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Orthographic control in relation to metalinguistic awareness: Studies in three different French-speaking contexts

Béatrice Akissi Boutin, Oreste Floquet, Pinto, Maria, Sist, Eleonora

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Orthographic control in relation to metalinguistic awareness: Studies in three different French-speaking contexts

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This study explores the relationship between metalinguistic awareness and orthographic control. A previous study on a French-speaking sample in Niamey (Niger) revealed an inverse correlation between the metalinguistic scores at an Acceptability task and the number of orthographic errors in the responses to that task. The authors put forward that orthographic control involves an implicit control over the relationship between the orthographic form of words and their meaning, which can be ascribed to an intuitive, ‘epilinguistic’ form of language awareness. The same design was then replicated with two more samples of French-speaking preadolescents of the same age range (11-14), one in Toulouse (France) and the other in Abidjan (Côte d’Ivoire). Considering the three samples together, the current study aimed at verifying: (a) whether the metalinguistic and orthographic performance varied as a function of geographical and sociolinguistic specificities; (b) to what extent the inverse correlations between orthographic errors and metalinguistic performance were confirmed on a broader sample. The results showed that the participants in Abidjan outperformed their peers in Niamey and Toulouse on both metalinguistic awareness and orthographic control grounds. The inverse correlation between metalinguistic performance and orthographic errors was fully confirmed on the whole sample.¹

KEYWORDS: metalinguistic awareness, epilinguistic awareness, orthographic control, French orthography.

1. *Orthographic control: social, educational and cognitive implications.*

The concept of metalinguistic awareness (MLA, henceforth), has been defined by linguists and psycholinguists in general terms, as a metacognitive activity applied to language structures by using language itself (for a review, Tunmer *et al.* 1984; James, 1999; Jessner, 2006; Pinto & El Euch, 2015; Cots & Garrett, 2018), and also in more circumscribed terms related to single language domains under the form of metasemantic, metagrammatical, metaphonological, metapragmatic, etc., awareness. (Tunmer *et al.* 1984; Gombert 1990; Bialystok 2001).

Many authors have stressed the influence of writing and reading on the very emergence of MLA (Donaldson 1978; Olson 1991, Bialystok 2001), and yet, to our knowledge, no link has been hypothesized between a salient aspect of writing skills, such as the mastery of orthographic rules, and MLA. The most common view, shared especially by L1 and foreign language teachers, is that orthographic control (OC, henceforth) basically involves the implementation of purely conventional rules that need to be known as such – and appropriately applied – rather than an ability that requires some awareness of the relationships between the phonological and the written form of a word and its meaning. The fact that OC implies at least an intuitive form of language awareness, some linguists call ‘epilinguistic’ (Culioli 1985, 1990; Gombert 1990; Ducard 2015; La Mantia 2017; Auguerre & Portine 2021)² particularly emerges when we have a doubt about the correct orthography of a given word in relation to the meaning and function of that word in a specific context. This happens especially with opaque orthographies, as in the French language, where there are many homophones, each matched to a different grapheme according to grammatical or semantic distinctions.

In French, as in any other language, orthography is connected to orality, which means that graphemes are associated to phonemes. However, French orthography also encodes a lot of information that is missing at a phonetic level, which highly solicits the writer’s interpreting capabilities (Seymour *et al.* 2003). This aspect makes the French graphic code sensibly different from that of other European languages, such as Italian, Spanish, German, and, to a smaller extent, English, and makes written French a more ‘difficult’ language to process and acquire (Fayol, 2003). For instance, the plural form of ‘ami’ ‘friend’, ‘amis’, is pronounced the same way as the singular form: [ami]. Likewise, homophones such as ‘sang, cent, s’en’ are all pronounced the same way, i.e. [sã]). This specificity of the French orthography requires considerable effort to any learner of French, either native speaker or foreign language learner (Guyon 1997; Vaca Uribe 2003), and thus represents a developmental, educational, and social challenge at the same time. In developmental psychology, for instance, there still is an ongoing debate about the existence of relatively fixed stages in the acquisition of orthographic rules. For some authors, phonological and orthographic processing appear to go hand in hand rather than separately, while other researchers prefer a parallel approach (Sprenger-Charolles *et al.* 1998, 2003; Bousquet *et al.* 1999; Martinet *et al.* 1999; Jaffré & Fayol 2016). On the linguistic side, several typologies of orthographic errors have been proposed, although these are

all fundamentally based on a graphematic distinction between grammatical (e.g. <elle mangent> instead of <elle mange>), lexical (e.g. <tim> ‘tim’ for <thym> ‘thyme’), or phonetic errors (e.g. <reponse> for <réponse>), which, in turn, is grounded on the distinction between morphogrammes, logogrammes, and phonogrammes (Dubois *et al.* 1970; Katoozian 2014; Fayol & Jaffré 2016).

