

# On accessible language testing for students with disabilities

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Citation: Cardinaletti, Anna (2021) "On accessible language testing for students with disabilities", in Monica Masperi, Cristiana Cervini, Yves Bardière (eds.) *Évaluation des acquisitions langagières : du formatif au certificatif*, mediAzioni 32: A32-A53, <http://www.mediazioni.sitlec.unibo.it>, ISSN 1974-4382.

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## 1. Introduction

The aim of the paper is to discuss the accessibility of language tests, in particular for students who have sensory (deaf) and learning disabilities (LD). The term *accessibility* refers to the design of products, devices, services, or environments so that they ensure equal access for all individuals. *Test accessibility* is "the extent to which a test and its constituent item set permits the test-taker to demonstrate knowledge of the target construct" (Beddow 2009). Two individuals may have the same language competence, but accessibility issues may preclude one from demonstrating his/her competence.

The study reported here developed in the Italian context. Italian legislation establishes national guidelines that set out accommodations and exemptions for students who are medically certified, to guarantee their access to education. An increasing number of students with disabilities are continuing their studies at the university level. Censis (2017) reports that in the academic year 2014/2015, 10% students enrolled in Italian Universities were medically certified. This percentage is 13% higher than in the academic year 2011/2012. Focusing on students with LD, it is 108% higher. Censis data reported in Dolza (2017: 94, fn.4) show that 364 deaf students enrolled in Italian Universities in the academic year

2014/2015.<sup>1</sup> The number of university students with LD is increasing very quickly. Recent data (CNUDD/MUR) report that 14,441 students with LD enrolled in Italian Universities in the academic year 2019/2020, more than four times as much as in the academic year 2014/2015 (3,329).<sup>2</sup> Italian Universities are in the process of creating accessible learning environments.

Relevant to the topic of the study is the fact that for enrollment, Italian Universities require mandatory certification of general English skills at the B1 level of the Common European Framework of Reference for languages (CEFR). In addition, students must often demonstrate their skills in (written) Italian as a mandatory entry requirement. They often also take general knowledge tests. These are not language proficiency tests, but require a good competence of Italian.

In what follows, I present some results of a pilot study funded by the Italian Ministry of Education and Research (MIUR), entitled “Interventi per studenti sordi e con DSA all’Università: valutazione delle competenze linguistiche in italiano e in inglese” (Measures for deaf students and students with LD at University: Assessment of language competence in Italian and English), which involved the collaboration of scholars from the Ca’ Foscari University of Venice and the University of Bologna. Our research questions are the following: Do the tests which aim to assess language competence in L1 and L2 really do so in the case of deaf students and students with LD? Or can the negative results be attributed to the format of the tests?<sup>3</sup> Is a common reasonable accommodation such as extended time sufficient to make language proficiency tests accessible?

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<sup>1</sup> Data were more comforting in the academic year 2006/2007, when 630 deaf students were enrolled in Italian Universities, that is, 0.03% of the student population, with a considerable increase with respect to the academic year 2000/2001, cf. Mantovan *et al.* (2016).

<sup>2</sup> I.e., 0.8% of the student population (cf. <http://dati.ustat.miur.it/dataset/iscritti>).

<sup>3</sup> To provide an example of a test item not accessible to deaf students content-wise, consider the following: “*All’ombra dell’ultimo sole*” is the first line of: a. *Il Pescatore* by F. De André, b. *L’Anno che verrà* by L. Dalla, c. *La canzone del sole* by L. Battisti, d. *La donna cannone* by F. De Gregori. This item, which implies knowledge of the Italian musical culture, is not accessible to deaf students and was eliminated from the test of general knowledge used at the University of Bologna (Nicotra *et al.* 2018).

