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Indeterminacy in L1 French grammars: the case of gender and number agreement

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Abstract

Although L1 French speakers (FS) acquire the formal features of gender and number early, agreement appears to take longer, leading to persistent difficulties even for cases of straightforward agreement within a nominal or verbal phrase. This begs the questions of how adult FSs (n = 168) may fare with idiosyncratic cases of agreement such as nominal affective constructions and past participles as measured by a written grammaticality judgment/correction task and preference/grammaticality judgment task. The findings showing that participants performed better at correctly accepting than rejecting stimuli, are consistent with an increasing number of empirical studies revealing individual differences among adult L1 speakers. The findings are discussed from a generative perspective and the usage-based perspective of the Basic Language Cognition-High Language Cognition theory of L1 proficiency (Hulstijn, 2015).

Keywords: gender; agreement; L1 French speakers; indeterminacy; nominal affective constructions; past participles; causative faire

1. INTRODUCTION

The French language established itself during the sixteenth century with the help of writers (e.g. Joachim du Bellay, Deffense et Illustration de la langue francoyse, 1549) and royal edicts (e.g. Edit de Villers-Cotterêts, 1539). As it became a political instrument in the seventeenth and eighteenth centuries, French underwent a process of codification and standardization with prescriptive grammars and dictionaries as well as the creation of the Académie française in 1635. Standard French has maintained its prestige, and “proper usage” is highly valued by its speakers (Lodge, 1993; Battye, Hintze and Rowlett, 2000). However, even a strongly codified language such as French cannot escape some indeterminacy or idiosyncrasies as with agreement phenomena.

Agreement (or concord) in written French concerns the formal features of gender and number as lexical properties of nouns and determiners, respectively. Nouns are
either masculine or feminine although grammatical homonyms such as *livre* ‘book’/‘pound-FEM’ are both (L’Huillier, 1999; Price, 2008). Most nouns have a singular form and mark the plural with -s or -x (Wagner and Pichon, 1991), while gender is morphologically expressed with various suffixes such as -e, -elle, aie, -aine for feminine or -eau, -on, -isme for masculine (Surridge, 1986). The gender and number features have morphosyntactic consequences for adjectives, past participles, determiners and pronouns due to syntactic rules governing structures such as a determiner phrase containing a noun, determiner and adjective (e.g. *la-FEM-SG belle-FEM-SG pomme-FEM-SG verte-FEM-SG* ‘the beautiful green apple’) as well as verbal phrases (e.g. *voilà les-FEM-PL fleurs-FEM-PL que j’ai cueillies-FEM-PL* ‘here are the flowers I picked’).

French children are aware of inflectional morphology before they start receiving formal literacy instruction (e.g. Nagy, Carlisle and Goodwin, 2013). They seem to discover plural markers when they learn to read (Jaffré and Fayol, 2005) and are sensitive to verbal inflectional errors (Carrasco-Ortiz and Frenck-Mestre, 2014). However, it is well documented that 11–12-year-old children still experience difficulties with encoding the appropriate morphosyntactic information in their written production such as number agreement, maybe because although it is semantically motivated, it is often neutralized in speech (e.g. Manesse and Cogis, 2007; Totereau, Brissaud, Reilhac and Bosse, 2013).

Empirical data show that grammatical gender knowledge emerges early on as well (Höhle, Weissenborn, Kiefer, Schulz and Schmitz, 2004; Shi and Melançon, 2010), while knowledge of gender categorization and agreement is robust in 30-month-old toddlers (Cyr and Shi, 2013), but French gender agreement is rarely investigated (Boloh and Ibernon, 2010). It appears that 18-month-old toddlers are sensitive to grammatical gender cues in nominal phrases with an incongruent gender article as in *le-*MAS poussette-FEM ‘the stroller’ (van Heugten and Christophe, 2015) and master gender agreement on the determiner first, while agreement on the adjective can take longer with frequent errors as late as age 5 (Roulet-Amiot and Jakubowicz, 2006; Royle and Valois, 2010). The most common written gender marker of the feminine, -e, is not yet acquired by the end of primary school (Cogis and Brissaud, 2019) or middle school (Brissaud, 2015), and 50% of sixth to ninth graders continue to omit it on adjectives in written production (Bosse, Brissaud and Le Levier, 2020).

Regarding number agreement, Nazzi, Barrière, Goyet, Kresh and Legendre (2011) have established that French babies as young as 18-months are sensitive to grammaticality contrasts for both singular and plural determiners and non-adjacent verbal forms. However, even highly educated adults may produce written subject-verb agreement errors as in *le chien-SG des voisins-PL *arrivent-PL-arrive SG* ‘the neighbors’ dog arrives’ (Fayol and Got, 1991; Fayol, Largy and Lemaire, 1994). This is a well known attraction error whereby verb agreement is realized with the closest noun instead of the subject of the verb (e.g. Bock and

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1*Gens* ‘people’, *arrhes* ‘deposit’, *frais* ‘costs’, *fiançailles* ‘engagement’ are examples of common, invariable plural nouns. The meaning of a few nouns fluctuate with number such as *vacance* ‘vacancy-FEM-SG’, *vacances* ‘vacation-FEM-PLU’, *lettre* ‘letter-FEM-SG’, *lettres* ‘literature-FEM-PLU’ or *menotte(s)* ‘small handcuffs-FEM-PLU’, *menottes* ‘handcuffs-FEM-PLU’.
Eberhard, 1993; Bock and Miller, 1991; Franck, Vigliocco and Nicol, 2002; Vigliocco, Butterworth and Garrett, 1996). In addition, children’s oral production include number inflection on nouns before they do so on verbs (e.g. Bassano, 2000), while their written production show fewer gender and number markings on adjectives than on nouns (Fayol, Totereau and Barrouillet, 2006).

In summary, early sensitivity and acquisition of number and gender do not preclude persistent difficulties for cases of straightforward agreement within a nominal or verbal phrase. This begs the question of how adult FSs would react to cases of variable or incongruent agreement, referred to as idiosyncrasies for short. To the best of my knowledge, this has not yet been tested empirically, so we do not know whether idiosyncrasies in the standard, prescriptive grammar of French would translate into indeterminacy in the mental grammar of FSs, that is their competence in a generative sense, as measured by their performance in two written tasks, a grammaticality judgment task (GJT) and a preference grammaticality judgment task (PGJT).

However, given that a growing number of experimental studies are showing that “native-speaker convergence is a myth: there are, in fact, considerable individual differences in adult L1 speakers (for recent reviews, see Dąbrowska, 2012, 2015; Farmer, Misyak and Christiansen, 2012; Hulstijn, 2015)” (Dąbrowska, 2019:73), we may find similar divergences among our participants as they perform two written elicitation tasks, a grammaticality judgment /correction task and a preference/grammaticality judgment task.

For instance, in Mulder and Hulstijn (2011), Dutch L1 speakers (n = 98) split by age groups (18–35, n = 42; 36–50, n = 20; 51–76, n = 36) were asked to perform seven lexical tasks and four speaking tasks in order to assess whether their fluency, knowledge and memory varied with their age and education level. Older participants were slower to respond in the lexical tasks, performed more poorly in the two word span tasks, but better in the vocabulary knowledge task. The speaking tasks did not reveal differences between age groups. The authors report the unexpected finding that most participants produced clear violations of nominal gender and subject-verb number agreement in the speaking tasks, regardless of their education level. Dąbrowska (2019) compared the performance of L1 and adult L2 learners on grammatical comprehension, vocabulary and collocations. Although L1 speakers outperformed L2 learners as expected, large individual differences and overlap were found between the two groups. Earlier studies had already shown that L1 speakers’ intuitions concerning the grammaticality of certain sentences (e.g. Chipere, 2001) and their comprehension of sentences (e.g. Dąbrowska, 1997) vary depending on their education level.

The next section will provide a descriptive account of idiosyncrasies in agreement from a prescriptive, standard perspective (e.g. Battye et al., 2000), then the methods used to test how L1 French speakers may perform on elicitation tasks with written stimuli exemplifying these idiosyncrasies as well as reflexive and causative verbs. Will they perform as a homogenous group at the 90% accuracy expected of L1

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2A reviewer correctly notes that it would interesting to see if subject-verb agreement errors are also produced with audible singular-plural contrasts such as *vient/vienent* ‘come-SG/PL’. Phonological representations may indeed contribute to such errors in written French (e.g. Barra Jover, 2009).
speakers (e.g. Dronjic and Helms-Park, 2014) with their performance aligning with prescriptive grammar, or will they diverge from it and show individual differences?

2. IDIOSYNCYRASIES IN GENDER AGREEMENT

2.1. Nominal affective constructions

Romance languages such as French, Spanish and Italian exhibit qualitative nominals – also referred to as affective constructions – in a N1 de N2 structure with conflictual agreement (e.g. Casillas Martínez, 2003; Masini, 2016) as exemplified in (1a) (Hulk and Tellier, 1998: 183) and (1b, c) (Hulk and Tellier, 2000: 55) for French.

(1) a. *Ton phénomène de fille est bien distraité/*distrait.
     your-MSC phenomenomon-MSC of girl- FEM is quite absent-minded- FEM /*MSC
     ‘That character of a daughter of yours is quite absent-minded’.

b. *Son abomination de beau-père est craint/*crainte.
     his abomination-FEM of father-in-law-MSC is feared-MSC/*FEM
     ‘His abomination of a father-in-law is feared’.

c. *Ce que ta tornade de fils peut être étourdissant/*étourdissante.
     how your tornado- FEM of son- MSC can be dizzying- MSC/*FEM
     ‘Your tornado of a son can be dizzying’.

