referent already presented within it” (Cornish, 1999:5), anaphora is a very important phenomenon for the psychology of language, in general, and for studies dealing with the nature and role of mental representations used during discourse comprehension, in particular (Garnham, 1997).

Indeed, because it is “more a type of use than a category” (Charolles, 1991), anaphora may be realized via a whole range of referential expressions,<sup>2</sup> from zero forms or unaccented pronouns (typically, a 3<sup>rd</sup> person pronoun), to demonstrative pronouns, demonstrative descriptions, and definite descriptions.

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<sup>1</sup> This paper is a revised and extended version of a paper entitled “Cognitive aspects of pronominal anaphora: the case of the French hybrid demonstrative pronoun *celui-ci/celle-ci*”, which was presented at the DAARC 2002 (Estoril, Portugal, 18-20 September 2002). We would like to thank Francis Cornish and Harriet Dunbar for their helpful comments on the revised version.

<sup>2</sup> In fact, it is not only the referential expression used which realizes anaphora, but also the whole clause in which it occurs (Cornish, 1999; Kleiber, 1994).

These expression types, however, are not equivalent in terms of the procedural instructions they carry, and a better understanding of the way in which each of these forms selects its referent should contribute to improving our knowledge concerning the cognitive processes involved in the resolution of referential expressions.

For example, how do the functional specificities inherent in each type of expression guide sentence processing in different ways? Or how does the choice of one expression (rather than another) affect the way in which the addressee builds his/her own discourse model, as well as the way in which s/he distributes his/her attention within this model?

A number of linguists supporting their work on cognitive accessibility,<sup>3</sup> propose that the different types of referential expressions, via their specific meaning which consists in marking what the cognitive status of the intended referent is in the speaker's and addressee's mental discourse model, would signal different ways in which a sentence may – or should – be resolved (Ariel, 1990, 1996; Chafe, 1994; Givon, 1983; Gundel *et al.*, 1993; Gundel, 1998).

Models such as Ariel's *Accessibility Marking Hierarchy* (1990, 1996) or Gundel *et al.*'s *Givenness Hierarchy* (1993) claim, indeed, that the use of any particular expression, far from being a random choice, is closely connected to the level of accessibility or activation that the mental representation of the referent is assumed to have in the addressee's mental model of the discourse under construction. On the basis of the various cognitive statuses which are assigned to discourse referents, these models provide a formal basis that makes it possible to justify and even to predict the presence or use of a particular marker.

Henceforth, when the referent targeted is assumed to be highly accessible, highly active in the addressee's mental discourse representation, a morphologically and phonologically attenuated form such as a zero and unaccented third-person pronoun should be used, a form whose use signals precisely the '*in focus*' status of the referent (in Gundel *et al.*'s terminology). On the other hand, where the referent is not in focus, but is '*activated*' (in Gundel *et al.*'s terminology) or enjoys a level of '*medium accessibility*' (in Ariel's terminology), a demonstrative pronoun or accented third-person pronoun, whose use codes this cognitive status, will tend to be used. Finally, lexically and accentually more substantial expressions (such as definite full NPs

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<sup>3</sup> That is on the notion whereby the form of referential expressions used to refer to entities in a discourse depends, to a great extent, on the way in which the mental representation of these entities has been previously established.

or proper nouns) are expected to indicate referents bearing a low level of accessibility.

Following Givenness Hierarchy of Gundel *et al.* (1993), six cognitive statuses are then recognized and arranged from most restrictive (currently ‘*in focus*’) to least restrictive (only ‘*type identifiable*’). These statuses are claimed to represent the conventional meanings of the different determiners and pronominal forms placed at each point on the hierarchy (see Table 1).

|          |   |                      |   |          |   |                       |   |                     |   |                   |
|----------|---|----------------------|---|----------|---|-----------------------|---|---------------------|---|-------------------|
| In focus | > | Activated            | > | Familiar | > | Uniquely identifiable | > | Referential         | > | Type identifiable |
| {it}     |   | {that, this, this N} |   | {that N} |   | {the N}               |   | {indefinite this N} |   | {a N}             |

Table 1: Gundel *et al.*'s Givenness Hierarchy (1993)

Therefore, in order to propose valuable distributional patterns of anaphoric expressions, considerable effort has been devoted to characterizing – from a linguistic point of view – the relations between anaphor informativeness and referent accessibility. This work, however, is very much in contrast with the study of processing in the psycholinguistic literature given that, up to now, most psycholinguistic studies dealing with the interaction between the accessibility of discourse referents and referential expressions has essentially been interested in the differences between *only* two types of expressions: unaccented 3<sup>rd</sup> person pronouns and full NPs such as definite descriptions or repeated proper names (Garrod *et al.*, 1994; Gordon *et al.*, 1993; Gordon & Scarce, 1995; Hudson-D’Zmura & Tanenhaus, 1998; Sanford *et al.*, 1988).

Psycholinguistic models of anaphor processing also assign a crucial importance to the accessibility factor. However, the six levels defined by Gundel *et al.* (1993) are usually not distinguished by these models, maybe because experiments contrast only two anaphoric devices (but see (Garrod, 1994), for an attempt in this sense).

