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Pragmatic Competence in Native German Adults With and Without Developmental Dyslexia

Laura Hüser[1,2], Katharina von Kriegstein[3], Christa Müller-Axt[3,4]

1. German Teaching Methodology, Centre for Teacher Training, Technical University of Chemnitz, Chemnitz, Germany.

2. German Language and Literature Studies, Faculty of Philology, University of Leipzig, Leipzig, Germany.

3. Chair of Cognitive and Clinical Neuroscience, Faculty of Psychology, Technical University of Dresden, Dresden, Germany.

4. Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany.

* Address for correspondence:

Laura Hüser

German Teaching Methodology, Centre for Teacher Training

Technical University of Chemnitz

Carolastraße 4-6, 09111 Chemnitz Germany.

https://www.tu-chemnitz.de/zlb/professuren/grundschuldidaktik_deutsch.php

laura.hueser@zlb.tu-chemnitz.de
phone: +49 371 531-35696

1   Abstract

Developmental dyslexia (DD) is a life-long deficit in reading with unclear causes. DD negatively impacts many language skills. Relatively little is known about whether skills of pragmatic competence are compromised in individuals with DD. Here, we assess DD symptomatology in a group of native German dyslexic adults. We first test for the presence of DD subtypes along the dimensions of phonological awareness and naming speed, two key deficits in DD. We then assess pragmatic competence in adults with DD compared to control participants without DD. We found that a subclassification of DD according to phonological awareness and naming speed only partially applies and that dyslexic participants show a lower pragmatic competence than control participants.

Keywords: Developmental Dyslexia, Pragmatic Competence, Double-Deficit Hypothesis, Cognition, Linguistics

Introduction

In the present study, we investigated the pragmatic competence in a group of German native speakers with Developmental Dyslexia (in German *Lese-Rechtschreibstörung*, referred to as DD in the following). DD is a specific learning disability and characterized by inaccurate and/or disfluent word recognition as well as poor spelling, and decoding abilities (Lyon et al., 2003: 5-7). DD is a behaviourally defined disorder that describes extremes on a continuous distribution from optimal outcomes to poor outcomes (Peterson and Pennington, 2015: 285). The performance of persons with DD is in the range of poor performance when it comes to spelling and reading.

According to the classification of the Systematic Index of International Statistical Classifications of Diseases and Related Health Problems, 10th Revision in the German Modification (ICD-10-GM 2020), DD is defined as a circumscribed and major impairment in the acquisition of reading and spelling skills (2020: F81.0). Reading ability is significantly impaired in DD. For individuals affected by DD, the development of reading comprehension as well as the ability to recognize previously read words, and the ability to read aloud can be impaired. These deficits cannot be explained by developmental age, visual problems, inadequate schooling, or as a result of limited intellectual abilities (low IQ). Developmental disorders of speech or language often precede disorders affecting the development of reading skills. Impairments in reading and spelling skills often persist into adolescence, although deficits in reading skills can sometimes be compensated (ICD-10-GM 2020: F81.0).

DD is characterized by different deficits. To describe these, we draw on the concept of the Double-Deficit Hypothesis (in the following referred to as DDH) according to Wolf and Bowers (1999). The DDH is a prominent model for the subclassification of deficits in DD. The DDH postulates that deficits in phonological awareness and naming speed are two separate sources of reading dysfunction, and that deficits in both subcategories are associated with most severe

dyslexia symptomatology. To date, this model has mainly been applied to opaque languages such as English (Vukovic et al., 2004; Cirino et al., 2005; Miller et al., 2006; Nelson, 2015). In the present study, we examine whether a subclassification of DD symptoms according to the DDH also applies for adult readers of a transparent language (i.e., German).

In addition to the DDH, we investigated the pragmatic competence of individuals with DD. The major focus in DD research, both in children and adults, lies on possible deficits regarding the *phonological, syntactic, semantic*, and *morphological* dimensions of language (Vellutino et al., 2004; Cardillo et al., 2017). According to Lam and Ho (2014: 6) and Cardillo et al. (2017: 246), potential deficits along the *pragmatic* dimension have received insufficient and limited attention in the context of DD. Bishop (1998: 100), who investigated pragmatic anomalies in children with language impairments, emphasizes that deficits in pragmatic competence can be associated with other language impairments, since these impairments do not occur as single phenomena and have an impact on multiple aspects of development. Therefore, in addition to the *phonological, syntactic, semantic*, and *morphological* dimensions of DD, there is a need to also examine the *pragmatic* dimension.