According to Hulk and Tellier (1998, 2000), when N1 and N2 differ in gender, the adjective agrees with the animate N2 assumed to be the nominal head of the construction as in (1a, b, c). However, when the N2 is an inanimate noun, the adjective may or may not agree. In (2a, b) the adjective agrees with the inanimate N2 (Hulk and Tellier, 1998: 185).

(2) a. *Ta saleté de toit a été repeint /*repeinte des dizaines de fois.
     your dirt-FEM of roof has been repainted-MSC/*FEM tens of times
     ‘Your dirt of a roof has been repainted tens of times’.

b. *Les marins trouvent cette saloperie de vent particulièrement exaspérant /*exaspérante.
     the sailors find this filth-FEM of wind- MSC particularly exasperating-MSC/ *FEM
     ‘The sailors find this disgusting wind particularly exasperating’.

Examples of an adjective agreeing with the N1 instead of the N2 in cases of inanimate nouns appear in (3) (ibid):

(3) a. *Je peux vous garantir que ce bijou de symphonie sera désormais inscrit /*inscrite dans tous les répertoires.
     I can guarantee that this jewel-MSC of symphony-FEM will be from now on included-MSC/*FEM in all the repertories
     ‘I can assure you that from now on, this jewel of a symphony will be included in all the repertories’.

b. *Ce chef-d’œuvre de fresque Michelangelo l’a peint/*peinte dans des
conditions très difficiles.
this masterpiece-MSC of fresco-FEM Michelango it painted-MSC/*FEM in some conditions very difficult
‘Michelangelo painted this masterful fresco in very difficult conditions’
c. Je trouve ce chef-d’œuvre de robe absolument ??exquis /??exquise.
I find this masterpiece-MSC of dress-FEM absolutely ??exquisite-MSC /?? FEM
‘I find this masterpiece of a dress absolutely exquisite’.

The authors speculate that NS judgments would fluctuate between the two genders in (3c), so presumably, the adjective would agree with either the N1 or the N2. This “striking unease with the data suggests that the masculine form on the adjective/participle in [(3)] is not a reflex of agreement with N1, but rather the default gender choice” (ibid, 2000: 57). Unfortunately, the authors do not include any information about the FSs who provided these judgments or how they were elicited. Moreover, it is unclear what they mean by a default gender choice if agreement in either gender is acceptable. It may be more accurate to characterize (3c) as an example of indeterminacy or variability.

### 2.2. Past participles
Some participles used as adjectives agree with the noun they modify only when they are postposed: ci-joint ‘attached’, approuvé ‘approved’, attendu ‘expected’, étant donné ‘given’, excepté ‘excepted’, (y-, non-)compris ‘included’, passé ‘passed’, supposé ‘supposed’, vu ‘seen/given’, as in (4):

\[(4)\]
\[\begin{align*}
a. & \text{ Il est onze heures passées/*passé.} \\
& \text{it is eleven hours-FEM-PL past-FEM-PL/*MSC-SG} \\
& \text{‘It is past eleven p.m.’} \\
b. & \text{ Passé /*passées onze heures, il sera trop tard.} \\
& \text{past- MSC-SG /* FEM-PL eleven hours-FEM-PL, it be-FUT too late} \\
& \text{‘After eleven p.m., it will be too late’}. \\
c. & \text{ Veuillez lire les pièces ci-jointes/*ci-joint.} \\
& \text{please read the documents- EM-PL attached-FEM-PL /*MSC-SG} \\
& \text{‘Please read the attached documents’}. \\
d. & \text{ Ci-joint /*ci-jointes les pièces envoyées par le secrétaire.} \\
& \text{attached the documents-FEM -SG/*FEM-PL sent-FEM-PL by the secretary} \\
& \text{‘Attached are the documents sent by the secretary’}. \\
\end{align*}\]

Agreement appears to be optional with fini ‘finished’ and mis à part ‘except for’:

\[(5)\]
\[\begin{align*}
a. & \text{ Fini/finies les vacances!} \\
& \text{finished-MSC-SG/ FEM-PL the vacations} \\
& \text{‘The vacations are over’}. \\
\end{align*}\]

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3 An anonymous reviewer points out that such cases were regulated by the “Arrêté français du 28 décembre 1976 relatif aux tolérances grammaticales et orthographiques” (cf. Journal officiel du 9 Février 1977).

4 An anonymous reviewer points that liaison may play a role in the feminine agreement of mise à part.
b. Mis /mise à part ma maladie, je vais bien.
excepted- MSC-SG/ FEM- SG my sickness, I go well
‘Except for my sickness, I’m doing well’.

Finally, ci-inclus ‘included’ never agrees in gender or number with the noun it modifies, be it preposed or postposed as in (6).

(6) a. J’ai lu toutes les lettres ci-inclus/*ci-incluses.
I read all the letters-FEM-PL included MSC-PL/*FEM-PL
‘I read all the letters that included in here’
b. Ci-inclus/*ci-incluses les lettres du président.
included-MSC-PL/*FEM-PL the letters-FEM-PL of the president
‘The letters of the president are included in here’

Past participles in compound tenses such as passé composé also agree in gender and number with direct object pronouns preceding them as in (7) (Bouchard, 1997):

(7) a. Les lettres? Oui je les ai écrites.
the letters- FEM-PL. Yes I them have written-FEM-PL
‘The letters? Yes, I wrote them’.
b. Voilà les chemises que j’ai repassées.
here are the shirts-FEM-PL that I have ironed- FEM-PL
‘Here are the shirts I ironed’.

However, agreement is optional when there is overt wh-movement of the quantifier combien as in (8a), but not when combien remains in situ as in (8b):

(8) a. Combien en avez-vous acheté(es)?
how many of them have you bought-FEM-PL
‘How many did you buy?’
b. Vous en avez acheté/*es combien?
you of them have bought-* FEM-PL how many
‘How many did you buy?’

Boivin (1998) argues that the lack of agreement is an indication that there is no movement of the object through [Spec, AgrO]. Moreover, en does not agree with past participles, contrary to other direct object pronouns, as in (9):

(9) a. Les roses? Oui, Sophie les a achetées/*acheté
the roses? Yes, Sophie them has bought-FEM-PL/*SG
‘The roses? Yes, Sophie bought them’
b. Les roses? Oui, Sophie en a acheté/*achetées
the roses? Yes, Sophie them has bought/*FEM-PL
‘The roses? Yes, Sophie bought some’

Hence, the past participle agrees with the preposed (but not postposed) direct objects, but anecdotal evidence as well as oral data from a variationist
perspective (e.g. Gaucher, 2015) suggest that a few reflexive verbs tend to be difficult even for FSs such as se rendre compte de ‘to realize something’ (compte is the direct object) and causative faire as in elle les a fait couper ‘she had them cut’; whatever the object may be (e.g. flowers, hair), it is a complement of couper, not fait, so the past participle does not agree with the direct object.

2.3. Gender fluctuation with number

The gender of a few nouns fluctuates with number: orgue ‘organ’, délice ‘delight’ and amour ‘love’ are masculine in the singular, but feminine in the plural. Gens ‘people’ is an invariable plural noun with either male and/or female referents, but it agrees in the feminine with preposed adjectives and in the masculine with postposed adjectives as in les vieilles-fem/*vieux-masc gens sont heureux-masc/*heureuses-fem ‘old people are happy’. Moreover, les jeunes gens ‘young people’ is always masculine and the referents may be all masculine or both masculine and feminine, but not all feminine as in les jeunes gens intelligents-masc/*intelligentes-fem ‘the intelligent young people’.

2.4. Epicenes

There are several nouns with animate referents which are only masculine or feminine regardless of the gender of the referent. For instance, ange ‘angel’, bébé ‘baby’, témoin ‘witness’, génie ‘genius’ or ascendant ‘ancestor’ are masculine while victime ‘victim’, connaissance ‘acquaintance’, doublure ‘body double’ or personne ‘person’ are feminine. This is also the case for some titles such as Altesse ‘Royal Highness’, Eminence ‘Eminence’, Excellence ‘Excellency’ or Sainteté ‘holiness’ which are all feminine.5

2.5. Invariable adjectives

Adjectives typically agree in number and gender with the noun they modify, but there are quite a few which are invariable in that they are not marked for gender or number such as color adjectives derived from nouns (e.g. argent ‘silver’, lavande ‘lavender’), with a few exceptions for both gender and number (e.g. violet(s)-masc-sg/pl, violette(s)-fem-sg/pl ‘purple’) or for gender, but not number (e.g. châtain/châtaigne ‘chestnut brown-sg-pl’). Adjectives of color modified by another adjective remain invariable as well (e.g. une jupe-fem gris-masc clair-masc ‘a light-gray skirt’) as do adjectives borrowed from other languages (e.g. clean, cool, halal, inuit, zen).

To summarize, French displays various idiosyncrasies in agreement alongside straightforward agreement within a noun phrase or a verbal phrase. The affective constructions appear to exhibit inherent variability depending on the animacy of N2, while the other cases (i.e. past participles, combien, gender fluctuation with number, epicenes and invariable adjectives) can be categorized

5Not tested here (but see Ayoun 2018) are also epicenes, which may be used with either gender depending on the referent such as juge, artiste, partenaire, stagiaire.
as well established exceptions in standard, prescriptive grammars (e.g. Grevisse and Goosse, 2016; Riegel, Pellat and Rioul, 2018). The question is how do FSs react to these idiosyncrasies in an experimental setting? A study was designed to elicit their judgments with two different tasks. The stimuli included all the idiosyncrasies in agreement reviewed above. The causative and reflexive verbs are straightforward cases of agreement, but they were included because of anecdotal evidence suggesting they may be difficult for FSs.