On the psycholinguistic side, since Simon’s study (1952), some authors have considered the possible factors that may account for orthographic errors in French-speaking children, especially at primary school level, such as reading difficulties (insufficient fluency in the linear, left-to-right representation of the text), or perceptual difficulties (bad reproduction of sounds, prosody, and rhythms), or linguistic and metalinguistics difficulties (unawareness of the noun/verb distinction and consequent incorrect orthography of both). Most of the recent psycholinguistic studies on orthographic errors focus on developmental factors or on links between OC, on the one hand, and writing/reading learning, on the other. The major factors influencing the early stages of acquisition of the written code appear to be frequency, consistency and analogy (Martinet *et al.* 2004; Lété *et al.* 2008; Pacton & Afonso-Jaco 2005). Importantly, OC is also associated with deeply rooted social values, acting both positively and negatively. The ability to master orthography is socially represented as a key to access employment and citizenship, a founding stone of social cohesion and self-celebration of a nation which represents itself as built upon a consistent system of norms (Wynants 1996; Cibois 1999). Conversely, the failure in developing such a crucial ability exposes the individual to social selectiveness and discrimination, to the point that a curriculum vitae with orthographic errors may seriously penalize the individual who applies for a job (Behaghel *et al.* 2011; Jacquemet 2013).

The rationale of the classification of orthographic errors can potentially influence the way these are assessed at school in correlation with more or less developed MLA. In a recent study on a French-speaking sample of pupils at ‘Collège’ level³ in Niamey (Niger), Floquet & Pinto (2019) proposed an innovative classification of French orthographic errors, based on a cognitive factor. The authors pointed to a basic distinction between errors due to confusion between different parts of speech (adjective *vs* verbs, verbs *vs* nouns, etc.), which consequently upset form and meaning in a sentence, and errors which only alter the form of those parts without consequences on meaning. The former have been called ‘categorical errors’ because, in the authors’ words, they violate “the borders between categories of words” (Floquet & Pinto 2019: 3), as can be seen in the following examples: <c’est>

instead of ⟨ses⟩, ⟨il ne peut pas jouait⟩ instead of ⟨il ne peut pas jouer⟩⁴ or ⟨son entrain⟩ instead of ⟨sont en train⟩. The other type of errors, instead, have been called ‘non categorical’ because they do not entail a metamorphosis of one category into another. To write ⟨pasage⟩ instead of ⟨passage⟩, or ⟨different⟩ instead of ⟨différent⟩, ⟨riponse⟩ instead of ⟨réponse⟩, ⟨chevaus⟩ instead of ⟨chevaux⟩ does not alter the category to which these words belong – nouns or adjectives, in this case – nor their meaning. In addition, the incorrect orthography of these words does not disrupt neither the grammatical nor the semantic relationships between the other words in a sentence.

The authors put forward the hypothesis that categorical errors might be due to absent or confused awareness of the units of language. This imperfect awareness of linguistic units can be considered an expression of the ‘analysis’ component of Bialystok’s (2001) psycholinguistic model of metalinguistic development. According to Bialystok (2001), from the earliest oral skills up to more abstract metalinguistic abilities, children develop an analytical linguistic ability that allows them to represent the units of language, in form and content, and becomes more and more focused and precise. In the Floquet & Pinto’s (2019) study, an inverse correlation was found between orthographic errors and MLA, as assessed by a French Acceptability task. In other words, the higher the MLA scores, the lower the number of orthographic errors. According to the authors, this outcome supports the idea that orthographic errors do not simply reveal an incorrect application of purely arbitrary rules but rather an imperfect awareness of the categories of words to which these rules apply.

Based on the framework and methodology by Floquet & Pinto (2019), the present study replicated the same research design with two further samples of French-speaking children of the same age, enrolled in the same grades of the French school system, one located in Europe (Toulouse, France) and the other in Africa (Abidjan, Côte d’Ivoire). As geographical contexts are associated to sociolinguistic variations even in the same language, French in this case, our investigation aimed at verifying: (a) whether the epilinguistic and metalinguistic performance, as assessed by an Acceptability task, and the orthographic performance in this same task varied in relation to differences in geographical and sociolinguistic contexts; (b) to what extent the pattern of inverse correlations between orthographic errors and metalinguistic performance in the Acceptability task, found in the Floquet & Pinto’s (2019) study, could be generalized to a wider and diversified sample of French-speaking contexts.

2. The sociolinguistic and educational contexts of the study

In this paragraph, we will briefly outline some major sociolinguistic features of the three French-speaking contexts of our study, with a particular focus on the status of French and the characteristics of the educational system related to teaching the French language. Toulouse, Niamey and Abidjan are very different French-speaking metropolises. Toulouse is a dynamic city in the South-West of France, with 1,300,000 inhabitants (including the whole urban area), as of 2017. French is the official language of the whole French territory, the native language of the vast majority of its inhabitants, and the exclusive vehicular language of the school system at all levels. Although there is a lively movement in favor of French-Occitan bilingualism, visible in some aspects of ordinary daily communication, such as street names or monument plaques, and although 25% of the families declare to speak other languages, French is by far dominant (Couëtoux-Jungman & Extramiana 2010).