For instance, Greene *et al.* (1992) only suggest that entities vary in accessibility, and that highly accessible entities are placed in the focus of attention. Those entities are normally referred by a pronoun. Therefore, “highly accessible” and “in focus” are synonyms under this approach. The relatively loose usage of the Focus notion in psycholinguistic models is related to the heterogeneity of the factors that can affect the accessibility of an entity during discourse comprehension. Some researchers have centred their attention on the effect of syntactic factors on the accessibility (“structural focusing”, (Grosz *et al.*, 1995)), whereas others have argued for focusing based on background knowledge of the topic of discourse (Sanford & Garrod, 1981). Yet, others have proposed that many different factors interact to determine what is in focus

(McKoon *et al.*, 1993; Marslen-Wilson *et al.*, 1993). Despite this variability, all these authors agree that, in a well-constructed discourse, the predicate of a pronoun can often be attached to the most accessible entity. According to McKoon *et al.* (1993), this process is sufficient to resolve most of the anaphoric pronouns, reducing the need to compute difficult inferences to establish the correct referent.

There is growing psychological evidence that anaphoric pronouns (like *he/she*) are very sensitive to entity focusing. They appear to act, indeed, as ‘pointers’ to the discourse focus (i.e. the highly-focused entity). Experimental studies indicate: (1) that sentences containing a pronoun which refers back to the highly-focused entity are easier to process and are read faster than sentences containing a pronoun which refers back to the less-focused entity (Garrod *et al.*, 1994; Gordon & Scearce, 1995; Sanford *et al.*, 1988); and (2) that the use of a repeated name for referring back to the highly-focused entity increases the reading time compared with the use of a pronoun in this same condition – *the repeated-name penalty effect* – (Gordon *et al.*, 1993; Gordon & Scearce 1995; Hudson-D’Zmura & Tanenhaus, 1998). However, with more explicit anaphors (such as repeated names), such a difference of processing (between differently focused entities) was not found (see in particular, (Fossard, 1999; Garrod *et al.*, 1994; Sanford *et al.*, 1988)), which suggests that the focus status of discourse entities has little influence on the processing of repeated full NPs. Indeed, contrary to an anaphoric pronoun – whose interpretation is not independent of the immediate context of use –, a repeated noun is better able to identify its referent in a descriptive fashion (Garrod, 1994). Consequently, the interpretation of repeated full NPs would be less bound by entity focusing.

Now, what about demonstrative pronouns? Turning to Gundel *et al.*’s work (1993), this expression type for which the accessibility level of the intended referent is ‘midway’ between the ‘*in focus*’ status (typically coded by ‘*it*’) and the ‘*uniquely identifiable*’ status (typically coded by ‘*the N*’),<sup>4</sup> could be sensitive to entity focusing, but in a quite original fashion. Indeed, as suggested by Gundel (1998:186): “Demonstratives (especially demonstrative pronouns) and stressed personal pronouns typically imply that the referent is not in focus, i.e. they imply a *focus shift*”.

Also – and given this fact –, we wondered about the constraints likely to affect the interpretation of one particular demonstrative pronoun: the French ‘hybrid’ demonstrative pronoun *celui-ci/celle-ci*.<sup>5</sup> This original indexical

<sup>4</sup> See Table 1, above.

<sup>5</sup> *The latter* or *this one* in English. However, unlike English which does not possess the category of grammatical gender, the French demonstrative pronoun *celui-ci/celle-ci* (plural: masc. *ceux-ci*; fem.

expression, which in Kleiber's phrase would consist in "showing something new in terms of something already known" (1994:177), could be particularly well-adapted to triggering a focus shift.

Following Kleiber's (1994) analysis, this pronoun is indeed atypical, hybrid, because it combines both anaphoric and deictic elements. It is an anaphoric expression by virtue of its pronominal element *lui* which is responsible for the anaphoric aspect of the interpretation of the whole expression, and it is also a deictic expression by virtue of the combination of *ce* and the demonstrative particle modifier *-ci* which is responsible for its deictic value.

So, in the case of anaphoric reference, as illustrated in the example below (1), where the referent has already been introduced into the discourse (that is, when the referent is not 'new' but already 'known', i.e. *Melle Vatnaz*), the use of this pronoun, through its deictic value, would have the effect of isolating, and hence highlighting, the referent in question from within its background context.

- (1) L'ouvrière redit naïvement son mensonge à Melle Vatnaz; celle-ci en vint à parler au brave commis. (Flaubert; Kleiber 1994:186)  
 "The female worker naïvely repeated her lie to Melle Vatnaz; the latter (f.sg) ended up speaking to the good clerk (about it)."