3. METHODS

3.1. Research questions

The main research question asks: will FSs’ performance align with prescriptive grammar with a minimum of 90% accuracy, or will it diverge from it and show individual differences? In other words, will FSs handle cases of idiosyncratic agreement as a homogeneous group because they share the same mental grammar, or will their performance be heterogeneous because their mental grammar allows for some indeterminacy and divergence from standard, prescriptive grammar?

If the FSs’ performance displays some indeterminacy, will it depend on: a) the elicitation task? b) the type of idiosyncrasies? c) their education level and/or age?

The N1 de N2 constructions will be examined separately because it is unclear whether adjectives agree with an animate N2, but not necessarily an inanimate N2. They are thus a case of indeterminacy in prescriptive grammar. Again, participants are expected to perform at least at 90% accuracy, the minimum criterion for L1 speakers (e.g. Dronjic and Helms-Park, 2014).

3.2. Participants and tasks

The participants are L1 French speakers (n = 168) who lived in various cities in France at the time of the data collection. Academic listservs were used to recruit professors and students who were then asked to enlist their friends and families in order to reach people of diverse socio-economic backgrounds. A background questionnaire revealed that the final composition of the participant pool included graduate students in M.A. or doctoral programs (n = 57), professors (n = 49), non-academic professionals with graduate degrees (n = 13), non-professionals (high school graduates) (n = 35) and retired people (n = 14). 38 male and 130 female participants averaged 39.51 years in age (19–74 range) (Ayoun, 2018).

The participants performed a grammaticality judgment task (GJT) and a preference/grammaticality judgment task (PGJT). Both tasks were written, computerized, and accessible from a website and without time limits. Upon completion, the participants clicked on a submit button and the raw data were saved to a folder so that they may be coded to run statistical analyses. The data collection was spread over three sessions: the participants completed the GJT during the first session, then the PGJT twice, once during session 2 and once during session 3.

6The retired answer was unfortunately not anticipated, so the background questionnaire did not request participants to indicate what their professions were when they were active.
The PGJT presented pairs of complete sentences that differed only by the presence or lack of agreement. Participants had to make two decisions with the help of pull-down menus: first choose the sentence they preferred, then indicate whether the other sentence, that is, the one they did not choose, was correct, incorrect or if they did not know. The stimuli included 24 pairs of sentences for each of the two sessions for a total of 48 sentences.

The GJT required the participants to indicate whether a complete sentence was correct, incorrect or if they did not know; they were asked to correct the sentences they rejected as incorrect. The stimuli included 64 complete sentences illustrating affective structures (n = 10), epicenes (n = 14), idiosyncrasies (as a general category including *amours, orgues, Pâques, délices*, n = 8), past participles (n = 5), causative (n = 6), reflexive verbs (n = 3), invariable adjectives (n = 3). The ‘don’t know’ option was included to reduce the possibility that participants would guess if they were unsure; having that information increases the reliability of their answers and provides an indication of their confidence levels. Participants were instructed to rely on their first intuition while performing both tasks.

4. RESULTS
4.1. Grammaticality judgment task

The accuracy means from a chi-square analysis are displayed in Table 1 and show that overall, participants performed relatively well in correctly accepting grammatical stimuli (84.1%), but poorly in rejecting ungrammatical stimuli (50.9%). The difference is statistically significant (p < .001). Their confidence levels measured by the ‘don’t know’ percentages are high since the percentages are low (2.7% overall).

Table 2 displays accuracy means by categories which include everything but the N1 *de* N2 constructions which will be examined separately. The only accuracy mean above 90% is for the grammatical stimuli (92.5%) illustrating epicenes; the other means are much lower and always reflect a better performance on grammatical than ungrammatical stimuli. All the differences are significantly different. The ‘don’t know’ percentages vary a bit, but remain low 1.8%–4.9%.

Table 3 shows how the participants performed in each of the sub-categories of idiosyncrasies. With the exception of *gens, amour, Pâque(s)*, the accuracy means for correctly accepting grammatical stimuli are much better than for correctly rejecting ungrammatical stimuli. The difference is statistically significant (Pearson $\chi^2 = 568.656$, df = 2, $p < 0.001$). *Pâque(s)* and *délice(s)* had only grammatical stimuli. The 90% criterion is met only for *amour* and invariable adjectives. The ‘don’t know’ percentages vary from 0.6% for ‘amour’ to 6.3% for reflexive verbs and concern ungrammatical stimuli in both cases.

Table 4 shows the results for the N1 *de* N2 constructions. Participants indicated whether they thought the sentences were grammatical (G), ungrammatical (U) or if they did not know (DK). The ‘corrections’ column lists the number and percentage of participants (out of 168) who provided corrections to the sentences they rejected as ungrammatical (see Appendix A for the complete list).
The results for animate nouns are mixed: with a feminine animate N2 (stimuli 3, 9, 12), participants tended to accept agreement with the masculine N1; however, with a masculine animate N2, they rejected agreement with a feminine N1. There is a stronger tendency to accept feminine agreement of an inanimate N2. The only stimulus (#15) with a feminine N1 and masculine N2 split the participants: 50.6% for accepting as grammatical and 45.2% for rejecting as ungrammatical.

The corrections indicate that participants generally preferred a masculine agreement for an animate N2 (41.7% and 50.6% of participants) as well as the inanimate N2 (29.8% of participants). Most of the causative corrections were appropriate (39.3% to 45.2% of participants), but erroneous corrections were provided for 4 grammatical stimuli by a small percentage of participants (7.1% – 13.6%). *Gens* generated numerous corrections in addition to the appropriate *certaines gens* (24.4% of participants), most replaced *gens* with *certaines personnes* or *les vieilles personnes*. The past participles of reflexive verbs were appropriately corrected, but to varying degrees (*se sont acheté*, 29.2%; *s’est souvenue*, 17.3%; *se sont rendu compte*, 26.8%). Participants’ corrections showed they preferred a lack of agreement for *combien* (*livres*, 31.5%; *dragées*, 22.6%), but not *aspirines* (17.3%; and seven other corrections). The past participles were generally appropriately corrected (*y compris*, 45.8% to 49.4%; *étant donné*, 35.1%; *passé*, 29.8%), with only a few erroneous corrections for *étant donné* (9.5%). The epicenes generated a few overcorrections (*ascendant*, 13.7%; *cancre*, 11.9%). The nouns with a fluctuating gender with number were appropriately corrected (e.g. *orgues*, 34.5%; *amour*, 60.7%); but 53.7% of the participants erroneously corrected *délices*.

The results of the chi-square analysis in Table 5 reveal a significant difference between correctly accepting (81.4%–85.5%) and correctly rejecting (45.4%–61.3%) stimuli for each of the five groups of participants. The professional group performed best followed by the professor, retired, non-professional and student groups.

An ANOVA was performed to obtain finer-grained results. Accuracy means are displayed in Table 6 by correctly accepted (CA), incorrectly rejected (IR) and don’t know (DK).
The average for IR is 13.7% with a 12.7%–16.5% range, while the means average for IA is 46.98% with a 40.1%–51.1% range, so participants clearly failed to reject quite a few ungrammatical stimuli. The participants’ performance decreases from retired (56.8%) to professor (51.6%), non-professional (47.7%), professional (45.8%) and student (44.1%) for CR. The SDs vary quite a bit as well suggesting individual differences between the participants. A statistically significant difference between groups was found for correctly rejected stimuli (sum of squares = 2669.242, df = 4, mean square = 667.311, F = 2.518, p = 0.043, Eta-squared = 0.024). A post hoc Tukey test revealed that the only difference approaching significance was between the student and the retired groups (mean difference = -12.74, standard error = 4.856, p = 0.071).

In order to see whether age was a factor in the participants’ performance in addition to their education level, we ran a Pearson correlation test. We found a

| categories    | stimuli                        | participants’ responses | grammatical | ungrammatical | don’t know | total |
|---------------|--------------------------------|-------------------------|-------------|---------------|------------|-------|
|               | count                          |                         |             |               |            |       |
| past participles | grammatical stimuli            | count                   | 504         | 309           | 27         | 840   |
|               |                                |                         |             |               |            |       |
|               |                                | %                       | 60.0%       | 36.8%         | 3.2%       | 100%  |
|               | ungrammatical stimuli          | count                   | 455         | 504           | 49         | 1008  |
|               |                                | %                       | 45.1%       | 50.0%         | 4.9%       | 100%  |
| idiosyncracies | grammatical stimuli            | count                   | 1534        | 271           | 43         | 1848  |
|               |                                | %                       | 83.0%       | 14.7%         | 2.3%       | 100%  |
|               | ungrammatical stimuli          | count                   | 220         | 429           | 23         | 672   |
|               |                                | %                       | 32.7%       | 63.8%         | 3.4%       | 100%  |
| epicenes      | grammatical stimuli            | count                   | 2643        | 152           | 61         | 2856  |
|               |                                | %                       | 92.5%       | 5.3%          | 2.1%       | 100%  |
|               | ungrammatical stimuli          | count                   | 333         | 162           | 9          | 504   |
|               |                                | %                       | 61.1%       | 32.1%         | 1.8%       | 100%  |
| causatives    | grammatical stimuli            | count                   | 266         | 59            | 11         | 336   |
|               |                                | %                       | 79.2%       | 17.6%         | 3.3%       | 100%  |
|               | ungrammatical stimuli          | count                   | 298         | 359           | 15         | 672   |
|               |                                | %                       | 44.3%       | 53.4%         | 2.2%       | 100%  |

Know correct (DK-C) for grammatical stimuli; correctly rejected (CR), incorrectly accepted (IA) and don’t know incorrect (DK-I) for ungrammatical stimuli.