Niamey, Niger's capital city, is a metropolis with about the same number of inhabitants as Toulouse where all the Nigerien populations are represented, and ten Nigerien languages, acknowledged at national level, are spoken. International languages such as American English or Chinese are also spoken in business circles. Since the colonial conquest, French has been the official language in Niger, regarded as the only legitimate one in formal and academic situations, although it is spoken by less than 25% of the population. However, as a part of the population does not understand French, Nigerien languages are largely preferred in the family as well as in all informal interactions (Beidou 2014).

Abidjan, the largest city of Côte d'Ivoire, the third country of our study, also has French as its official language. It is a metropolis of 6 million inhabitants where French is widely spread in all social situations, both formal and informal, and has an excellent status (Chaudenson *et al.* 1993). Although a great part of the population is French monolingual in every professional milieu, all Ivorian languages and many other languages are also spoken, due to intense internal and external migrations (Boutin & Kouadio 2016). According to the social contexts and circles, two vehicular languages, namely Jula and Baule, can be used in addition to more than sixty other languages of the Côte d'Ivoire.

At an educational level, the common thread uniting the three contexts of our study is the fact that the three school grades involved share the same denomination and the same age range. In addition, some attempts at modernizing the teaching of French, orthography in particular,⁵ have been implemented in all French-speaking countries, including the African countries of the present study. Nevertheless, we

must point out two major differences between African and European situations. The first has to do with teacher training in Africa, which takes place in contexts that are considerably different from the European ones, from the anthropological, linguistic and political points of view (Puren & Maurer 2018). The second is related to the different modalities of acquiring French as a vehicular and official language. While French is the mother tongue for a child born in Toulouse, a child born in Niamey is scarcely exposed to it before entering school, as opposed to a child born in Abidjan, who will grow up in a context where French is omnipresent even before school age and co-exists with several other languages, especially in urban contexts. However, we must note that a study on the epi- and metalinguistic abilities and self-confidence in French, carried out with two groups of adolescents in Abidjan and Niamey (Boutin & Floquet 2020), showed that, beyond their real competence, these subjects never felt insecure towards the possibility of making acceptability judgments upon French utterances, differently from other subjects who were simply learners of French as a foreign language. Also, in all three French-speaking countries, the language spoken and written at school is sensibly different from the oral language used with peers and family members, as everywhere in French-speaking areas. In Côte d'Ivoire, in particular, even in the classroom there is a constant shifting from standard to Ivorian French, whose features have been extensively studied (Kouadio 1999; Boutin 2002). It often happens that, after giving explanations with the characteristic stylistic modalities of academic French, teachers later rephrase these same explanations in Ivorian French (Kouamé 2013; Djé 2018).

3. Method

3.1 Participants

A total sample of 118 children participated in this study, subdivided into three subsamples, one tested in Toulouse (France; T sample, henceforth; N = 60), one in Niamey (Niger; N sample, henceforth; N = 28), and one in Abidjan (Côte d'Ivoire; A sample, henceforth; N = 30). Each subsample, in turn, was composed of children enrolled in 6^{ème}, 5^{ème} and 4^{ème}, according to the French denomination,⁶ with the following mean ages in each grade (T sample: 6^{ème}: 11.7 y.; 5^{ème}: 12.8; 4^{ème}: 13.8; N sample: 6^{ème}: 11.6 y.; 5^{ème}: 12.8 y.; 4^{ème}: 13.6 y.; A sample: 6^{ème}: 11.5 y.; 5^{ème}: 12.6 y.; 4^{ème}: 13. 6). These grades match 7, 8 and 9 years, respectively, of written French education in Abidjan and Niamey, and 6, 7 and

8 years of written French education in Toulouse. In the three subsamples, gender distribution ranged from relatively balanced in Toulouse (F = 36; M = 24), and Abidjan (F = 13; M = 16), to unbalanced in Niamey, where all the participants were males, due to the cultural characteristics of the school they were enrolled in.

In Toulouse, the context of the study was a suburb where the family background ranged from low-average to middle class. The only school present in that suburb included adolescents of all family backgrounds and its objectives perfectly matched those formulated by the French National Education, namely social mix, support for students with learning difficulties, and secularism in teaching. The number of students per class ranged from 30 to 33, with a total number of 800 students in the whole school. The percentage of achievement at the BEPC⁷ was high, although slightly lower than the national mean (85% vs 90%).

In Abidjan, the study took place in a school where the sociocultural background of families ranged from average to middle class. The school was founded by a parents' association aiming at promoting family cohesion, solid human and intellectual formation, solidarity and social integration. The number of students per class was approximately 20 with a total number of 300 students in the whole school. The students' education was reinforced by a personalized follow-up. The percentage of achievement at the BEPC was 100%, higher than the national one (from 60% to 53% in the years 2017-2020).