According to Kleiber (1994) and Cornish (1999), this expression type would signal a change in the attention focus already established, that is, it would shift the attention focus from the highly-focused entity towards a less-focused entity in order to bring the latter into the foreground. In brief, the demonstrative pronoun *celui-ci*, also called an 'anaphoric-deictic pronoun', could be specially adapted (more so than a repeated noun) to "drawing the addressee's attention to the member of the set of salient entities already evoked which enjoys the *lower* level of focus at the point of occurrence, i.e. *Melle Vatnaz*" (Cornish, 1999:67). As Kleiber and Cornish pointed out, putting the ordinary third-person pronoun *elle* ('she') in the place of the demonstrative pronoun *celle-ci* – in example (1) above – would have led to a completely different referent (i.e. "the female worker", which constitutes the main protagonist, the most salient referent).

Also, it appears that an additional constraint intervenes in the functioning of the pronoun *celui-ci*. As it is an anaphoric tool for a reference in favour of a background entity, at least two entities must be present. This constraint, of

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*celles-ci*) is a gender- and number-variable pronoun which presupposes that its intended referent is a discrete entity, having already been categorized via the use of a noun whose head provides the gender value of the pronoun (Kleiber, 1994; Cornish, 1999). When *celui-ci* is used as a pure demonstrative pronoun (i.e. without textual antecedent), it must agree with the gender of the noun corresponding to the entity. For instance, when somebody shows a table (feminine gender in French), this person must use *celle-ci* to be understood. If *celui-ci* is used instead, the pronoun is not correct. This requirement suggests that people quickly activate the gender associated to an entity that is not explicitly mentioned.

course, is not relevant for the ordinary pronoun which can be used if only one entity is mentioned.

Consequently, we think that studying the more subtle contrast which exists between the 3<sup>rd</sup> person anaphoric pronoun and the ‘anaphoric-deictic’ pronoun *celui-ci/celle-ci* could be worthwhile. Indeed, as a distinct object of study, *celui-ci* could enable us to obtain further data on the influence of entity focusing on the processing of referential expressions.

We therefore make the assumption that the processing of the demonstrative pronoun *celui-ci/celle-ci* should be sensitive to the focus status of discourse entities (i.e. its referential behaviour should be bound by entity focusing), but in an opposite way to that of the 3<sup>rd</sup> person anaphoric pronoun. In other words, whereas the 3<sup>rd</sup> person anaphoric pronoun, insofar as it indicates that attention is to be maintained on the highly-focused entity, is a preferred marker in accessing discourse focus, the demonstrative pronoun *celui-ci/celle-ci*, since it serves to re-orient attention to a less-prominent discourse referent, could be specialized in the foregrounding of an entity which did not have this status previously.

To test the contrast between both these pronouns, we used a self-paced reading time paradigm in two experiments, with either agreement in gender with only one name (Experiment 1: unambiguous gender cue) or agreement in gender with two names (Experiment 2: ambiguous gender cue).

## 2 Experiment 1

Experiment 1 used a self-paced reading time task to test the intended contrast between the 3<sup>rd</sup> person anaphoric pronoun (*il/elle-‘he/she’*) and the demonstrative pronoun (*celui-ci/celle-ci*) in accessing differently focused discourse entities. In accordance with our hypotheses, our aim was to highlight:

1) a specialization of the 3<sup>rd</sup> person anaphoric pronoun in referring back to the highly-focused entity (i.e. the target sentence containing this pronoun should be easier to process and therefore, should be read faster when it refers to the highly-focused entity than when it refers to the less-focused entity), and conversely;

2) a specialization of the demonstrative pronoun to refer back to the less-focused entity (i.e. the target sentence containing this pronoun should be easier to process and, therefore, read faster when it refers to the less-focused entity than when it refers to the highly-focused entity). In this experiment, gender cue was unambiguous.

## 2.1 Method

### Subjects

A total of forty subjects (mean age  $22 \pm 2.1$  years) participated in Experiment 1. They were all native speakers of French, and were not paid for their participation.

### Materials

| Pronoun<br>Type                             | Entity Type  |   |
|---|--|---|
|   | Entity 1   | Entity 2  |
| 3 <sup>rd</sup> person anaphoric<br>pronoun | Le panier de linge était rempli de vêtements.<br><i>(The linen basket was full of clothes.)</i><br><u>Salomé(i)</u> écoutait la radio en (i)repassant les chemises d'Hervé./<br><i>(Judy was listening to the radio while ironing John's shirts) /</i><br>TS: De fatigue, elle s'allongea sur le lit./<br><i>(Tired, she lay down on the bed) /</i>                  | Le panier de linge était rempli de vêtements.<br><i>(The linen basket was full of clothes.)</i><br>Hervé(i) écoutait la radio en (i)repassant les chemises de <u>Salomé</u> ./<br><i>(John was listening to the radio while ironing Judy's shirts) /</i><br>De fatigue, elle s'allongea sur le lit./<br><i>(Tired, she lay down on the bed) /</i>                   |
| demonstrative<br>pronoun                    | Le panier de linge était rempli de vêtements.<br><i>(The linen basket was full of clothes)</i><br><u>Salomé(i)</u> écoutait la radio en (i)repassant les chemises d'Hervé./<br><i>(Judy was listening to the radio while ironing John's shirts) /</i><br>TS: De fatigue, celle-ci s'allongea sur le lit./<br><i>(Tired, this one (FEM.SG) lay down on the bed) /</i> | Le panier de linge était rempli de vêtements.<br><i>(The linen basket was full of clothes)</i><br>*Hervé(i) écoutait la radio en (i)repassant les chemises de <u>Salomé</u> ./<br><i>(John was listening to the radio while ironing Judy's shirts) /</i><br>De fatigue, celle-ci s'allongea sur le lit./<br><i>(Tired, this one (FEM.SG) lay down on the bed) /</i> |