To date, only few studies have investigated the link between DD and pragmatic competence. These studies have shown that individuals with DD have deficits in their pragmatic competence, as compared to individuals without DD (Griffiths, 2007; Lam and Ho, 2014; Cardillo et al., 2017; Cappelli et al., 2018). The participants in all of these studies were either native speakers of English, or of transparent languages including Italian, and logographic systems like Cantonese Chinese. Specifically, aspects of pragmatic competence relating to conversational topics and attention to context (Lam and Ho, 2014), comprehension of nonliteral meanings (Cappelli et al., 2018) as well as 'plays of words', humour (Griffiths, 2007), and metaphors (Cardillo et al., 2017) were found to be impaired in individuals with DD. To the best of our knowledge, no study has yet examined pragmatic competence in adult individuals with DD

whose native language is German, a transparent language. Here, we aim to address whether pragmatic competence is impaired in native German speakers with DD.

2   Definitions

In the following subsections, we describe the concept of the DDH (Wolf and Bowers, 1999) and provide our definition of pragmatic competence.

2.1   *The Double-Deficit Hypothesis in Developmental Dyslexia*

The DDH, first postulated by Wolf and Bowers (1999), divides the deficits of DD into two separate dimensions contributing to reading dysfunction: the dimension of phonological processes (phonological awareness) and the dimension of the naming speed of language units (Rapid Automatized Naming). We define phonological awareness according to the definition of Castles and Coltheart (2004: 78), who understand it as the conscious use of the smallest meaning-distinctive units of language, called phonemes, and more complex units such as syllables or rhymes. This definition also includes the conscious ability to process and manipulate these units. Following Mayer (2018: 22), we define naming speed as the ability to name a sequence of simultaneously visible, highly familiar symbols as quickly as possible. This division leads to a classification of individuals with DD into four groups:

(i) individuals with a single deficit in phonological awareness (phonological deficit), (ii) individuals with a single deficit in naming speed (naming speed deficit), (iii) individuals with deficits along both dimensions (double deficit), and (iv) individuals with DD without particularly distinctive deficits along both dimensions (Wolf and Bowers, 1999: 415). Individuals classified in (iii) with deficits in both phonological awareness and naming speed, coined a double deficit, show the most pervasive and severe dyslexia symptomatology (Wolf and Bowers, 1999: 415).

The subtype with a phonological deficit shows no deficits in naming speed. We expect difficulties in phonological tasks as well as in the accurate and fast reading of non-words (word attack), and in tasks on reading comprehension from this subtype (Wolf and Bowers 1999: 416). The subtype with a naming speed deficit shows no deficits in phonological tasks. We expect difficulties in tasks on naming speed, timed reading, and reading speed (reading speed as a part of reading fluency) as well as reading comprehension (Wolf and Bowers 1999: 416). The subtype with a double deficit shows deficits in both, phonological tasks as well as naming speed tasks (Wolf and Bowers, 1999: 415). We expect difficulties in tasks on the accurate and fast reading of non-words, tasks on reading comprehension, and on reading speed (as a part of reading fluency) from this subtype.

Generally, a phonological deficit, here assessed with a test on words and non-words as well as a test on exchanging consonants on word-pairs, differs from a naming speed deficit, where participants have to rapidly name alphanumeric digits (letters and numbers). The DDH has mostly been applied to opaque languages, specifically the English language. With regard to the current state of research, it is uncertain whether the DDH subclassification also applies to transparent languages such as German. Here, German as a transparent language must be distinguished from other rather opaque languages. According to Fricke et al. (2008: 105), German orthography directly reflects phonology, as supported by a consistent grapheme-phoneme correspondence, and is therefore regarded a more transparent language than, for example, the English language. Thomas et al. (2015: 436) argue that reading unknown words in transparent languages can be done with relative certainty. According to Thomas et al. (2015), the reason for this relative certainty is that the transparent grapheme-phoneme correspondence serves as a good orientation.