The school in Niamey was founded under the aegis of a Catholic mission. The sociocultural background of the families ranged from low-average to middle class. The educational project highly stimulated reflectiveness, participation and regular monitoring of learning, and aimed at reaching excellent academic achievement. The number of students per class was about 60 in 6^{ème} and 5^{ème} and 30 in 4^{ème} and 3^{ème}, for a total number of students of 420 in the whole school. The percentage of achievement at the BEPC ranged between 90% and 97%, much higher than the national mean (between 26% and 46% between 2013 and 2016).

All the participants in the T, N and A groups had French as their first language or as a language learned at preschool age, but with differences between the three subsamples. Nearly all the children in the T and the A samples were French monolinguals, although partially competent in some foreign language or in other languages spoken in the family. The N sample was entirely constituted by bilinguals, with French in alternation with some local language (Songhay-Zarma or Hausa). For the subsamples in Africa, French was the language best known at written level. None of the children had neurological deficits nor learning

disabilities. Their academic achievement, as assessed in mathematics and French, ranged from acceptable to good, according to the teachers' assessment.

3.2 Instruments and measures

THE METALINGUISTIC TASK

To study MLA, we chose a subtest drawn from the *Test d'Habilités Métalinguistiques n. 2*; 9-14 y. ('Metalinguistic Ability Test n. 2' – Pinto & El Euch 2015; THAM-2, in acronym), namely, Acceptability. The THAM-2 results from the translation-adaptation into French of the original Italian version (Pinto 1999), validated on an Italian-speaking population (Pinto *et al.* 2003). In view of a future validation of the test on French-speaking samples, data collection has already started, although incomplete at the moment.⁸

The theoretical construct of the THAM-2 is based on the distinction between two levels of MLA, one which is implicit and intuitive, and the other explicit, analytical and intentional. In the test, these two levels are embodied in two different types of questions and answers, called 'linguistic' and 'metalinguistic', respectively. A first question addresses a basic issue in each item of a given task, in very general terms: same or different meaning of two sentences, grammatical or semantic acceptability or non acceptability of a sentence, etc. This type of question is called 'linguistic' (acronym: L) because it requires to retrieve basic rules and/or language conventions in order to provide the right solution to the alternative presented: correct/incorrect, presence or absence of a given linguistic unit. The ability to respond adequately to such questions requires merely intuitive and global levels of reflectiveness on the issue at hand, rather than particularly focused or analytical processes. Instead, when the request is to explain the grounds of this yes/no, correct/incorrect, presence/absence answer, the respondent must analyze the presence, meaning and position of certain language units, and check the consistency of these units in the item. In addition to phonological, lexical, grammatical, and pragmatic knowledge, this type of analysis requires selective attention on the linguistic units that are decisive to the solution, and a consistent rephrasing of the sentence. The request for explanation is called 'metalinguistic' (acronym: ML) because it calls upon an in-depth reflection on the features of language, using language itself to argue about its structures. In this case, reflectiveness cannot be but intentional and involves higher-order cognitive processes, much more demanding than at the L level. Among the six THAM-2 subtests, Acceptability has been chosen

for its balance between semantic and grammatical issues. In half of the items, participants are requested to judge if a given sentence is acceptable or not on semantic grounds, due to some incongruous association between words (i.e. ‘the rope played with the cat’ vs ‘the little girl played with the rope’), while in the second half, they have to judge if a given sentence is well formed or not, due to some grammatical error (i.e. ‘supper are bad today’). In both cases, participants are requested to state, at the L level: (a) if the sentence is acceptable or not; (b) if it is unacceptable, where the error is; (c) how this error should be corrected. At the ML level, they must point out the reasons for the acceptability or unacceptability.

SCORING

The scoring system reflects the above distinction by assigning 1 or 0 to a satisfactory or unsatisfactory response at the L question, and 0, 1 or 2 to responses at the ML level, based on elaborateness. ML analysis can be totally absent (score: 0), partially developed but still insufficient (score: 1), exhaustively and consistently developed (score: 2). Total L score: 28; Total ML score: 26.

ORTHOGRAPHIC CODING SYSTEM

To assess orthographic errors we used the same coding system as in the Floquet & Pinto’s (2019) study in which the basic distinction is between errors due to confusion between parts of speech (adjective vs verbs, verbs vs nouns, etc.), which consequently upsets form and meaning in a sentence, and errors which only alter the form of those parts without consequences on meaning.

Categorical errors: any error deriving from the confusion between one part of speech and another: verb instead of noun, adjective instead of verb, type of verbal form instead of another, etc., but also distinctions within the same category, i.e. confusion between different verb moods or different verb tenses. The confusion may arise from bad segmentation or inadequate agglutination (see examples in the Introduction).

Non categorical errors: any error without consequences on the identification of parts of speech and their meaning, i.e. added or missing consonants or vowels; improper consonants or vowels which do not alter the recognition of the word in question, missing accents without consequences for the identification of the word (see examples in the Introduction).

Total number of errors, categorical and non categorical.