Table 2. Accuracy means on the GJT by categories

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positive correlation for correctly rejected stimuli ($r = .260, p < 0.001$), a negative correlation for incorrectly accepted stimuli ($r = -0.235, p = 0.002$), and a small positive correlation between a correct percentage (combining correctly accepted and correctly rejected stimuli) ($r = .159, p = 0.039$). There was no correlation for correctly accepted stimuli alone or the ‘don’t know’ percentages.

Finally, we ran an ANOVA with a subset of the participants ($n = 25$), those who had obtained at least 90% on correctly accepted stimuli (see Appendix C for complete results). The means range from 92.1% to 97.4% for correctly accepted stimuli (CA), and they are close on incorrectly rejected stimuli (IR) (0.0%–7.9%). However, the most interesting finding is regarding ungrammatical stimuli: although they performed as expected on CA, there is a wide variation between

Table 3. Accuracy means by categories of idiosyncrasies on the GJT

| stimuli          | grammatical stimuli | ungrammatical stimuli | don’t know |
|------------------|---------------------|-----------------------|------------|
| gens             | 80.4%               | 16.7%                 | 3.0%       |
|                  | 34.7%               | 61.1%                 | 4.2%       |
| Pearson $\chi^2$ | 86.915, df = 2, $p < 0.001$ |
| amour            | 94.0%               | 4.8%                  | 1.2%       |
|                  | 10.1%               | 89.3%                 | 0.6%       |
| Pearson $\chi^2$ | 241.559, df = 2, $p < 0.001$ |
| orgue(s)         | 82.7%               | 11.9%                 | 5.4%       |
|                  | 47.6%               | 48.8%                 | 3.6%       |
| Pearson $\chi^2$ | 54.181, df = 2, $p < 0.001$ |
| Pâque(s)         | 86.3%               | 11.3%                 | 2.4%       |
| délice(s)        | 59.2%               | 39.3%                 | 1.5%       |
| Pearson $\chi^2$ | 32.583, df = 2, $p < 0.001$ |
| combien/en       | 60.7%               | 33.3%                 | 6.0%       |
|                  | 56.8%               | 38.7%                 | 4.5%       |
| Pearson $\chi^2$ | 1.659, df = 2, $p < 0.436$ |
| reflexive verbs  | 73.8%               | 23.2%                 | 3.0%       |
|                  | 43.5%               | 50.3%                 | 6.3%       |
| Pearson $\chi^2$ | 41.500, df = 2, $p < 0.001$ |
| invariable adjectives | 92.1% | 6.3% | 1.6% |
| Pearson $\chi^2$ | 568.656, df = 2, $p < 0.001$ |
| total            | 75.0%               | 22.5%                 | 2.5%       |
|                  | 39.3%               | 56.6%                 | 4.2%       |
| Pearson $\chi^2$ | 568.656, df = 2, $p < 0.001$ |
Table 4. Findings by stimuli for N1 de N2 constructions

| stimuli | participants’ responses | G   | U   | DK  | corrections |
|---------|-------------------------|-----|-----|-----|-------------|
| stimuli N1 de N2 animate |                           |     |     |     |             |
| 3. *Ton phénomène de fille est bien distraite* | 61.3% | 29.8% | 8.9% | 25 | 14.9% |
| 9. *Ce clown de Jeanne était tordant* | 58.9% | 32.7% | 8.3% | 27 | 16.1% |
| 12. *Votre numéro de Marie est toujours amusant* | 87.5% | 9.5% | 3.0% | 6  | 2.6% |
| 21. *Votre tornade de fils est tout essoufflée* | 31.0% | 66.1% | 3.0% | 85 | 50.6% |
| 35. *Son abomination de mari est encore emprisonnée* | 31.0% | 64.3% | 4.8% | 70 | 41.7% |

Pearson $\chi^2 = 178.127$, df = 8, $p < 0.001$

| stimuli N1 de N2 inanimate |                           |     |     |     |             |
|---------------------------|---------------------------|-----|-----|-----|-------------|
| 15. *Ta saleté de toit a été repeinte une dizaine de fois* | 50.6% | 45.2% | 4.2% | 50 | 29.8% |
| 18. *Ta reproduction de film a été mal reçue* | 88.7% | 6.0% | 5.4% | 3  | 1.8% |
| 23. *Ce bijou de symphonie sera inscrit au répertoire* | 83.9% | 11.9% | 4.2% | 14 | 8.3% |
| 27. *Ce chef d’œuvre de peinture sera exposé au MOMA* | 89.3% | 7.1% | 3.6% | 6  | 3.6% |
| 44. *Son imitation de bijou n’a pas encore été vendue* | 79.2% | 17.3% | 3.6% | 19 | 11.3% |

Pearson $\chi^2 = 122.891$, df = 8, $p < 0.001$

Table 5. Accuracy means by participant background

| Participants | answer key | correct | incorrect | don't know |
|--------------|------------|---------|-----------|------------|
| professor    | correct    | 85.0%   | 12.8%     | 2.2%       |
|              | incorrect  | 41.5%   | 55.0%     | 3.5%       |

Pearson $\chi^2 = 529.121$, df = 2, $p < 0.001$

| student      | correct    | 83.5%   | 13.5%     | 3.0%       |
|              | incorrect  | 50.8%   | 45.4%     | 3.8%       |

Pearson $\chi^2 = 373.668$, df = 2, $p < 0.001$

| retired      | correct    | 81.4%   | 16.5%     | 2.0%       |
|              | incorrect  | 36.6%   | 56.8%     | 3.1%       |

Pearson $\chi^2 = 151.497$, df = 2, $p < 0.001$

| professional | correct    | 85.5%   | 13.0%     | 1.5%       |
|              | incorrect  | 50.2%   | 61.3%     | 3.6%       |

Pearson $\chi^2 = 107.640$, df = 2, $p < 0.001$

| non-professional | correct    | 84.6%   | 13.2%     | 2.2%       |
|                 | incorrect  | 46.2%   | 50.9%     | 2.9%       |

Pearson $\chi^2 = 305.269$, df = 2, $p < 0.001$
participants for rejecting ungrammatical stimuli (CR) with accuracy means ranging from 17.4% to 73.9%. The post hoc Tukey test shows that the mean difference (−12.7438) between students and retired almost reaches statistical significance ($p = 0.071$). For instance, participant 4 obtained 94.7% (CA) and 5.3% (IR) on grammatical stimuli, but only 39.1% (CR) and 39.1% (IA) on ungrammatical stimuli; the ‘don’t know’ percentage also jumps from 0.0% for grammatical to 21.7% for ungrammatical stimuli.

### 4.2. Preference/grammaticality judgment task

The statistical analyses combined the raw data from both sessions. The reader may recall that participants first indicated which of two sentences they preferred and then whether the other sentence was (un)grammatical or they did not know. Table 7 displays the accuracy means for the preferred sentences, while Table 8 shows how the participants rated the other sentence.

Hulk and Tellier’s predictions are supported for animate nouns since participants chose the sentence where the masculine or feminine N2 agrees with the adjective for four out of five stimuli. The predictions are also supported for inanimate nouns since Hulk and Tellier argue that the adjective may or not agree and participants are almost evenly split: the N2 agrees with the adjective for three out of five stimuli. However, they reject a slightly greater number of sentences as ungrammatical for inanimate versus animate nouns (64.4% vs 59.4%). The accuracy means for the other idiosyncrasies range from 71% to 75.2% and are even lower for rejecting ungrammatical sentences in the second part of the task (63.3% to 74.3%). The ‘don’t know’ percentages are much higher than for the GJT, indicating lower confidence levels.

Tables 9 and 10 show accuracy means by participant backgrounds for the preferred sentence and grammaticality of the rejected sentence. They are significantly different for the latter, but not the former, with the retired group obtaining the highest means (82.1%) followed by the professional group (79.2%), while the students and professors obtained the lowest means (74.5% and 74.8%, respectively).

Table 11 displays the detailed findings for the N1 de N2 constructions.
The ‘pref(erence)’ column shows the percentage of participants who preferred sentence (a) or (b); the next three columns indicates how they rated the other sentence, that is, the sentence they did not select. For instance, 41.1% of the participants preferred sentence (1a) and the other sentence was rated as grammatical by 14.5%, ungrammatical by 66.7%, while 18.8% did not know.

| Categories         | Count | Correct | Incorrect | Total |
|--------------------|-------|---------|-----------|-------|
| past participles   | 1008  | 840     | 1848      |       |
|                    | %     | 54.5%   | 45.5%     | 100%  |
| idiosyncracies     | 2805  | 555     | 3360      |       |
|                    | %     | 83.5%   | 16.5%     | 100.0%|
| epicene            | 555   | 2805    | 3360      |       |
|                    | %     | 16.5%   | 83.5%     | 100.0%|
| causative          | 383   | 625     | 1008      |       |
|                    | %     | 38.0%   | 62.0%     | 100.0%|
| total              | 6401  | 2335    | 8736      |       |
|                    | %     | 73.3%   | 26.7%     | 100.0%|

Pearson $\chi^2 = 602.633$, df = 3, $p < 0.001$

| Categories         | Count | Grammatical | Ungrammatical | Don't know | Total |
|--------------------|-------|-------------|---------------|------------|-------|
| past participles   | 2976  | 314         | 70            | 3360       |       |
|                    | %     | 88.6%       | 9.3%          | 2.1%       | 100.0%|
| idiosyncracies     | 1754  | 700         | 66            | 2520       |       |
|                    | %     | 69.6%       | 27.8%         | 2.6%       | 100.0%|
| epicene            | 2976  | 314         | 70            | 3360       |       |
|                    | %     | 88.6%       | 9.3%          | 2.1%       | 100.0%|
| causative          | 564   | 418         | 26            | 1008       |       |
|                    | %     | 56.0%       | 41.5%         | 2.6%       | 100.0%|
| total              | 6253  | 2245        | 238           | 8736       |       |
|                    | %     | 71.6%       | 25.7%         | 2.7%       | 100.0%|

Pearson $\chi^2 = 981.808$, df = 6, $p < 0.001$
Participants always prefer for the animate N2 to agree with the adjective whether it is masculine or feminine. With an inanimate N2, there is no clear preference: agreement can be with N1 (i.e. stimuli 7a, 14b) or N2 (i.e. stimuli 5a, 4b, 16a), regardless of gender.