## 2. The framework and the aim of the project

Directives on assessment of students with disabilities require reasonable accommodations such as assistive technologies, extended time, individualized achievement tests, shorter tests, oral rather than written tests (for students with LD), and evaluation of content rather than form (for students with LD).<sup>4</sup> Our starting question is whether this is the only possible approach to language testing in case of students with disabilities or whether there might be another approach taking accessibility issues into account.

The conceptual framework we adopt is the International Classification of Functioning Disability and Health (ICF) (World Health Organization 2001), which is a classification of health and health-related domains. As the functioning and disability of an individual occurs in a context, ICF also includes a list of environmental factors. The aim of any effort towards accessibility should be to eliminate environmental barriers and create environmental facilitators, adopting the framework of Universal design (or Design for All).

In our context, this means that tests should not be created *ad hoc* for students with disabilities, but test items should be created as to be accessible to individuals with or without special needs, with or without disability. Of course, “there will always be unique situations which require customized solutions” (Bencini *et al.* 2018: 467); but this should not prevent efforts towards the design of accessible tests.

As said in the introduction, the aim of the project reported here is to provide students with sensory (deaf) and learning disabilities (LD) with equal opportunities in language testing required for university entrance. These two particular situations were chosen because they both affect language competence, in a somehow complementary manner, and because they are at the focus of much current linguistic research (see sections 3 and 4). As Beddow (2009) points out, the “evaluation of test and test item accessibility requires

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<sup>4</sup> See the following Italian laws: Law 104/1992 (modified by Law 17/1999); Law 170/2010; Guidelines in DM 5669, July 12, 2011.

familiarity not only with the tested material but also with the target population of a test.”

The project has designed a series of studies (i) to identify the difficulties that deaf students and students with LD encounter in computer-based tests in L1 Italian and L2 English and (ii) to develop guidelines to prepare accessible language tests.

### **3. Deafness and language competence**

Because of their atypical language acquisition, deaf individuals reach a partial competence of the national vocal language, which may make it difficult for them to learn a second language. Difficulties faced by deaf students not only concern the oral dimension of language, but also the written dimension. They may face difficulties with spelling, functional morpho-syntactic elements, field-specific lexis, and complex syntax (for Italian, cf. Caselli *et al.* 1994; Chesi 2006; Volpato 2010, 2012, 2019; Bertone *et al.* 2011; Trovato 2014, a.o.). Despite difficulties in specific aspects of language, the attained language competence may be sufficient to study at University. It is therefore important to ensure equal opportunities to deaf students who possess adequate cognitive abilities beyond the difficulties encountered with language. Note that only reading and writing should be tested. Deaf individuals should not be tested on listening and speaking (unless they ask to do so, Franceschini 2018a). It is important to remember that speech therapy and instruction on lip reading are not offered in L2 and that speech therapy on L1 cannot be transferred to L2 without specific instruction.

### **4. LD/Dyslexia and language competence**

Following the definition of the International Dyslexia Association, “Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the

phonological component of language [...]” (<https://dyslexiaida.org/definition-of-dyslexia/>, accessed on October 3, 2019).

Little attention is however still paid to the consequences of dyslexia on morpho-syntactic and textual dimensions of language and on meta-linguistic competence, which are required in tertiary education. The difficulties faced by students with dyslexia may concern not only the written but also the oral dimension of language. They may indeed show difficulties in oral comprehension and production. Students with dyslexia may display phonological deficits (Ramus *et al.* 2003) and difficulties in the repetition of non-words (Brady *et al.* 1983; Elbro 1997); poor lexicon (Snowling *et al.* 2003) and difficulties in naming tasks (Manis *et al.* 1997, 2000); syntactic deficits in the (oral) comprehension and production of: (i) passives and relative clauses (Mann *et al.* 1984; Stein *et al.* 1984; Barshalom *et al.* 1993; Wisehart *et al.* 2009; Robertson and Joanisse 2010; Cardinaletti and Volpato 2011, 2015; Sevcenco *et al.* 2014; Pivi 2014; Pivi and Del Puppo 2015; Pivi *et al.* 2016; Arosio *et al.* 2017); (ii) cleft sentences (Pivi *et al.* 2016); (iii) interrogative sentences (Guasti 2013; Guasti *et al.* 2015; Stanford and Delage 2019); (iv) clitic pronouns (Avram *et al.* 2013; Guasti 2013; Zachou *et al.* 2013; Arosio *et al.* 2016; Cardinaletti 2018; Delage and Durrleman 2018; Vender *et al.* 2018); (v) verb morphology (Rispen *et al.* 2004); (vi) negation (Vender and Delfitto 2010).