Total errors / total number of words: ratio of errors of all types in relation to the total production of words in each test protocol.

Total categorical errors / total number of words: ratio of the categorical errors in relation to the total production of words in each test protocol.

SCORING

For each category, scores are cumulative. Single categories of errors are computed separately and then related to the total amount of words produced in each Acceptability protocol.

PROCEDURES

Each subsample was tested in its habitual classroom by an examiner trained in the administration and coding of the Acceptability task chosen for this study. The testing lasted one hour, following the time limits indicated in the manual (Pinto & El Euch 2015). In all three contexts, children obtained their parents' consent after the teachers had explained the aims of the testing as a part of a "broader investigation on language abilities in French-speaking pupils" implemented by a team of European researchers. The N sample was first tested, and a few months later the A and the T subsamples were tested in parallel. In each subsample, the protocols have been coded by two independent raters for both the ordinary scoring procedure of the THAM-2 and the orthographic errors. The percentage of agreement for the L scores, precoded in the manual (Pinto & El Euch 2015), was 100%, while for the ML scores, based on open questions, it was 91%, and for the orthographic errors it was 99%.

4. Results

In relation to our first aim, that was to compare the three subsamples against all the measure (L and ML scores and orthographic errors), we calculated means and standard deviations and applied a one-factor (type of context) ANOVA. The results, reported in Table 1, showed significant differences in all measures.

MEASURES	F	P
Tot W.	28.4077	0.0001
Cat. Err.	8.0036	0.0006
Non Cat. Err.	2.3854	0.0966
Tot Err.	6.1672	0.0029

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Tot Err./Tot W.	6.3534	0.0024
Tot Cat./Tot W.	3.7897	0.0255
L	17.3095	0.0001
ML	16.2152	0.0001.

Table 1. Results of the one factor (type of context) ANOVA on all the OC and MLA measures. Whole sample.

Legend. Tot W.: total number of words; Cat. Err.: Total number of categorical errors; Non Cat. Err.: Total number of non categorical errors; Tot Err.: Total number of errors; Tot Err. / Tot W.: Total number of errors in relation to the total number of words; Tot Cat. / Tot W.: Total number of categorical errors in relation to the total number of words; L: THAM-2 Linguistic scores; ML: THAM-2 Metalinguistic scores.

The post-hoc Duncan test (Table 2) showed a significant superiority of the A subsample over both the N and T subsamples in all measures. In some cases (Tot W., Cat. Err., L, ML) there was an equally significant gap between each subsample while, in others, the gap was significant only between the A and the N subsamples (Non Cat. Err.) or between the A and the T subsamples (Tot Cat./Tot W.) or between the A subsample, on the one hand, and the N and T subsamples, on the other (Tot Err.; Tor Err./Tot W.).

MEASURES	SUBSAMPLES	P	SUBSAMPLES	P	SUBSAMPLES	P
Tot W.	A vs N	0.0012	A vs T	0.0000	N vs T	0.0005
Cat. Err.	A vs N	0.0000	A vs T	0.0346	T vs N	0.0263
L	A vs N	0.0000	A vs T	0.0113	T vs N	0.0003
ML	A vs N	0.0000	A vs T	0.0076	T vs N	0.0007
Tot Err.	A vs N	0.0003	A vs T	0.0304		
Tor Err./Tot W.	A vs N	0.0003	A vs T	0.0211		
Non Cat. Err.	A vs N	0.0412				
Tot Cat./Tot W.	A vs T	0.0183				

Table 2. Significant gaps between subsamples at Duncan post-hoc test.

At the descriptive level, means and standard deviations reported in Table 3 show that children in Abidjan produced a greater number of words, obtained better L and ML scores, made less categorical and non categorical orthographic errors, and, consequently, had a lesser number of total errors, a smaller ratio of errors in relation to the total number of words, and, in particular, of categorical errors in relation to the total number of words. In the whole, in Abidjan, the Acceptability protocols were not only better on epi- and metalinguistic grounds for the quality of the responses, but also for all what concerned orthography and word

production. The T subsample occupied an intermediate position between the A and the N subsamples, to the exception of word production and ratio between categorical errors and total words, where the N subsample performed slightly better. In Niamey, children showed the lowest performance in both L and ML scores, the highest number of categorical, non categorical and total errors, and the highest ratio between total number of errors and total number of words.