The complete results for the other categories appear in Appendix B. They are summarized in Table 12.

The ‘accurate preference’ column shows the percentage of participants who selected the grammatical stimuli and the next two columns indicate the percentage who correctly rejected ungrammatical stimuli and incorrectly rejected grammatical stimuli. Only *gens* meets the 90% criterion with a 90.6% average, but participants rejected almost as many grammatical (60.7% average) as ungrammatical stimuli (67% average). The participants’ performance in the other categories is well below 90% with a wide range depending on the stimuli. They perform best at rejecting ungrammatical stimuli with reflexive verbs and worst with *amour*.

Table 12 does not include *combien* because agreement is optional when there is overt movement and that is reflected in the participants’ responses who are almost equally split between agreement (56.3%) and non agreement (54.9%), but a larger percentage of participants reject the former than the latter as ungrammatical (average of 80.1% and 61%, respectively). The ‘don’t know’ responses range from 2.5% to 26.5%.
5. DISCUSSION AND CONCLUSION

FSs performed two different elicitation tasks exemplifying various cases of idiosyncratic agreement to address the main research question of whether their performance would align with prescriptive grammar or would diverge from it and show individual differences. The results support the latter since the participants’ performance rarely reached the 90% criterion expected of L1 speakers.

On the GJT, the highest percentage of 92.5% is for epicenes on correctly accepted stimuli, but they rejected only 32.1% of ungrammatical stimuli; they performed equally poorly at rejecting ungrammatical stimuli for idiosyncrasies (63.8%) and causatives (53.4%) while correctly accepting 83.0% and 79.2% of the stimuli, respectively. The participants’ performance was equally poor on the PGJT. Aside from the particular case of affective constructions, participants preferred the correct sentence for 71%, 71.8% and 75.2% of the causatives, epicenes and
idosyncrasies, respectively. They tended to rate the non-preferred sentences as ungrammatical (69.8%, 63.3% and 74.3%, respectively).

Since the FSs’ performance displayed some indeterminacy, we can address the other research questions. First, their performance did depend on the elicitation task. Overall, they performed better at accepting grammatical stimuli than rejecting ungrammatical stimuli on the GJT. But, excluding affective constructions, their highest accuracy means when selecting the sentences they preferred on the PGJT is only 83.5%. Even when they selected the appropriate sentence, they sometimes failed to reject its ungrammatical counterpart. Participants also provided some ungrammatical corrections to sentences they had appropriately rejected on the GJT.

This uneven performance betrays an uncertainty on the part of these FSs in spite of their confidence levels which were generally high, but not always. They were more confident on the GJT (0.6%–6.3% of ‘don’t know’ responses) than on the PGJT (11.7%–17.3% for the non-preferred sentence grammaticality and up to 27.3% for affective constructions). L1 speakers’ confidence is generally high with ceiling performance on various tasks as with Italian L1 speakers whose accuracy on a written grammatical gender assignment task ranged from 90.0% to 99.7% along with negligible ‘don’t know’ percentages (0%–0.1%) (Ayoun and Maranzana, 2022).

| Table 12. Accuracy preference/(un)grammaticality |
|-----------------------------------------------|
| Category                        | participants’ responses |
|                                | accurate preference | correctly rejected | incorrectly rejected |
| invariable adjectives          | average             | 84.1%             | 84.8%             | 57.7%             |
|                                | range               | 76.8%–92.4%       | 82.2%–87.1%       | 50%–61.5%         |
| causative                      | average             | 71%               | 79.3%             | 46.8%             |
|                                | range               | 64.3%–76.2%       | 78.9%–79.5%       | 32.5%–69.6%       |
| past participle                | average             | 76.9%             | 73.9%             | 63.9%             |
|                                | range               | 67.3%–88.7%       | 67.3%–86.2%       | 57.9%–70.5%       |
| reflexive verbs                | average             | 78.6%             | 90%               | 81.4%             |
|                                | range               | 70.2%–87.5%       | 81.7%–100%        | 73%–93.2%         |
| epicene                        | average             | 77.6%             | 67.4%             | 41.8%             |
|                                | range               | 41.1%–97.6%       | 44.9%–97.6%       | 18.5%–75%         |
| number                         | average             | 74.2%             | 80%               | 64.7%             |
|                                | range               | 19.6%–100%        | 66%–93.5%         | 63.6%–86.7%       |
| gens                           | average             | 90.6%             | 67%               | 60.7%             |
|                                | range               | 84.5%–95.8%       | 59.3%–78.9%       | 34.8%–87.5%       |
| amour                          | average             | 72.3%             | 56.7%             | 61.2%             |
|                                | range               | 71.4%–73.2%       | 49.2%–64.2%       | 57.8%–64.6%       |
L1 speakers are also typically able to correctly accept grammatical stimuli while correctly rejecting ungrammatical stimuli. For instance, in Kail (2004), French adults were highly accurate in their performance of an on-line sentence processing task, failing to detect grammatical violations only 3.7% of the time. Our participants’ failure to reject an average of 45.7% of ungrammatical stimuli is thus surprising and difficult to explain if one assumes that L1 speakers’ mental grammars follow prescriptive rules.

Second, the FSs’ performance depended on the category of idiosyncrasies. They did well with *amour*, invariable adjectives and epicenes on the GJT, but only 60.0% of participants correctly accepted participles, for instance. The appropriateness of the corrections depended on the type of participles, exposing another indeterminacy. The PGJT reveals a variable performance as well: participants did well with invariable adjectives and *gens*, but had high means for incorrectly rejecting grammatical stimuli exemplifying participles and reflexive verbs.

Third, their personal background partially influenced the FSs’ performance. The education level impacted the accuracy means for correctly accepting sentences on the GJT (from 81.4% for retired to 85.0% for professor and 85.5% for professional); there is a bigger difference between groups on correctly rejecting sentences that is less dependent on the level of education (45.4% for student to 61.3% for professional). In addition, positive correlation was found between age and correctly rejected stimuli ($r = .260, p < 0.001$), a negative correlation for incorrectly accepted stimuli ($r = -.235, p = 0.002$), and a small positive correlation with the overall correct percentage ($r = .159, p = 0.039$). In other words, older participants performed better than younger participants.

Regarding affective constructions, Hulk and Tellier’s predictions were supported: the adjective agrees with an animate N2, but not necessarily with an inanimate N2. It appears that the participants’ performance reflects the indeterminacy present in the grammar itself. Indeed, indeterminacy is part of language which is naturally reflected in L1 grammars. We acknowledge the small number of stimuli for both animate and inanimate nouns. Future studies should include a larger number of both. Also, since Spanish exhibits similar affective constructions, it would be interesting to compare L1 French and L2 Spanish participants on at least two different elicitation tasks with similar stimuli.

These results are thus consistent with those obtained on a gender assignment task, the first task these participants completed: strong lexical and gender effects with an overall accuracy of 72.5% and a significantly better performance on masculine nouns (82.4%) than feminine nouns (73.8%) or nouns which are both masculine and feminine (61.5%) were found. The participants’ performance also depended on whether the stimuli were simple nouns or compounds, common or uncommon, or had a vocalic or consonantal initial. A strong lexical effect confirmed the hypothesis that gender must be acquired for each individual lexical item (Ayoun, 2018).

The results are also consistent with previous studies showing individual differences in adult L1 speakers. How do we account for them and should we

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7For a discussion of feature indeterminacy and resolution, see Dalrymple and Kaplan (2000). See also Fedden (2019) for a sample of 22 different languages displaying sporadic agreement.
attempt to reconcile participants’ performance on structures illustrating prescriptive rules of standard grammars? From a generative perspective, it was assumed that a grammar is “descriptively adequate to the extent that it correctly describes the intrinsic competence of the idealized native speaker” (Chomsky, 1965: 24). In that sense, current standard grammars do not describe our FSs’ competence, if their performance is an accurate reflection of their competence. Thus, grammars could adopt a more flexible approach and relax their prescriptive rules, or we could accept FS variability as proposed by Hulstijn (2015) with the BLC-HLC (Basic Language Cognition–High Language Cognition) theory within a usage-based perspective. Basic language cognition is defined as the language cognition that all L1 speakers share, while differences are observed in higher, extended language cognition. BLC is limited to frequent grammatical structures and common lexical items in speech, while HLC applies to infrequent morphosyntactic structure and uncommon lexical items, both in written and spoken language. The BLC-HLC theory is supported by a growing number of studies investigating various morphosyntactic structures. They show that age and education level impact L1 speaker performance (see Hulstijn, 2015 for an extensive review; Hulstijn, 2011, 2017, 2019, 2020). The idiosyncrasies tested here would thus fall under HLC.