Note. The referent-entity (entity 1 or entity 2) is underlined for expository purposes. In the text presented to participants, nothing was underlined. In the same way, the co-indexation sign (i) did not appear. The slash indicates the text presentation on the screen. The target sentence (TS) was presented separately on the screen. The English translation of this example is indicated in brackets in italics. \*Hervé is a man's name. For clarity, the translated names are different but have same gender as the French names.

Table 2: Example of an experimental text in all four conditions in Experiment 1

For the experimental texts, a total of 40 three-sentence texts was constructed on the following pattern: the first sentence was an introductory, scene-setting sentence. The second introduced two discourse entities (two characters), one of whom was the highly-focused entity (entity 1), and the other was the

less-focused entity (entity 2). The third sentence, the target sentence, referred to one of the two characters mentioned in the second sentence either via the 3<sup>rd</sup> person anaphoric pronoun (*il/elle*), or via the demonstrative pronoun (*celui-ci/celle-ci*). Each text ended with a ‘true-false’ statement which probed comprehension of the target sentence.

A total of four experimental conditions (2 entity types × 2 pronoun types) were then created for each experimental text (see Table 2).

For each text, the differential level of focusing between the two referent-entities mentioned in the second sentence was obtained as follows:

- the highly-focused entity (entity 1: the first character) was always introduced as the most topical argument of the utterance: it occurred as initial mention and in grammatical subject position in the sentence, being, therefore, the “main protagonist” of the situation described (Gordon *et al.*, 1993; Garrod *et al.*, 1994).
- On the other hand, the expression designating the less-focused entity (entity 2: the second character) was embedded within a participial clause, always occurring in object position of a preposition. This second entity, more deeply embedded in the sentence structure, only plays a very peripheral, minor role within the situation described. Moreover, to increase the topicality of the first entity and therefore to increase the focus differential between the two entities, entity 1 was re-evoked by means of a zero form (PRO in generative analyses) as grammatical subject of the participial clause.

In this first experiment, the pronominal reference was unambiguous, the pronoun agreed in gender with only one of the two character-entities. On the other hand, the semantic information carried by the predicate of the target sentence was relatively compatible on a pragmatic level with both potential referents. This information was ‘neutral’ in relation to the two characters; hence, readers could not use such pragmatic inferences like ‘argument-predicate’ to resolve a given pronoun. The mean length of the target sentences for all the experimental texts was 7.6 words.

In addition to the forty experimental texts, there were forty-eight filler texts. Half of them were similar to the experimental texts, the other half were different, but the ‘true-false’ statements did not test the interpretation of pronouns for the fillers. These statements were designed to encourage comprehension of either the first or the second sentence.

### *Design and Procedure*

Four lists of materials were constructed to ensure that each experimental text occurred in each of the four conditions. The subjects were assigned randomly to lists with the restriction that each list was assigned to an equal number of subjects. Overall, each subject saw 40 experimental texts, 10 in each condition.

Thus, each subject read each text only once, but each text appeared in the four conditions equally often across subjects. The order of presentation of the 88 texts (40 experimental texts + 48 filler texts) was individually randomised for each subject.

Subjects were tested individually. They were instructed to read the text at a normal rate and answer the statements as accurately and as rapidly as they could. The text appeared in the centre of the screen in two successive stages. The first two sentences were presented together. After reading the first two sentences, the subjects pressed the space bar, the two sentences disappeared and the third sentence – the target sentence – was displayed. At the end of the text, the target sentence disappeared when the statement was presented. For half the statements, the intended answer was ‘true’; for the other half, it was ‘false’. After answering the statements by pressing one of two keys marked ‘true’ and ‘false’, subjects were prompted to start the next trial.

Before the presentation of the experimental materials there were ten practice trials, whose primary purpose was to familiarize the subjects with the self-paced reading procedure. The task lasted about forty minutes.