These difficulties are also found in individuals with Specific Language Impairments (SLI), recently called Developmental Language Disorders (DLD) (Bishop *et al.* 2016, 2017). The relationship between developmental dyslexia (DD) and DLD is controversial. The Severity model (Kamhi and Catts 1986; Tallal *et al.* 1997) claims that DD and DLD should be understood as a single disorder, with phonological deficits being more severe in DLD than in DD. The Additional deficit model (Bishop and Snowling 2004) advocates that DLD displays additional non-phonological deficits beyond the phonological deficits typical of DD. Finally, the Comorbidity model (Catts *et al.* 2005) suggests that DD and DLD are two separate disorders with different causes, which may be present in one and the same individual.

The Comorbidity hypothesis is based, among others, on the existence of individuals who have a DLD without DD and individuals who have DD without DLD (Catts *et al.* 2005; Bishop *et al.* 2009; Pennington and Bishop 2009; Ramus *et al.* 2013; Talli *et al.* 2016), and on the evidence that the characteristics of phonological deficits are partially different in the two populations (Ramus *et al.* 2013). The question is however still open as to why comorbidity occurs so frequently, in about 50% of cases (McArthur *et al.* 2000; Ramus *et al.* 2013).

An important issue is the diagnosis of SLI/DLD in individuals with DD. As Catts *et al.* (2005: 1380) point out, “Whereas these oral language difficulties were present, they were typically not severe enough for children to have been identified as having SLI (Scarborough, Dobrich 1990). This has also been the case for other studies that have documented oral language problems in children with a family risk for dyslexia (e.g., Gallagher *et al.* 2000).”

In spite of difficulties with specific aspects of language, the attained language competence may be sufficient for individuals with LD/dyslexia to access University. It is therefore important to ensure equal opportunities to students with LD/dyslexia who possess adequate cognitive abilities beyond the difficulties encountered with language.

## **5. L1 vs. L2 language tests**

The analysis of language tests currently used in Italian Universities revealed different approaches to assess language competence. Italian tests often aim at verifying the knowledge of spelling rules, the knowledge of irregular words or words typical of the very formal registers of the language. These aspects are very demanding for students with LD and deaf students and tell us little about their real linguistic and communicative competence. L2 English tests instead aim at assessing actual language competence at different CEFR levels, but are often limited to reading and writing skills. Note that students with dyslexia might attain a higher competence in the oral than in the written language and may be disfavoured by this practice.

The question is what purpose L1 language tests should have. For University admission tests, it is necessary to assess whether the language competence in L1 is sufficient to attend University. To do so, L1 tests should be modelled on L2 tests. And to ensure accessibility, these tests should avoid tasks and items which are unnecessarily complex for deaf students and students with LD.

L1 language tests should assess the comprehension and production of complex structures that are typical of the formal register used at University in both written and oral tasks (complex sentences, relative clauses, passives, long-distance pronominal dependencies, etc.). Many constructions of the formal register are acquired late and thanks to language experience of this variety at school and via reading. For instance, genitive and oblique relative clauses are produced not earlier than the age of 10 years (Guasti and Cardinaletti 2003) and are still problematic for high-school students. In a repetition task, complex sentences containing oblique relative clauses like *La bambina lava il cane a cui il padrone dà i biscotti* (the girl washes the dog to whom the owner gives biscuits) were repeated by high-school students 57% of the time, and the percentage was lower (38%) in high-school students with LD. In an elicited production task, the former group produced genitive and oblique relative clauses 37% of the time, while the latter group only 16% (Cardinaletti, Piccoli, Volpato, to appear).