Despite these differences, there were also some similarities in all subsamples. First, all the children completed the task in time, although, as reported by their teachers, they were not accustomed to respond to the type of questions posed by the task at such an explicit and argued level, and in written form. Occasionally, and in each context, the children would express doubts about the meaning of specific words (which the examiner was not allowed to clarify) but never called into question the testing *per se*. In terms of performance, we could observe a common trend in the three subsamples, i.e. a marked gap between the L and the ML performances, which matches the pattern found in all the studies conducted on the complete THAM-2, in all linguistic versions (Pinto *et al.* 2003; Jessner *et al.* 2015; Couceiro Figueira *et al.* 2019), as well as in the Niamey study. Even when the L score approached the ceiling, as in the A subsample (27.13 vs 28), the ML score was far from the maximum (14.46 vs 26). In the T and N samples, where the L scores were lower, the ML were less than half of the maximum (T subsample: 11.25 vs 26; N subsample: 7.10 vs 26)

	TOT W.	CAT. ERR.	NON CAT. ERR.	TOT ERR.	TOT ERR./ TOT W.	TOT CAT./ TOT W.	L (28)	ML (26)
	M (s.d.)	M (s.d.)	M (s.d.)	M (s.d.)	M (s.d.)		M (s.d.)	M (s.d.)
T	216.8814 (79.5441)	7.9322 (7.5056)	4.1695 (6.9163)	12.0847 (13.3204)	0.0562 (0.0524)	0.0891 (0.1766)	25.0 (3.4396)	11.2542 (5.3917)
N	284.0714 (72.579)	11.96 (9.12)	4.71 (4.58)	16.6786 (12.1979)	0.0807 (0.111)	0.0447 (0.0344)	21.8214 (4.6984)	7.1071 (4.304)
A	346.5333 (76.0595)	4.1 (4.9217)	1.8 (2.4138)	5.9 (6.2629)	0.0182 (0.0234)	0.0121 (0.0121)	27.1333 (1.2579)	14.4667 (4.2248)

Table 3. Means and standard deviations (in brackets) for orthographic errors, L and ML scores in T, N and A subsamples. L and ML scores in brackets.

In relation to our second aim, that was to verify the hypothesis of an inverse relationship between epi- and metalinguistic abilities and orthographic errors, we applied the Pearson correlation coefficient ($p < .05$) to all measures in the total sample. The outcomes (Table 4) showed a consistent picture of both positive and negative correlations. On the one hand, indicators of good performance such as the L and ML scores and the number of total words were positively correlated, as were also the L and ML scores, in conformity with the factorial structure of the test (Pinto *et al.* 2003). Indicators of bad performance, as expressed by errors and ratios between errors and number of words, were also positively correlated. On the other hand, as expected, L and ML scores were negatively correlated to all the error categories and also to the total errors / word production ratio. It is worthy to note that the extent to which this inverse correlation applied proved even greater than in the Floquet & Pinto's (2019) study, where 6 out of the 10 possible correlations were significant (L and ML scores vs Categorical errors, Non categorical errors, Total errors, Total errors/Total Words Ratio, Categorical errors/Total Words Ratio). When considering all three subsamples together, instead, these inverse correlations applied to 8 out of 10 possible cases. The only exception was the correlation between L and ML scores and the Categorical errors/Total Words Ratio, which was also inverse but not significant.

	TOT W.	CAT. ERR.	NON CAT. ERR.	TOT ERR.	TOT ERR./TOT W.	TOT CAT. ERR./TOT W.	L
Cat. Err.	0.0195	-					
Non Cat. Err.	0.1027	0.6227	-				
Tot Err.	0.0608	0.9325	0.8631	-			
Tot Err./Tot W.	-0.1341	0.6614	0.4807	0.6485	-		
Cat. Err./W.	-0.3652	0.1085	0.0818	0.1080	0.1543	-	
L	0.1966	-0.3779	-0.3296	-0.3949	-0.02371	-0.1429	-
ML	0.4015	-0.3401	-0.1785	0.3021	-0.3603	-0.1705	0.5389

Table 4. Correlations (Pearson's coefficient; $p < .05$) between all types of orthographic, measures, L and ML scores. Total sample. Numbers in bold denote significant correlations.

5. Discussion

In this research, we studied a complex metalinguistic ability, which requires to judge and justify the acceptability of sentences, in three French-speaking samples of children in the age range 11-14, located in two different continents: Toulouse (France, T subsample), Abidjan (Côte d'Ivoire, A subsample), Niamey (Niger, N subsample). The study was an extension of a previous investigation conducted in Niamey (Floquet & Pinto 2019) where acceptability was assessed with the Acceptability task of the French THAM-2 (Pinto & El Euch 2015). This task assesses MLA at two levels of depth: epilinguistic, with L scores, and metalinguistic, with ML scores. For the first time, in the abovementioned study the responses were analyzed also from the orthographic point of view, and it was hypothesized that there was an inverse relationship between MLA, as expressed by both L and ML scores, and the number and type of errors in the written responses to the task. In this perspective, errors were regarded as an expression of insufficient awareness of the units of language, although at different depth, depending on how the errors affect meaning. In principle, then, insufficient awareness of orthographic rules in the written responses to the task should have been negatively correlated to adequate awareness of the semantic and grammatical issues posed by the task itself. This was precisely what had emerged in the Floquet & Pinto's (2019) study: the lower the L and ML scores in Acceptability, the higher the number of orthographic errors in the responses to the task, and vice-versa.