## 2.2 Results and Discussion

The means of the reading times (RTs) for the target sentences were calculated for each subject and each item in each condition. RTs were analysed after eliminating outlier reading times (less than 500 msec or greater than 15 sec), affecting 0.3% of the data. Any data points that were more or less than 2 standard deviations from the mean for a particular subject were replaced with the 2 standard deviations’ cut-off values (5.1% of the data). Then, RTs were normalized in order to take target sentence length (number of characters) into account.

| Pronoun Type                | Entity Type    |              |            |
|-----------------------------|----------------|--------------|------------|
|                             | Entity 1       | Entity 2     |            |
| 3 <sup>rd</sup> pers. Pron. | <i>Error %</i> | 4.75%        | 5%         |
|                             | <i>Mean RT</i> | 40.6         | 45.8       |
|                             | <i>SD</i>      | (10.3) [5,3] | (13) [6,6] |
| Dem. Pron.                  | <i>Error %</i> | 6.75%        | 6.25%      |
|                             | <i>Mean RT</i> | 46.1         | 44.6       |
|                             | <i>SD</i>      | (12.2) [6,8] | (11) [6,2] |

Note. The reading times are given in milliseconds per character. The values in parentheses are the standard deviations with subjects as the random factor; the values in brackets are the standard deviations with items as the random factor.

*Table 3: Means and standard deviations of the reading times of the target sentences and mean percent of errors for the statements in Experiment 1*

Table 3 shows the means and the standard deviations of the reading times of the target sentences and the mean percent of errors for the statements in all conditions.

A  $2 \times 2$  analysis of variance (ANOVA) of Entity-Type (entity 1 vs. entity 2)  $\times$  Pronoun-Type (*il/elle* vs. *celui-ci/celle-ci*) was conducted separately for subjects as the random factor ( $F_1$ ), and for items as the random factor ( $F_2$ ).

#### *Accuracy of answer for the statements*

For all the statements, there was a 94.3% correct answer rate. The results revealed no main effect<sup>6</sup> of either entity-type,  $F_1, F_2 < 1$ , or pronoun-type,  $F_1, F_2 < 1$ . The interaction between these two factors was also not significant,  $F_1, F_2 < 1$ , the different versions of a text did not influence the accuracy of the answer for the statement in a significant way.

#### *Reading times of the target sentences*

The results revealed a main effect of entity-type,  $F_1(1,39)=12.7, p < .002$ ;  $F_2(1,39)=7.2, p < .02$ , reflecting the fact that processing was faster when the target sentence referred back to the highly-focused entity (entity 1) ( $M= 43.3$  msec/char.) than when it referred back to the less-focused entity (entity 2) ( $M= 45.2$  msec/char.).

There was also a main effect of pronoun-type, significant by subjects,  $F_1(1,39)=14.1, p < .001$ , but not by items,  $F_2(1,39)=2.4$ . Target sentences containing a 3<sup>rd</sup> person pronoun were read faster ( $M=43.2$  msec/char.) than those with a demonstrative pronoun ( $M=45.2$  msec/char.).

Most crucially, the interaction between entity-type and pronoun-type was significant,  $F_1(1,39)=8.4, p < .02$ ;  $F_2(1,39)=41.4, p < .001$ . There was a strong effect of focus (i.e. the highly-focused entity) on the processing of the 3<sup>rd</sup> person pronoun: target sentences referring back to entity 1 were read faster with a 3<sup>rd</sup> person pronoun than with a demonstrative pronoun,  $F_1(1,39)=29, p < .001$ ;  $F_2(1,39)=13.5, p < .001$ . As predicted, using a demonstrative pronoun to refer back to entity 1 is penalizing. There was also a specific referential functioning of the 3<sup>rd</sup> person pronoun in referring back to entity 1 rather than to entity 2, the difference being significant,  $F_1(1,39)=20.1, p < .001$ ;  $F_2(1,39)=37.6, p < .001$ .

So, according to our hypotheses, the 3<sup>rd</sup> person anaphoric pronoun seems to act effectively as a 'pointer' to discourse focus.

On the other hand, the 'opposite' effect of focus (in favour of the less-focused entity) which was predicted for the processing of the demonstrative

<sup>6</sup> The 'Main effect' of a factor concerns the global difference between the different levels of this factor (i.e. the difference between Entity 1 and Entity 2), without taking into account the other factor (i.e., Type of pronoun). For more precisions, see (Winer *et al.*, 1996).

pronoun was not significant,  $F_1, F_2 < 1$ . In spite of a small reading time difference which goes in the expected direction (see Table 3), the target sentences referring back to entity 2 were not significantly easier to process with a demonstrative pronoun than with a 3<sup>rd</sup> person anaphoric pronoun. In the same way, the results did not indicate significant differences for the processing of the demonstrative pronoun referring either to entity 2, or to entity 1,  $F_1(1,39)=1.2, p > .2; F_2(1,39)=2.8, p > .09$ .

Except for the results concerning the processing of the 3<sup>rd</sup> person anaphoric pronoun, this first experiment failed to highlight a specialization of the demonstrative pronoun in referring to the less-focused entity. An advantage in reading times was noted in favour of the demonstrative pronoun for referring back to entity 2 when compared with entity 1 (respectively,  $M = 44.6$  msec/char vs.  $M = 46.1$  msec/char). Similarly, when Entity 2 was referred to, the demonstrative pronoun seemed advantageous when compared with the 3<sup>rd</sup> person anaphoric pronoun (respectively,  $M = 44.6$  msec/char vs.  $M = 45.8$  msec/char). However, the two comparisons were not significant.