L2 acquisition studies should take L1 speaker variability into account (e.g. Mulder and Hulstijn, 2011) and provide more background information about their L1 speaker controls who tend to be highly educated participants, thus accentuating differences between L1 speakers and L2 learners (e.g. Dąbrowska, 2019). Future research focusing on language learners in general would benefit from it.

Finally, noticeable differences among L1 speakers across different elicitation tasks and morphosyntactic structures strongly suggest that we need to heed the increasingly loud call to revise our definition of the prototypical L1 speaker. Although few voices would still claim as structuralists Pike (1947) or Nida (1949) did that L1 speakers are infallible and always right, L1 speakers are still idealized and reaching a “native-like” competence is still seen as the goal of L2 learners, setting them up for failure (e.g. Birdsong and Gerken, 2013). The “native speaker’s myth” has been dispelled (e.g. Ayoun, 2018) with clear consequences for L2 learners as well as for the debate between competence, performance and prescriptive norms. Future studies could collect information about their participants’ attitudes and beliefs regarding their L1 to inform that debate.

Although the difficulties of providing a better definition for an L1 speaker is no easy task and is beyond the scope of the current study, it is a necessary one, particularly from an L2 acquisition perspective (see e.g. Bonfiglio, 2013; Dewaele, Bak and Ortega, 2021; Escudero and Sharwood Smith, 2001; Joseph, 2017).

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### Appendix A Corrections to the grammaticality judgment task

| stimuli # | corrections                                                                 | total n |
|----------|-----------------------------------------------------------------------------|---------|
| 2        | Toutes les vieilles gens ont assisté à la messe de minuit                    | 31      |
|          | personnes                                                                   | 13      |
|          | tous les vieils                                                             | 1       |
|          | tous les vieilles gens                                                      | 1       |
|          | toutes les vieils                                                           | 1       |
|          | tous les gens                                                               | 2       |
|          | vieilles personnes                                                          | 2       |
|          | toutes les vieilles personnes                                               | 4       |
|          | tous les vieux                                                              | 1       |
|          | les vieux ou les personnes âgées                                             | 1       |
|          | tous les                                                                    | 1       |
|          | toutes les personnes âgées (“not gens since I don’t know its gender”)       | 1       |
|          | assistées                                                                    | 1       |
|          | tous les vieux                                                              | 2       |
| 3        | Ton phénomène de fille est bien distraite                                     | 36      |

(Continued)
Continued.

| stimuli # | corrections                                                                 | total n |
|-----------|-----------------------------------------------------------------------------|---------|
| 1         | ta                                                                          | 4       |
|           | distrait                                                                    | 25      |
|           | ta fille est un phénomène, elle est bien distraite                           | 2       |
|           | distrait (refers to phénomène, not to fille)                                | 3       |
|           | “distrait ou distraite, I accept both”                                      | 2       |
| 2         | L’église résonnait du son des orgues chrétiens                               | 66      |
|           | orgues chrétiennes                                                          | 58      |
|           | du son chrétien des orgues                                                  | 2       |
|           | au son                                                                       | 5       |
|           | l’église résonnait du son des orgues                                         | 1       |
| 3         | Tous les médicaments, l’aspirine y comprise, sont dangereux                 | 88      |
|           | y compris                                                                   | 77      |
|           | (aspirine) comprise                                                         | 6       |
|           | l’aspirine comprise/l’aspirine y compris                                    | 5       |
| 4         | Sa grand-mère est le seul ascendant survivant de notre famille              | 34      |
|           | la seule ascendant (survivante)                                             | 20      |
|           | vivant                                                                      | 1       |
|           | descendant                                                                  | 5       |
|           | le seul ascendant                                                           | 1       |
|           | la seule descendant (sur)vivante                                            | 3       |
|           | “I think that both masculine and feminine would be correct”                 | 1       |
|           | de sa famille                                                               | 2       |
|           | “I don’t know if we can say une ascendant”                                  | 1       |
| 5         | Ma soeur était le pire cancre de la classe                                  | 21      |
|           | ma soeur était le cancre de la classe                                        | 1       |
|           | la pire (cancre)                                                            | 20      |
| 6         | Ce clown de Jeanne était tordant                                            | 40      |
|           | tordante                                                                     | 27      |
|           | cette clown de Jeanne était tordante                                        | 2       |
|           | le clown de Jeanne                                                          | 5       |
|           | cette clown de Jeanne                                                       | 2       |
|           | “I think we would find a way to avoid the agreement with the adjective with a different expression like ce clown de Jeanne nous a bien fait rire/ était à se tordre de rire” | 3 |
|           | ce clown de Jeanne était tordant ou Jeanne était tordante                   | 1       |
| 7         | Nous avons savouré des délices bretonnes                                    | 92      |

(Continued)
| stimuli # | corrections                                                                 | total n |
|-----------|-----------------------------------------------------------------------------|---------|
| bretons   |                                                                             | 89      |
| bretonnes |                                                                             | 3       |
| 11        | J’ai toujours dit que ma femme était un vrai génie                          |         |
|           | une vraie génie                                                            | 6       |
| 12        | Mon frère est une bourrique têtue comme pas deux                            | 13      |
|           | têtu                                                                        | 7       |
|           | mon frère est une bourrique, têtu comme pas deux                            | 5       |
|           | mon frère a une tête de bourrique                                          | 1       |
| 15        | Ta saleté de toit a été repeinte une dizaine de fois                         | 54      |
|           | c’est le toit qui a été repeint (pas la saleté), ton sale toit ou la saleté du toit a été repeinte | 3       |
|           | (a été) repeint                                                             | 50      |
|           | la saleté de ton toit a été repeinte                                        | 1       |
| 17        | Sa majesté Louis XIV n’était pas satisfaite des travaux                      | 14      |
| 21        | Votre tornade de fils est tout essoufflée                                    |         |
|           | tout essoufflé                                                              | 85      |
| 22        | Certains gens ne partent jamais en vacances                                 | 63      |
|           | certaines (gens)                                                            | 41      |
|           | certaines personnes                                                         | 22      |
| 23        | Ce bijou de symphonie sera inscrit au répertoire                             | 14      |
| 25        | Ils se sont encore achetés des CDs                                          | 71      |
|           | CD                                                                          | 22      |
|           | acheté                                                                      | 49      |
| 26        | Les vieux gens sont soupçonneux de tout et de rien                         | 69      |
|           | vieilles                                                                    | 30      |
|           | les vieilles gens sont soupçonneuses                                        | 20      |
|           | les vieilles personnes                                                      | 5       |
|           | les vieils gens sont soupçonneux                                            | 1       |
|           | les vieux sont soupçonneux                                                  | 2       |
|           | les vieilles gens sont soupçonneux                                          | 2       |
|           | les vieilles personnes sont soupçonneuses                                   | 5       |
|           | les personnes âgées sont soupçonneuses                                      | 3       |
|           | les vieilles gens sont soupçonneux                                          | 1       |

*(Continued)*
| stimuli # | corrections                                           | total n |
|----------|-------------------------------------------------------|---------|
| 27       | Ce chef d’œuvre de peinture sera exposé au MOMA       | 6       |
|          | exposé                                                |         |
| 29       | Voilà les livres. Combien en avez-vous lus?           | 53      |
|          | lu                                                    |         |
| 30       | Tous les journalistes, y compris Claire Chazal, sont en grève | 89      |
|          | y compris                                            | 83      |
|          | y compris ou Claire Chazal comprise                  | 3       |
|          | Claire Chazal comprise                               | 1       |
|          | “y compris is a frozen expression”                    | 2       |
| 32       | Combien de dragées avez-vous mangées? Il n’y en a plus!| 43      |
|          | mangé                                                 | 38      |
|          | mangés                                                | 5       |
| 34       | Une amour si violente ne pouvait pas durer!           | 108     |
|          | un amour si violent                                   | 102     |
|          | un amour si violent ou des amours si violentes       | 6       |
| 35       | Son abomination de mari est encore emprisonnée        | 74      |
|          | emprisonné                                            | 70      |
|          | son abominable mari est encore emprisonné             | 3       |
|          | “emprisonné (refers to husband, not to abomination)” | 1       |
| 36       | Voilà la maison que nous avons faite construire à la campagne | 67      |
|          | fait                                                  | 66      |
|          | “both versions fait/e are possible”                   | 1       |
| 37       | Cette église abrite un chœur et un orgue magnifiques  | 15      |
|          | une orgue                                             | 5       |
|          | des orgues                                            | 5       |
|          | magnifique                                            | 4       |
|          | “I am not sure about the gender of orgue”             | 1       |
| 38       | Estelle sera toujours un casse-cou, un vrai garçon manqué! | 24      |
|          | une casse-cou                                         | 22      |
|          | “est casse-cou (without an article)”                  | 2       |
| 39       | Quand Pâques sera passé et que les vacances seront finies, je serai triste | 18      |
|          | passée                                                | 12      |
|          | passées                                               | 4       |
|          | “I am always unsure about the gender of Pâques”       | 2       |