The present study aimed at checking the consistency of the results found in Niamey on a larger, comprehensive sample. To this end, we set out two main objectives: (a) comparing the three subsamples on all the measures related to the Acceptability task, in order to see possible differences in performance; (b) calculating the correlations between L and ML scores, and orthographic errors, to confirm or disconfirm the expected inverse correlation on a larger scale.

The comparison, by means of a one-factor ANOVA, revealed significant differences in all the measures of the Acceptability task, L, ML scores and orthographic errors, in favor of the A subsample which outperformed the other two subsamples, especially the N one. The A and the N subsamples, both located in West Africa, represented the best and the worst performances of the total sample, respectively, on all measures. In Abidjan, on epilinguistic and metalinguistic grounds, the L mean score nearly approached the maximum, and the ML mean score was above half the maximum, while, in Niamey, the mean L score reached two thirds of the maximum and the mean ML score was half of that in

Abidjan. In all the scores regarding orthographic errors and their relation to the total word production, the extent of the gap was similarly relevant.

Two main factors may be invoked to explain the respective positions of the subsamples, with Abidjan at the highest level, Niamey at the lowest, and Toulouse at the intermediate: one at macro-sociolinguistic level, associated with the status of French in each country, and the other at local level, associated with the educational characteristics of each school. Although French is the vehicular language in the schools of each context, on a national scale this language plays a different role, and is differently appropriated by the respective populations (see Participants section). In Niamey, difficulties in attaining a satisfactory and generalized competence in French have always been a concern at political level, in spite of recurrent reforms. Sita (*unpublished*) outlines three different possible causes to account for the unsatisfactory achievement of French in the population: negative social representation of French, negative perception of personal competence by students, and insufficient use of French in students' environments. It is therefore highly plausible that students at Junior High School level in Niamey have not yet acquired sufficient linguistic competence in French, and are consequently weak also at metalinguistic level. In Abidjan, and Côte d'Ivoire in general, French is never called into question as the official language, and is totally appropriated by the population, in spite of all the attempts to accredit an Ivorian variety at mainstream level. At local level, the higher results obtained in Abidjan versus Niamey and Toulouse could be partially due to a significantly smaller number of students per classroom (20 vs 30-33 in Toulouse and 42-62 in Niamey), and the presence of personalized tutoring, aimed at establishing links between disciplines by exploiting the transversal character of French, a factor which intrinsically promotes reflectiveness about language (Ouindé 2016). Although the school in Niamey also includes a similar type of tutoring, the high pupil density in the classrooms, combined with the weaknesses related to the status of French at macro-sociolinguistic level, override the positive influence of such pedagogical efforts. In the school in Toulouse, no such tutoring exists at all. The educational project of each school, and its implementation in material conditions must have played a major role on the performance on the THAM-2.

The expected inverse relationship between epi- and metalinguistic capabilities, on the one hand, and orthographic errors, on the other, was fully confirmed. This outcome seems all the most significant as it appeared beyond differences in the quality of performance, which means

that irrespective of the overall performance of each group, and beyond geographical and cultural distances, the higher the metalinguistic level, the lower the number of orthographic errors. In addition, the result was confirmed even more consistently than in the first study in Niamey, as negative correlations between L and ML scores and orthographic errors were found in more cases. This result seems to support the conceptual link between metagrammatical and metasemantic awareness, on the one hand, and OC, on the other, that had been first formulated in the Floquet & Pinto's (2019) study.

6. Conclusion

We believe this study offers promising elements at both theoretical and socio-educational level. At theoretical level, it suggests a different view of OC as one of the many facets of MLA when reflection operates on written language, and not merely as the application of conventional rules. Good spelling can be transformed into an object of reflection on its own, inasmuch as it is always connected with metasemantic, metagrammatical, metaphonological and metapragmatic reflection. Control over spelling goes beyond ('meta') the knowledge of basic orthographic conventions because, to be sure of the appropriate orthographic form, one must reason about the consistency of this form in relation to those words that are morphologically, semantically, and grammatically related in a sentence. This reasoning can operate at a more or less conscious level, most of the time intuitive and therefore epilinguistic but it can be brought to the surface by explicit questions we can ask ourselves or others can address us. In the Introduction we stressed the fact that doubts and reasonments on spelling are amplified in the case of opaque orthographies, of which French language is an emblematic example, because of the plurality of possible written forms matching the same sound.

This metacognitive view of OC, in turn, opens a series of possibilities for teachers who believe in the educational value of MLA. We already know of several educational experiences aimed at enhancing MLA, which seems to be a predictor of relevant abilities such as paraphrasing, text composition, study method, general school achievement, second and additional languages learning (Spellerberger 2015; < www.matelproject.com >). An entire European Longlife Learning Project, called MATEL ('Metalinguistic Awareness Tests in European Languages') has been devoted to the educational applications of MLA to several disciplines, from mathematics, to history, geography, social sciences, at various academic levels, from Junior High School to University, and in several European

languages. If it is possible to bring students to give arguments about the reasons for considering sentences more or less acceptable, synonymous or ambiguous, as we know it is possible through the THAM-2 subtests, it is also possible to have the same students reflect about the consistency or inconsistency of their spelling. Gross categorical errors, as in the abovementioned *il ne peut pas jouait* example, where logical associations between meanings are clearly violated, offer students credible examples to realize that these associations are semantically incompatible. Series of such exercises can be organized and practiced in order to sensitize students to the relevance of orthographic forms in relation with a speaker's intended meaning. In French-speaking contexts, where OC is an attested socio-educational issue, coping with this issue through consciousness-raising trainings could represent a viable proposal.