Why then did subjects not take advantage (or not sufficiently) of the highly specialized 'mode of givenness' associated with the demonstrative pronoun *celui-ci* in retrieving the less-focused entity? The answer may be found in (Charolles, 1995:89) who notes that "*celui-ci* is one of a set of anaphoric forms specialized in the avoidance of risk of ambiguity whose purpose is to select a referent in terms of a contrast within a set of potential candidates".

In the materials used in Experiment 1, any risk of ambiguity was minimal because the gender cue was unambiguous: the pronoun agreed in gender with only one of the two names mentioned. So, to re-test our hypotheses concerning the processing of the pronoun *celui-ci*, we constructed another experiment taking the notion of *avoidance of risk of ambiguity* into account. In this new experiment, gender cue was irrelevant (i.e., ambiguous).

### 3 Experiment 2

Experiment 1 failed to highlight a specialization of the pronoun *celui-ci* in referring to the less-focused entity. We think this failure could be due to the unambiguous gender cue. In order to remedy this, Experiment 2 was constructed with ambiguous gender cue (with agreement in gender with either of the two proper names mentioned). The major aim of Experiment 2 was to bring out the specialization of the demonstrative pronoun *celui-ci* in referring to the less-focused entity. Our hypotheses, then, are unchanged in relation to those of Experiment 1. In this second experiment, we also used a self-paced reading time task to test the predicted contrast between the 3<sup>rd</sup> person anaphoric

pronoun (*il/elle*–‘he/she’) and the demonstrative pronoun (*celui-ci/celle-ci*) in accessing differently focused entities.

### 3.1 Method

#### *Subjects*

A total of forty subjects (mean age  $23 \pm 2.7$  years) participated in Experiment 2. They were all native speakers of French, and were not paid for their participation.

#### *Materials*

For Experiment 2, a set of forty new experimental texts was constructed. Indeed, although initially we wanted to modify the texts of Experiment 1 so that the two characters would be ambiguous from a gender point of view (with two first names of the same gender), we quickly became aware of the difficulty of changing the target sentence verbs in order to coherently orient the predication within the target sentence, either towards entity 1 or entity 2. Therefore, new texts in which the second character (i.e. entity 2) was more involved in the situation described were constructed. In this way, it was easier to find verbs with the desired referential orientation.

As in Experiment 1, the experimental texts had three sentences (see Table 4). The first sentence was an introductory sentence. The second sentence introduced two same-sex characters, one of whom was the highly-focused entity (entity 1: coded in subject position via a first name), and the other was the less-focused entity (entity 2: coded in indirect object position via a description of his or her role in the setting, e.g. *the schoolmistress*). The third sentence, the target sentence, referred to one of the two characters mentioned in the second sentence, either via the 3<sup>rd</sup> person pronoun (*il/elle*), or via the demonstrative pronoun (*celui-ci/celle-ci*).

As the gender cue was not relevant in the processing of the pronominal expressions, two types of target sentence with a different predicative component were constructed for each entity type, orienting the whole predication within the target sentence either towards entity 1 or entity 2. Both types of target sentence were roughly equal in length (a mean of 5.8 words). Each text ended by a ‘yes-no’ question which probed comprehension of the target sentence. A total of four experimental conditions (2 entity types  $\times$  2 pronoun types) were created for each experimental text. As in Experiment 1, forty-eight filler texts were added. Half of them were identical to the experimental texts, the other half were different, but the ‘yes-no’ questions did not test the interpretation of pronouns for the fillers.

| Pronoun<br>Type                                | Entity Type   |   |
|--|---|---|
|  | Entity 1  | Entity 2  |
| 3 <sup>rd</sup> person<br>anaphoric<br>pronoun | Les élèves de l'école se<br>défoulaient pendant la récréation.<br><i>(The schoolchildren were letting<br/>off steam at playtime.)</i><br><u>Marie</u> a donné un coup de pied à<br>la maîtresse dans la cour./<br><i>(Marie kicked the schoolmistress<br/>in the playground) /</i><br>TS: Elle a été sévèrement punie./<br><i>(She was severely punished) /</i>                       | Les élèves de l'école se<br>défoulaient pendant la récréation.<br><i>(The schoolchildren were letting<br/>off steam at playtime.)</i><br><u>Marie</u> a donné un coup de pied à<br><u>la maîtresse</u> dans la cour./<br><i>(Marie kicked the schoolmistress<br/>in the playground) /</i><br>Elle a eu un gros hématome./<br><i>(She got a nasty bruise) /</i>                |
| demonstrative<br>pronoun                       | Les élèves de l'école se<br>défoulaient pendant la récréation.<br><i>(The schoolchildren were letting<br/>off steam at playtime.)</i><br><u>Marie</u> a donné un coup de pied à<br>la maîtresse dans la cour./<br><i>(Marie kicked the schoolmistress<br/>in the playground) /</i><br>TS: Celle-ci a été sévèrement punie./<br><i>(This one (FEM.SG) was severely<br/>punished) /</i> | Les élèves de l'école se<br>défoulaient pendant la récréation.<br><i>(The schoolchildren were letting<br/>off steam at playtime.)</i><br>Marie a donné un coup de pied à<br><u>la maîtresse</u> dans la cour./<br><i>(Marie kicked the schoolmistress<br/>in the playground) /</i><br>Celle-ci a eu un gros hématome./<br><i>(This one (FEM.SG) got a nasty<br/>bruise) /</i> |

Note. The referent-entity (entity 1 or entity 2) is underlined for expository purposes. In the text presented to participants, nothing was underlined. The slash indicates the text presentation on the screen. The target sentence (TS) was presented separately on the screen. The English translation of this example is indicated in brackets in italics.