(Continued)
| stimuli # | corrections | total n |
|-----------|-------------|---------|
| 43        | Etant données les circonstances, on a préféré rester chez nous | 59 |
| 44        | Son imitation de bijou n’a pas encore été vendue | 19 |
| 45        | Etant donné la situation, les choses ne risquent pas de s’arranger | 16 |
| 46        | Passée une certaine heure, tous les magasins sont fermés | 50 |
| 47        | Marie ne s’en est pas du tout souvenu | 31 |
| 48        | Je n’aime pas la robe que la mariée a faite faire | 76 |
| 49        | La voiture que j’ai fait réparer est encore au garage | 23 |
| 50        | Les marchandises que vous avez fait acheminer sont arrivées | 12 |
| 51        | Ces hommes sont toutes des crapules peu recommandables | 83 |
| 52        | Combien d’aspirines avez-vous pris? | 42 |
| 53        | Pierre postera les lettres que le maire a faites écrire | 74 |
| 54        | Voilà les roses que j’ai fait livrer pour le mariage | 16 |
| 55        | Elle a des yeux noisette magnifiques, tu ne trouves pas? | 10 |
| 59        | Les jeunes filles ne se sont pas rendues compte de leur erreur | 45 |
### Appendix B Preference task results by categories (sessions 2 and 3)

| N1 de N2 animate                  | Pref. | G     | U     | DK   |
|-----------------------------------|-------|-------|-------|------|
| 1a. Mon cauchemar de belle-mère sera absent, Dieu merci | 41.1% | 23.2% | 59.6% | 17.2% |
| 1b. Mon cauchemar de belle-mère sera absente, Dieu merci | 58.9% | 14.5% | 66.7% | 18.8% |
| 3a. Cette catastrophe de gamin s’est débrouillée pour tomber | 35.7% | 25.0% | 61.1% | 13.9% |
| 3b. Cette catastrophe de gamin s’est débrouillé pour tomber | 64.3% | 30.0% | 53.3% | 16.7% |
| 13a. Ce singe d’actrice n’a pas été retenu pour ce film | 56.6% | 21.9% | 63.0% | 15.1% |
| 13b. Ce singe d’actrice n’a pas été retenu pour ce film | 43.5% | 15.8% | 63.2% | 21.1% |
| 16a. Cette andouille de Paul s’est perdue en ville | 24.4% | 21.3% | 61.4% | 17.3% |
| 16b. Cette andouille de Paul s’est perdu en ville | 75.6% | 14.6% | 70.7% | 14.6% |
| 2a. Cette beauté de mannequin est invitée de partout | 83.9% | 33.3% | 48.1% | 15.5% |
| 2b. Cette beauté de mannequin est invitée de partout | 16.1% | 31.9% | 49.6% | 18.4% |
| N1 de N2 inanimate                 | Pref. | G     | U     | DK   |
| 5a. Ta cochonnerie de vélo s’est écrasé contre le mur | 50.6% | 20.5% | 62.7% | 16.9% |
| 5b. Ta cochonnerie de vélo s’est écrasée contre le mur | 49.4% | 29.4% | 58.8% | 11.8% |
| 7a. Ce cauchemar d’aventure sera bientôt terminé | 78.0% | 13.5% | 75.7% | 10.8% |
| 7b. Ce cauchemar d’aventure sera bientôt terminée | 22.0% | 14.5% | 69.5% | 16.0% |
| 4a. Cet amour de robe a été cousu à la main | 47.0% | 9.0%  | 75.3% | 15.7% |
| 4b. Cet amour de robe a été cousue à la main | 53.0% | 12.7% | 65.8% | 21.5% |
| 14a. Ce rêve de poupée a été vendue aux enchères | 45.8% | 31.9% | 57.1% | 11.0% |
| 14b. Ce rêve de poupée a été vendu aux enchères | 54.2% | 14.3% | 58.4% | 27.3% |
| 16a. Leur merveille de spectacle sera très applaudi | 67.9% | 31.3% | 50.0% | 18.5% |
| 16b. Leur merveille de spectacle sera très applaudi | 32.1% | 14.0% | 67.5% | 18.4% |
| Invariable adjectives              | Pref. | G     | U     | DK   |
| 23a. C’est un bel homme avec ses cheveux argent | 83.3% | 25.0% | 50.0% | 25.0% |
| 23b. *C’est un bel homme avec ses cheveux argent | 16.7% | 4.3%  | 87.1% | 8.6%  |
| 6a. *Il a fait peindre les murs d’une vilaine couleur pastelle | 23.2% | 9.3%  | 82.2% | 8.5%  |
| 6b. Il a fait peindre les murs d’une vilaine couleur pastel | 76.8% | 28.2% | 61.5% | 10.3% |
| 14a. Elle n’hésite pas à porter des jaunes canari ou citron | 92.3% | 23.1% | 61.5% | 15.4% |
| 14b. *Elle n’hésite pas à porter des jaunes canaris ou citrons | 7.7%  | 5.8%  | 85.2% | 9.0%  |

| Gens                             | Pref. | G     | U     | DK   |
|----------------------------------|-------|-------|-------|------|
| 8a. * Certaines jeunes gens ont choisi de faire grève | 13.7% | 33.1% | 59.3% | 7.6% |
| 8b. Certaines jeunes gens ont choisi de faire grève | 86.3% | 39.1% | 34.8% | 26.1% |
| 18a. Les professeurs ont refusé de rencontrer certains jeunes gens | 91.1% | 13.3% | 66.7% | 20.0% |

(Continued)
| Gens | | Pref. | G | U | DK |
|------|---|-----|---|---|----|
| 18b. *Les professeurs ont refusé de rencontrer certaines jeunes gens | | 8.9% | 29.4% | 59.5% | 11.1% |
| 15a. *Les jeunes gens qui font du sport sont plus heureuses | | 4.8% | 22.5% | 71.9% | 5.6% |
| 15b. Les jeunes gens qui font du sport sont plus heureux | | 95.2% | 0.0% | 87.5% | 12.5% |
| 24a. *De belles jeunes gens ont assisté au défilé de mode | | 15.5% | 22.5% | 65.5% | 12.0% |
| 24b. De beaux jeunes gens ont assisté au défilé de mode | | 84.5% | 23.1% | 57.7% | 19.2% |
| 6a. Ces jeunes gens sont heureux d’assister au concert de Beyoncé | | 95.8% | 28.6% | 57.1% | 14.3% |
| 6b. *Ces jeunes gens sont heureuses d’assister au concert de Beyoncé | | 4.2% | 18.0% | 78.9% | 3.1% |
| Causative | | | | | |
| 9a. Les marchandises que vous avez acheminé sont arrivées | | 72.6% | 28.3% | 69.6% | 2.2% |
| 9b. *Les marchandises que vous avez faites acheminé sont arrivées | | 27.4% | 9.0% | 79.5% | 11.5% |
| 18a. *Voilà la maison que nous avons faite construire à la campagne | | 35.7% | 4.6% | 79.6% | 15.7% |
| 18b. Voilà la maison que nous avons fait construire à la campagne | | 64.3% | 43.3% | 38.3% | 18.3% |
| 22a. *La voiture que j’ai faite réparer est encore au garage | | 23.8% | 7.0% | 78.9% | 14.1% |
| 22b. La voiture que j’ai fait réparer est encore au garage | | 76.2% | 55.0% | 32.5% | 12.5% |
| Epicène | | | | | |
| 10a. Ma cousine sera le tiers qui signera tous les documents | | 94.6% | 22.2% | 44.4% | 33.3% |
| 10b. *Ma cousine sera la tiers qui signera tous les documents | | 5.4% | 8.2% | 81.8% | 10.1% |
| 11a. *Son Excellence voudrait-il se reposer après ce long voyage? | | 16.1% | 25.5% | 62.4% | 12.1% |
| 11b. Son Excellence voudrait-elle se reposer après ce long voyage? | | 83.9% | 70.4% | 18.5% | 11.1% |
| 12a. Un homme politique peut être une vermine immonde | | 97.6% | 25.0% | 75.0% | 0.0% |
| 12b. *Un homme politique peut être un vermine immonde | | 2.4% | 0.0% | 97.6% | 2.4% |
| 17a. Cette milliardaire était un mécène merveilleux pour les arts | | 63.1% | 50.0% | 30.6% | 19.4% |
| 17b. *Cette milliardaire était une mécène merveilleuse pour les arts | | 36.9% | 24.5% | 47.2% | 28.3% |
| 19a. *J’ai consulté une femme merveilleuse, une sage bouddhiste au Tibet | | 58.9% | 33.3% | 44.9% | 21.7% |
| 19b. J’ai consulté une femme merveilleuse, un sage bouddhiste au Tibet | | 41.1% | 41.4% | 36.4% | 22.2% |
| 7a. *Votre fille est une prodige au piano, quelle merveille! | | 36.3% | 23.4% | 52.3% | 24.3% |
| 7b. Votre fille est un prodige au piano, quelle merveille! | | 63.7% | 49.2% | 47.5% | 3.3% |
| 9a. *Marie est une gourmet qui cuisine aussi à merveille | | 17.9% | 5.1% | 78.3% | 16.7% |
| 9b. Marie est un gourmet qui cuisine aussi à merveille | | 82.1% | 63.3% | 26.7% | 10.0% |

(Continued)
Epicene

| 19a. Ma cousine sera le tiers qui signera tous les documents | 94.6% | 22.2% | 55.6% | 22.2% |
| 19b. *Ma cousine sera la tiers qui signera tous les documents | 5.4% | 10.7% | 74.8% | 14.5% |

Amour

| 21a. Des amours si belles et romantiques ne se vivent qu’une seule fois! | 73.2% | 24.4% | 57.8% | 17.8% |
| 21b. *Des amours si beaux et romantiques ne se vivent qu’une seule fois! | 26.8% | 29.3% | 64.2% | 6.5% |

Amour

| 22A. Les amours italiennes de cet écrivain ont duré toute sa vie | 71.4% | 14.6% | 64.6% | 20.8% |
| 22B. *Les amours italiens de cet écrivain ont duré toute sa vie | 28.6% | 39.2% | 49.2% | 11.7% |