L2 language tests should also assess the comprehension of both written and oral complex texts used at University. They should assess whether students have sufficient English language competence to take e.g. courses in English-medium Universities, by visiting professors, when studying abroad as Erasmus students, etc. (Newbold 2018a).

In what follows, the two tests developed for the pilot study are presented. They allowed us to identify the difficulties faced by deaf students and students with LD in taking L1 and L2 language tests and to suggest guidelines for accessible language testing. One of the most common accommodations, namely extended time, is also discussed.

## 6. The L1 test

The test on L1 Italian was designed as a set of tasks which resemble those usually used for L2 testing: reading comprehension, listening, grammar test, cloze test, and c-test.

The participants were University students: 33 students with LD (in most cases dyslexia, alone or associated with other LDs), 11 deaf students, and 60 controls.

In the reading comprehension task, 3 texts of different length and complexity were used, and both True/False questions and Multiple-choice questions with 4 options. In Text 1, most difficulties were found in the case of True/False answers, in particular when the correct answer was “False”: students with LD 83% vs. 48%, deaf students 88% vs. 60%, controls 94% vs. 65%. Particularly demanding were the questions which required inferences to be made or which contained words that were not present in the text provided by the examiner (e.g., synonyms) (Franceschini 2018b). Text 2 contained a double negation: *La ricerca **non** vuole suggerire che **non** vi sia l’influenza dell’ambiente su crescita e sviluppo culturale e sulle performance scolastiche* (the research does not want to suggest that there is no influence by the environment on cultural development and on school performance). Difficulties in the interpretation of double negation were observed: The 4-option multiple-choice question gave rise to only 64% correct answers by students with LD and deaf students, against 98% correct answers by controls.

In the listening task, which was not taken by deaf students, some difficulties in the group of students with LD were observed (Zanoni 2018). This confirms that oral comprehension may be demanding for students with LD, as we have pointed out in section 4 above.

The grammar task (Volpato 2018) confirmed well-known difficulties in the interpretation of clitic pronouns. In the item sentence *Mario ha incontrato un amico di mio fratello ma, per un oscuro motivo, non lo ha salutato* (Mario met a friend of my brother’s but for an unknown reason, he did not greet him), it was asked to interpret the clitic pronoun *lo* (him/it) by individuating its antecedent (which is *Mario*). Only 67% and 64% correct answers were provided by students



with LD and deaf students, respectively, against 97% correct answers by their age peers. Similarly, difficulties in the interpretation of morphemes with grammatical content were detected. In the following item, for instance, *In quale delle seguenti parole anti NON ha lo stesso significato delle altre? a. anticamera, b. antinebbia, c. antiappannante, d. antiamericano* (in which of the following words *anti* does NOT have the same meaning as in the other words? a. anteroom, b. anti-fog, c. anti-fogging, d. anti-American), the correct answer, namely a., was only chosen 45% of the time by students with LD and 36% by deaf students, while controls gave 97% correct answers.<sup>5</sup>

The cloze test, with 19 gaps and 4-option multiple-choice questions, proved to be demanding for deaf students (78% correct answers), but also for students with LD (84% correct answers), while controls had very good results (95% correct answers). Finally, the C-test (37 gaps) proved to be particularly demanding for students with LD (22% correct answers) and more demanding for them than for deaf students (71% correct answers), against a very high percentage of correct answers by controls (95%) (Cervini 2018).

To sum up: in the L1 test, both deaf students and students with LD faced difficulties with many grammatical aspects (e.g., clitic pronouns, grammatical morphemes, negation) in both reading comprehension and the task which explicitly tested lexical and grammatical competence. They also faced difficulties with items requiring inferences, with True/False questions, and in both the Cloze and the C-test. Students with LD also faced some difficulties in the listening task.