Table 4: Example of an experimental text in all four conditions in Experiment 2

### Design and Procedure

The experimental design and the self-paced reading procedure were the same as those for Experiment 1, except that the subjects answered 'yes-no' questions rather than 'true/false' statements.

### 3.2 Results and Discussion

The means of the reading times (RTs) for the target sentences were calculated for each subject and for each item in each condition by the same method as for Experiment 1 (5.5% of the data were eliminated). As previously, RTs were normalized in order to take target sentence length (number of characters) into account (See Table 5).

| Pronoun Type                | Entity Type    |              |               |
|-----------------------------|----------------|--------------|---------------|
|                             | Entity 1       | Entity 2     |               |
| 3 <sup>rd</sup> pers. Pron. | <i>Error %</i> | 2.75%        | 4.25%         |
|                             | <i>Mean RT</i> | 49.4         | 59.1          |
|                             | <i>SD</i>      | (11.4) [8.1] | (13.8) [11.4] |
| Dem. Pron.                  | <i>Error %</i> | 7%           | 5.5%          |
|                             | <i>Mean RT</i> | 58.9         | 49.5          |
|                             | <i>SD</i>      | (16.3) [8.9] | (12.3) [9.2]  |

Note. The reading times are given in milliseconds per character. The values in parentheses are the standard deviations with subjects as the random factor; the values in brackets are the standard deviations with items as the random factor.

*Table 5: Means and standard deviations of the reading times of the target sentences and mean percent of errors in Experiment 2*

A  $2 \times 2$  analysis of variance of Entity-Type  $\times$  Pronoun-Type was conducted separately for subjects as the random factor ( $F_1$ ), and for items as the random factor ( $F_2$ ).

#### *Accuracy of answer for the questions*

For all the questions, there was a 95% correct answer rate. As in Experiment 1, neither the main effect of entity-type nor the interaction between entity-type and pronoun-type were significant,  $F_1, F_2 < 1$ . However, unlike Experiment 1, the main effect of pronoun-type was significant in this experiment ( $F_1(1,39)=8.125, p < .01$ ;  $F_2(1,39)=9.286, p < .01$ ) with more errors when a demonstrative pronoun was used in the target sentence.

Finding worse performance for questions dealing with the identification of the demonstrative pronoun referent could suggest that, when gender cue is not relevant, the use of a demonstrative pronoun would become much more sensitive to the focusing constraint. Therefore, the subjects would find ‘breaking’ this constraint less acceptable. Indeed, the ‘unusual’ use of the demonstrative pronoun to refer back to the highly-focused entity seems to have particularly constricted the subjects (maximal error rate in this condition: 7%), which could explain the increase in error rate for the demonstrative pronouns.

#### *Reading times of the target sentences*

Contrary to those of Experiment 1, the reading time results revealed no main effect for either entity-type or pronoun-type,  $F_1, F_2 < 1$ . However, as in the previous experiment, there was a significant interaction effect between the entity-type and the pronoun-type,  $F_1(1,39)= 39.3, p < .001$ ;  $F_2(1,39)= 145.4, p < .001$ . As in Experiment 1, this interaction indicated a strong effect of focus (i.e. the highly-focused entity) on the processing of the 3<sup>rd</sup> person anaphoric

pronoun,  $F_1(1,39)=26.4, p < .001$ ;  $F_2(1,39)=81, p < .001$ , as well as a specific referential functioning of the 3<sup>rd</sup> person anaphoric pronoun to refer back to entity 1 rather than to entity 2,  $F_1(1,39)=38.2, p < .001$ ;  $F_2(1,39)=17, p < .001$ .

The most notable point in the results, however, was that the demonstrative pronoun, this time, was sensitive to entity focusing. Not only was the simple effect of entity 2 conditions within pronoun-type significant,  $F_1(1,39)= 32.7, p < .001$ ;  $F_2(1,39)=58.3, p < .001$  (the target sentences referring back to entity 2 were read faster with a demonstrative pronoun than with a 3<sup>rd</sup> person pronoun), but it was also true for the simple effect of the demonstrative pronoun conditions within entity-type,  $F_1(1,39)=19.8, p < .001$ ;  $F_2(1,39)=24.2, p < .001$  (the target sentences containing a demonstrative pronoun were read faster when they referred back to entity 2 than when they referred to entity 1).