At the same time, our study presents some limitations which future investigation should address. First, in the absence of the validation of the Acceptability task, with standard age references and precise item-analysis, intergroup comparisons can only be handled cautiously, and in very general terms. Secondly, the inverse correlation between L and ML scores and orthographic errors was found for all types of errors, irrespective of the categorical/non categorical distinction, which suggests that OC is always subject to metacognitive attention, although at varying degrees of consciousness. On the other hand, the pervasive character of this correlation seems to confirm all the more the metalinguistic nature of OC. A detailed study of the most recurrent errors, especially those that have more impact on meaning, i.e. the categorical ones, and their correlations with L and ML responses should be studied more in detail. In addition, other metalinguistic tasks, belonging to the same THAM-2 battery (Pinto & El Euch 2015), could be used in order to check if the same inverse correlation pattern is confirmed. Finally, the research design of this study should be replicated with other samples of monolingual native French-speaking children, and bi/plurilingual children having French as their first language, in France and other parts of the world, to further explore the relationship between MLA and OC in the French language. The outcomes could as well inspire research on other languages with opaque orthographies.

Abbreviations

A = Abidjan (Côte d'Ivoire); L = 'linguistic' (vs 'metalinguistic'); ML = 'metalinguistic' (vs 'linguistic'); MLA = metalinguistic awareness; N = Niamey (Niger); OC = orthographic control; T = Toulouse (France); THAM-2 = Test d'Habilités Métalinguistiques n. 2.

Notes

¹ This paper is the product of a joint collaboration as follows. Conceptualization: Boutin, Floquet, Pinto; Data collection and coding: Boutin, Floquet, Pinto, Sist; Statistic processing: Pinto; Writing and supervision: Boutin, Floquet, Pinto. We would like to express our gratitude to the two anonymous reviewers for their detailed comments.

² The term ‘epilinguistic’ has been coined by Culioli (1985, 1990) to refer to an intuitive and incipient form of awareness of language, distinct from an articulated and deliberate metalinguistic analysis of language. The term, and the underlying notion, has been adopted mainly by French-speaking researchers, inspiring psycholinguistic research, both theoretical and empirical, especially among developmentalists (Berthoud-Papandropoulou *et al.* 1989; Gombert, 1990, 1996; Bronckart *et al.* 2015) and a lively, current debate in linguistics (Canut 2000; Culioli & Normand 2005; Filippi-Deswelle 2012; Ducard 2015; La Mantia 2017; Auguerre & Portine 2021). Actually, while the initial definition appeared as problematic and even contradictory (epilinguistic is a “unconscious metalinguistic activity”, Culioli 1999: 19), later on, Culioli himself (Culioli & Normand 2005) revisited it in order to better distinguish between minimal forms of intentionality and consciousness, such as online feedback on aspects of one’s own utterances, and explicit analyses of language in general, similar to those implemented by linguists. As Franckel (2021: 177) convincingly puts it, “the distinction between epilinguistic activity and metalinguistic analysis goes hand in hand with the articulation between the speaker’s rationality and the linguist’s rationality” (our translation). Rethinking the epi-metalinguistic distinction also implies to acknowledge that, in real life, there are many, more or less focused, degrees of language awareness, and constant transitions between these levels, as sharply pointed out by Ducard (2015). In our paper, for methodological reasons associated with the type of task we used, based on judgments of acceptability, we adopted a more clear-cut position (see Method, Instruments).

³ In the French school system the ‘Collège’ level approximately corresponds to Junior High School.

⁴ This error affects both the mood (indicative instead of infinitive) and the tense (past instead of present), which, in turn, upsets the semantic and syntactic relationships between the two verbs.

⁵ See the 1990 Reform, called ‘Les rectifications de l’orthographe’.

⁶ This denomination approximately corresponds to grades 1, 2 and 3 of secondary school.

⁷ Certificate of the first stage of secondary education in France.

⁸ The THAM-2 also exists in other languages: English, since 1999 (Pinto *et al.* 1999), Spanish since 2000 (Pinto *et al.* 2000), German, since 2015 (Jessner *et al.* 2015; 4 subtests out of 6), Russian, since 2016 (Veggetti 2016, <www.pintomatel.com>), Portuguese, since 2018 (Couceiro Figueira & Pinto 2018). To date, only the Spanish version has been validated, thanks to the European LLP Project MATEL (<www.pintomatel.com>).

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