## 7. The L2 English test

English was tested at the CEFR B1 level, through the following tasks: reading comprehension, listening, and multiple-choice fill-in grammar test. Different

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<sup>5</sup> In the tested sentence, negation was in capitals to attract the test participants' attention. Cf. Haladyna *et al.* (2002: 317).

formats were used: True/False questions, and multiple-choice questions with 3, 4, 5 options.

Among the students who took the test, the responses of those who already had a B1 certificate were analysed: 8 students with LD, 6 deaf students, and 24 controls.

In the reading comprehension task, 3 texts were attributed different types of questions: 10 True/False, 5 Multiple-choice with 3 options, and 5 Multiple-choice with 4 options (D'Este 2018). Comprehension was expectedly lower in the group of students with LD (56%) and deaf students (62%), while controls chose the correct answers 77% of the time. As in the Italian test, the True/False format proved to be very critical for students with LD, in particular those items which require the "False" response. As in the Italian test, items which required inferences have also shown to be highly demanding for students with LD. Consider the following item, where the correct answer is c.: "Most explain that the lack of computer competence is the reason for not getting internet access." *Most people without internet say: a. a connection is too cheap, b. a connection is not expensive; c. they do not have enough computer knowledge, d. they don't have a rapid connection to internet.* While controls were at ceiling (96% correct answers), students with LD chose the correct answer only 12% of the time, while they preferred the b. answer (75%) and also opted for the d. answer (12%). Deaf students' answers instead ranged over the correct c. answer (50%), the a. answer (33%), which was also chosen by controls (4%), and the b. answer (17%).

As in the Italian test, some difficulties in oral tasks were found among the students with LD. The listening task, which the deaf students did not take, consisted in the interpretation of 2 texts, namely a radio programme and a dialogue, through 2 True/False questions, 2 multiple-choice questions with 3 options, and 2 multiple-choice questions with 4 options (Newbold 2018b). Results revealed a statistically significant difference between students with LD (62% correct answers) vs. controls (75% correct answers). As in the other tasks, True/False items revealed to be highly demanding for students with LD. Consider the following: "That's your chance to win first prize – a holiday, not in Europe, no, and not even in America,

but wait for it... in Australia". Answer: *The first prize in the competition is a holiday in Europe*. The students with LD chose the correct answer, namely "False", only 25% of the time vs. 100% by controls. Finally, as in Italian and the written comprehension task, the items which required inferences proved to be very demanding for students with LD. Consider the following passage: "You can buy food – every kind of food from any shop or restaurant – even on the street. They have street stalls where people cook. They have people walking up and down the street pushing carts full of food and it's all really cheap and delicious. I like to go shopping in Bangkok. There's a lot of clothes and shoes and bags. The prices are really low and it's this lovely feeling being able to walk around and afford things." The 3-option multiple-choice question was as follows: *According to Tom, the good thing about city life in Thailand is: a. eating out in restaurants, b. meeting people on the streets, c. being able to afford lots of different things*. Students with LD chose the correct answer, namely c., only 13% of the time vs. 75% by controls. They chose all possible answers: a. 37%, b. 37%, and no answer 13%. Controls chose the wrong a. answer 25% of the time.

The Fill-in grammar test consisted in 20 sentences embedded in 5 short texts and 20 sentences in isolation, associated with multiple-choice questions with 3 and 5 options (Ludbrook 2018). General results showed a clear difference between students with LD, who gave correct answers 58% of the time, deaf students (46% correct answers), and control students, who succeeded 74%. As for the format of the test, sentences embedded in a linguistic context have shown to be easier to be completed than sentences in isolation, and 5-option items have proven to be more difficult than 3-option items. In post-task judgments, 5-option items in isolation have been judged as the most difficult format, and 3-option in-context items as the least difficult format.