Past participle

| 20a. Prenez toutes les boîtes excepté celle-là | 67.3% | 20.0% | 61.8% | 18.2% |
| 20b. *Prenez toutes les boîtes exceptée celle-là | 32.7% | 11.5% | 67.3% | 21.2% |

| 8a. Passé la date officielle, aucune proposition ne sera acceptée | 66.1% | 26.3% | 59.6% | 14.0% |
| 8b. *Passée la date officielle, aucune proposition ne sera acceptée | 33.9% | 17.1% | 69.4% | 13.5% |

| 10a. Fermez toutes les valises excepté la noire | 76.2% | 21.7% | 67.4% | 10.9% |
| 10b. *Fermez toutes les valises exceptée la noire | 27.4% | 13.1% | 70.5% | 16.4% |

| 12a. Vu la manière dont il s’est comporté, je ne lui parlerai pas de sitôt! | 88.7% | 26.3% | 57.9% | 15.8% |
| 12b. *Vue la manière dont il s'est comporté, je ne lui parlerai pas de sitôt! | 11.3% | 4.0% | 79.2% | 16.8% |

| 20a. *Vues les erreurs qu’il a commises, il ne réussira jamais au concours | 13.7% | 4.1% | 86.2% | 9.7% |
| 20b. Vu les erreurs qu’il a commises, il ne réussira jamais au concours | 86.3% | 13.0% | 69.6% | 17.4% |

Orgue(s), Pâque(s), délice(s)

| 1a. J’ai admiré beaucoup d’orgues mais je ne savais pas lequel choisir | 73.8% | 20.5% | 63.6% | 15.9% |
| 1b. *J’ai admiré beaucoup d’orgues mais je ne savais pas laquelle choisir | 26.2% | 10.5% | 75.0% | 14.5% |

| 5a. Les calissons sont des délices aixoises | 19.6% | 2.2% | 74.8% | 23.0% |
| 5b. *Les calissons sont des délices aixois | 80.4% | 24.2% | 69.7% | 6.1% |

| 23a. Un bon petit rosé frais est toujours un vrai délice | 100% |
| 23b. *Un bon petit rosé frais est toujours une vraie délice | 0% | 3.6% | 93.5% | 3.0% |

| 2a. Quand Pâques sera fini, nous reprendrons le travail | 91.1% | 6.7% | 80.0% | 13.3% |
| 2b. Quand Pâques seront finies, nous reprendrons le travail | 8.9% | 18.3% | 66.0% | 15.7% |

| 3a. La Pâque juive est une des traditions les plus anciennes | 96.4% | 0.0% | 83.3% | 16.7% |

(Continued)
(Continued.)

| Organes, Pâque(s), délice(s) | Pref. | G   | U   | DK  |
|-----------------------------|-------|-----|-----|-----|
| 3b. *Le Pâque juif est une des traditions les plus anciennes* | 3.6%  | 0.6% | 93.2% | 6.2% |
| 4a. Les orgues de Flandres sont connues dans le monde entier | 64.3% | 10.0% | 86.7% | 3.3% |
| 4b. *Les orgues de Flandres sont connus dans le monde entier* | 35.7% | 12.0% | 82.4% | 5.6% |

| Combien | Pref. | G   | U   | DK  |
|---------|-------|-----|-----|-----|
| 11A. Ce sont de belles fleurs. Combien en avez-vous achetées? | 33.9% | 11.7% | 75.7% | 12.6% |
| 11B. Ce sont de belles fleurs. Combien en avez-vous acheté? | 66.1% | 8.8%  | 73.7% | 17.5% |
| 13A. Voilà toutes les cartes. Combien en a-t-il écrit? | 50.6% | 20.5% | 53.0% | 26.5% |
| 13B. Voilà toutes les cartes. Combien en a-t-il écrites? | 49.4% | 3.5%  | 92.9% | 3.5% |
| 15A. J'ai trouvé ces photos. Combien en avez-vous pris vous-même? | 48.2% | 18.4% | 56.3% | 25.3% |
| 15B. J'ai trouvé ces photos. Combien en avez-vous prises vous-même? | 51.8% | 25.9% | 71.6% | 2.5% |

| Reflexive verbs | Pref. | G   | U   | DK  |
|-----------------|-------|-----|-----|-----|
| 17a. Mes sœurs se sont toujours demandé pourquoi nos parents ont divorcé | 70.2% | 8.0%  | 78.0% | 14.0% |
| 17b. *Mes sœurs se sont toujours demandées pourquoi nos parents ont divorcé* | 29.8% | 0.8%  | 88.1% | 11.0% |
| 21A. *Ma belle-sœur s'est beaucoup amusé hier soir* | 12.5% | 0.0%  | 93.2% | 6.8% |
| 21B. Ma belle-sœur s'est beaucoup amusée hier soir. | 87.5% | 0.0%  | 100%  | 0.0% |
| 24A. *Les étudiantes se sont mises à courir en riant.* | 22.0% | 0.0%  | 81.7% | 18.3% |
| 24B. Les étudiantes se sont mises à courir en riant | 78.0% | 21.6% | 73.0% | 5.4% |
Appendix C Results from participants (n = 25) who obtained above 90% for CA on GJT

| participant | CA   | IR  | DK-C | CR   | IA   | DK-I |
|-------------|------|-----|------|------|------|------|
| 1           | 94.7%| 5.3%| 0.0% | 47.8%| 39.1%| 13.0%|
| 2           | 92.1%| 7.9%| 0.0% | 52.2%| 47.8%| 0.0% |
| 3           | 92.1%| 7.9%| 0.0% | 52.2%| 34.8%| 13.0%|
| 4           | 94.7%| 5.3%| 0.0% | 39.1%| 39.1%| 21.7%|
| 5           | 94.7%| 5.3%| 0.0% | 52.2%| 47.8%| 0.0% |
| 6           | 97.4%| 2.6%| 0.0% | 21.7%| 69.6%| 8.7% |
| 7           | 92.1%| 0.0%| 7.9% | 30.4%| 65.2%| 4.3% |
| 8           | 92.1%| 7.9%| 0.0% | 56.5%| 26.1%| 17.4%|
| 9           | 92.1%| 7.9%| 0.0% | 73.9%| 21.7%| 4.3% |
| 10          | 94.7%| 2.6%| 2.6% | 30.4%| 65.2%| 4.3% |
| 11          | 94.7%| 5.3%| 0.0% | 47.8%| 52.2%| 0.0% |
| 12          | 92.1%| 7.9%| 0.0% | 39.1%| 60.9%| 0.0% |
| 13          | 92.1%| 7.9%| 0.0% | 39.1%| 60.9%| 0.0% |
| 14          | 92.1%| 5.3%| 2.6% | 60.9%| 30.4%| 8.7% |
| 15          | 97.4%| 2.6%| 0.0% | 34.8%| 65.2%| 0.0% |
| 16          | 94.7%| 5.3%| 0.0% | 65.2%| 34.8%| 0.0% |
| 17          | 92.1%| 7.9%| 0.0% | 47.8%| 52.2%| 0.0% |
| 18          | 92.1%| 7.9%| 0.0% | 43.5%| 56.5%| 0.0% |
| 19          | 92.1%| 7.9%| 0.0% | 17.4%| 78.3%| 4.3% |
| 20          | 94.7%| 5.3%| 0.0% | 43.5%| 56.5%| 0.0% |
| 21          | 94.7%| 5.3%| 0.0% | 56.5%| 34.8%| 8.7% |
| 22          | 92.1%| 7.9%| 0.0% | 60.9%| 39.1%| 0.0% |
| 23          | 94.7%| 5.3%| 0.0% | 56.6%| 43.5%| 0.0% |
| 24          | 92.1%| 7.9%| 0.0% | 47.8%| 43.5%| 8.7% |
| 25          | 92.1%| 5.3%| 2.6% | 34.8%| 56.5%| 8.7% |
| One-way ANOVA          | Sum of Squares | df  | Mean Square | F     | Sig. | eta-squared |
|-----------------------|----------------|-----|-------------|-------|------|-------------|
| correctly accepted    |                |     |             |       |      |             |
| between groups        | 261.910        | 4   | 65.478      | 0.983 | 0.418| 0.024       |
| within groups         | 10852.018      | 163 | 66.577      |       |      |             |
| total                 | 11113.928      | 167 |             |       |      |             |
| incorrectly rejected  |                |     |             |       |      |             |
| between groups        | 157.821        | 4   | 39.455      | 0.742 | 0.565| 0.018       |
| within groups         | 8672.808       | 163 | 53.207      |       |      |             |
| total                 | 8830.629       | 167 |             |       |      |             |
| don’t know correct    |                |     |             |       |      |             |
| between groups        | 40.849         | 4   | 10.212      | 0.736 | 0.569| 0.018       |
| within groups         | 2263.225       | 163 | 13.885      |       |      |             |
| total                 | 2304.074       | 167 |             |       |      |             |
| incorrectly accepted  |                |     |             |       |      |             |
| between groups        | 2071.647       | 4   | 517.912     | 1.983 | 0.100| 0.046       |
| within groups         | 42578.186      | 163 | 261.216     |       |      |             |
| total                 | 44649.833      | 167 |             |       |      |             |
| correctly rejected    |                |     |             |       |      |             |
| between groups        | 2669.242       | 4   | 667.311     | 2.518 | 0.043| 0.058       |
| within groups         | 43199.873      | 163 | 265.030     |       |      |             |
| total                 | 45869.115      | 167 |             |       |      |             |
| don’t know incorrect  |                |     |             |       |      |             |
| between groups        | 66.413         | 4   | 16.603      | 0.495 | 0.740| 0.012       |
| within groups         | 5469.188       | 163 | 33.553      |       |      |             |
| total                 | 5535.602       | 167 |             |       |      |             |

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