In brief, the ‘lack’ of any relevant gender cue in this experiment seems to have revealed the specialization of the demonstrative pronoun *celui-ci/celle-ci* in accessing the less-focused entity.

More notably than in Experiment 1, these last results suggest that both the pronoun types tested here are sensitive to the focus status of discourse entities, but in opposite ways: if the 3<sup>rd</sup> person pronoun is specialized for maintaining the addressee’s attention on the highly-focused entity, the demonstrative pronoun *celui-ci/celle-ci* would be specialized in re-orienting the addressee’s attention towards the less-focused entity.

#### 4 General Discussion

The results reported here suggest that the referential functioning of the demonstrative pronoun *celui-ci/celle-ci* is constrained in terms of entity focusing, but in an opposite way in comparison with that of the 3<sup>rd</sup> person pronoun *il/elle*.

Is the pronoun *celui-ci* really the mirror image of the pronoun *il*, for all that? Apparently not. Indeed, we saw from the results of Experiment 1 (cf. Table 3) that the convergence of both focus constraint and gender cue towards only one referent was clearly not sufficient for the processing of the demonstrative pronoun to give rise to a rapid identification of its referent (namely, Entity 2).<sup>7</sup> Unlike the 3<sup>rd</sup> person pronoun, for which it seems that both these constraints (focus and gender) are sufficient to make an early commitment to resolution in favour of Entity 1 (Arnold *et al.*, 2000; Garrod *et al.*, 1994; Rigalleau & Caplan, 2000; Sanford & Garrod, 1989) the demonstrative pronoun would be more ‘demanding’ in terms of cognitive effort.

<sup>7</sup> The difference of reading times between both the versions of the demonstrative pronoun was not significant in this first experiment.

Thus, we believe that *celui-ci* is not a converse copy of the pronoun *il*. The way in which this demonstrative pronoun selects its referent is not simply the same as that of the anaphoric pronoun, but inverted.<sup>8</sup> We believe, instead, that *celui-ci* must also conform to another constraint, namely the one related to context which provides a specific class of entities on the basis of which the pronoun *celui-ci* will be able to isolate – and this by virtue of its deictic value – the least focused entity among the set of entities previously evoked.

This additional constraint to which the demonstrative pronoun must conform, which we called ‘*the selection-presupposition constraint*’, would seem to account for the fact that the ‘demonstrative capture’ that the pronoun *celui-ci* operates on its referent is not without consequences on the cognitive processing of this pronoun. This additional presuppositional constraint which is related to the contrastive function of the pronoun *celui-ci* – whose effect is to isolate an element from a class of similar elements – would seem to be specific to this type of pronoun and it is not assumed to exist for the 3<sup>rd</sup> person anaphoric pronoun.

Indeed, unlike the demonstrative pronoun, the anaphoric pronoun does not select its referent in terms of a contrast, and so, its resolution does not need to be based on a specific class of entities. In any case, it functions very well with only one (salient) entity, which is not true of the demonstrative pronoun.<sup>9</sup> The latter, on the contrary, given its hybrid nature, being both anaphoric and deictic, must conform to the selection-presupposition constraint in order to be used in an appropriate manner. As it selects its referent in terms of a contrast, by extracting it from among a set of potential candidates, the demonstrative pronoun would appear to be more demanding in terms of cognitive effort.

Taking the presupposition of selection constraint into account could then explain the additional processing load observed in the case of the French demonstrative pronoun studied here. This proposition, obviously, would need to be explored in greater depth, using a more direct methodology like eye-tracking or even evoked response potentials (ERP). These techniques have a higher level of resolution than the one used here. Therefore, our results, obtained from a

<sup>8</sup> See, also, Kaiser and Trueswell’s study (2003) in Finnish on the referential contrast between the gender-neutral pronoun *hän* (he/she) and the demonstrative *tämä* (this, he/she). Using an eye-movement paradigm, authors show that these two forms are not mirror images of one another. Unlike the pronoun *hän* which tends to refer to subjects, the demonstrative pronoun *tämä* would look at the discourse/pragmatic level and would be used for low-salience referents. “The referential properties of *hän* and *tämä* are not subject to a single common factor, and an accessibility scale is not sufficient to explain the division of ‘referential labour’ between these two expressions” (Kaiser & Trueswell, 2003:6).

<sup>9</sup> Unlike the pronoun *celui-ci*, the pronoun *il* functions very well with only ONE salient entity. Example: ‘*Marie pleure. Elle est triste (Mary is crying. She is sad)*’. But, ‘*Marie pleure. \* Celle-ci est triste (Mary is crying. \* This one (FEM.SG) is sad)*’.

segment-by-segment reading, are preliminary. A word-by-word reading procedure allowing the observation of the pronoun processing effect (as a specific element) would also have been possible, however, a preference has been given to longer segments giving a more natural reading.

Finally, the conclusions of this study about the pronoun *celui-ci* may not be extended to demonstratives in general, in particular the most frequent and unmarked demonstratives such as English *this* or French *ce*. *Celui-ci* and similar devices in other languages are somewhat related to demonstratives, but they are a very specialized kind of demonstratives.

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