## **8. Some guidelines**

Our results suggest that assessment of textual competence in reading comprehension tasks should be included in both L1 and L2 tests. They should assess the ability to make inferences and comprehend reformulations and

synonyms. Given the difficulties faced by students with LD in particular, their number however should not compromise the results of the test. Grammar tasks and listening tasks should also be included in both L1 and L2 tests to get a complete picture of the participants' language competence. A c-test implies a high cognitive effort and requires high concentration. Our results suggest that a c-test should not be included in a language test since it does not appear to be accessible to students with LD.

Another observation concerns the format of the test questions. The True/False format should be avoided. As we have seen, these questions are very demanding for students with LD, presumably because they contain an implicit negation. As I said above, students with LD may have problems in understanding negation (Vender and Delfitto 2010). For the discussion of some limits of the True/False format, see Haladyna *et al.* (2002: 323). Multiple choice items with 3 options and sentences embedded in a context have proven to be the ideal format for students with LD and deaf students. This result confirms research about multiple-choice questions, which indicates that the 3-answer choices are optimal for multiple-choice items (cf. Rodriguez' 2005 meta-analysis and Beddow *et al.* 2008, 2009).

Finally, consider accommodations. As I said in section 2, Italian Law requires up to 30% extra time for students with LD. In our pilot study, we decided to provide +20% and +25% for the Italian and the English test, respectively, in order to be able to administer a test with many tasks, however avoiding too long a test. As expected, students with LD used more time than deaf students and significantly more time than control students in all tasks, but they however did not use the extra time allotted to them. Only in the independent items with 5 options of the English grammar test, they used 246 seconds (mean) instead of the 240 seconds allotted to the control group. This suggests that too much extra time might make the test too long and unnecessarily fatiguing. This is an aspect where more research is needed (see Gregg and Nelson 2012 for a recent meta-analysis).

## **9. Further observations: No response**

We observed that students with LD did not provide any response more often than deaf students and control students. To give some examples, in the Italian grammar test, 3% of the questions about syntactic properties, 6% of the morphology items, and 11% of the part on lexical knowledge did not receive any answer by the students with LD. Deaf students did not answer 2% of the syntax questions, 4% of the morphology questions, and 7% of the questions on the lexicon. Control students always provided an answer. In the English listening test, students with LD did not answer 13% of the questions (vs. controls: 0%).

The students with LD also did not often answer the post-task judgment questions about task difficulty. As for the Italian test, they did not answer questions about the difficulty of reading comprehension 22% of the time, grammar 24% of the time, listening 24% of the time, cloze 21% of the time, C-test 30% of the time. As for the English test, they did not answer questions about the difficulty of reading comprehension 13% of the time, grammar 13% of the time, listening 33% of the time.

This attitude might have a negative impact on their academic career and should receive adequate attention (Scagnelli 2018).

## **10. Conclusions**

In this contribution, I have presented an overview of the results of a pilot study on accessible language testing for students with LD and deaf students. Our results suggest that L1 tests should be modelled on L2 tests to ensure that all language skills are assessed and a complete picture of participants' language competence is obtained.

Both the content and the format of language tests should be checked and modified accordingly having accessibility issues in mind. We have shown that the True/False format should be avoided, and that multiple-choice items should be

presented with 3 options and embedded into a linguistic context and not in isolation.

The listening tasks, in both L1 and L2, confirmed some difficulties in oral comprehension by students with LD which cannot be detected if proficiency tests only involve written skills.

Particular attention should be paid to the effectiveness of accommodations. We considered the issue of extended time, which Italian law prescribes in the case of students with LD and deaf students (and students with disabilities in general). Our results show that students with LD did not use the extra time allotted to them. More research on this accommodation is needed in order to avoid too long tests if possible.

Finally, our results also suggest that post-task judgments are highly telling and could be included in language tests to get valuable information about the students' attitudes, which can affect their university career.

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