In contrast, Thomas et al. (2015: 436) define English as an opaque language, which means that the correspondence between phonemes and graphemes is less pronounced. Consequently, the

acquisition of the written language in English orthography is usually much slower compared to transparent languages (Thomas et al., 2015: 436).

DDH in opaque languages

Research findings from studies with adults whose first language is English are inconclusive regarding the relationship between the deficit-groups and reading and/or spelling skills in dyslexics. Vukovic et al. (2004: 447) investigated the DDH in adults with impaired reading skills and found evidence that the double deficit group was not the one with the most severe reading comprehension impairment. Conversely, the group with the naming speed deficit had the most severe reading comprehension deficits. They found that naming speed was more important to reading comprehension than to vocabulary and phonological processing. Cirino et al. (2005) investigated the DDH in adults with spelling disorders. This study showed that people with a double deficit performed similarly on timed reading comprehension tests compared to individuals with only one deficit. In contrast, Miller et al. (2006: 87), who examined adults whose children were diagnosed with DD, found that individuals with a double deficit performed significantly worse on reading ability measures (i.e., decoding, oral reading, word, and non-word reading) than those with a single deficit. Similar results were also obtained in the study by Nelson (2015: 169), in which individuals with a double deficit and a single phonological deficit demonstrated significantly lower scores on spelling tests than individuals with a single naming speed deficit, whereas no significant differences were found between any of the three subtypes regarding reading comprehension, and reading fluency.

DDH in transparent languages

Studies with children on the DDH in transparent languages have shown that a subclassification according to the DDH also partially applies to transparent languages. In these studies either a subclassification into three deficit subgroups ((i) single phonological deficit, (ii) single naming

speed deficit, and (iii) double deficit; Wimmer et al., 2000; Papadopoulos et al., 2009; Vaessen et al., 2009; Torppa et al., 2012) or a subclassification into only two deficit subgroups ((i) single phonological deficit, and (ii) double deficit; Escribano, 2007) was possible. In addition, upon closer examination, these studies also show some differences regarding spelling and reading skills compared to studies in the English language.

Spelling and reading in transparent languages

In a comparative study of German and American children, Mann and Wimmer (2002) showed that naming speed is the best predictor of reading proficiency in German, while in the English language phonological awareness best predicts future reading ability. Studies as those by Wimmer et al. (2000), Papadopoulos et al. (2009), Vaessen et al. (2009), and Torppa et al. (2012) provide evidence that naming deficits have a strong impact on reading skills in more transparent languages. Also, studies in transparent languages showed that phonological awareness predicts spelling in children as well as in later ages, for instance in native Finnish speakers (Leppänen et al., 2006; Torppa et al., 2012). Studies in transparent orthographies revealed naming speed as a predictor of reading fluency in transparent languages such as Dutch (de Jong and van der Leij, 1999), Greek (Georgiou et al., 2008), German (Landerl and Wimmer, 2008), and Finnish (Lepola et al., 2005).

2.2 *Definition of pragmatic competence*

According to Liedtke (2016: 9), the research discipline of pragmatics investigates the relationships between linguistic utterances, the specific context of utterances, and the goals being pursued by these utterances. In pragmatics, an utterance is thus considered in its context and within the scope of speaker's intentions. Griffiths (2007: 276) defines pragmatic competence as follows:

> Pragmatic competence requires an individual to process language at speed by using working memory efficiently, in order to understand the intended, rather than literal, meaning between speaker and hearer. Even within the normal population, it is recognized that individuals have differing degrees of pragmatic competence.

Therefore, it requires abilities regarding the pragmatic level of language to understand and interpret the intended meaning of a statement correctly. Following Griffiths (2007), we consider that there are different levels of pragmatic competence in individuals.

A field of research in which pragmatic competence is an important term is the field of second or foreign language acquisition. According to Laughlin et al. (2015), we define pragmatic competence as a construct with different areas. Those areas are *discourse knowledge* (knowledge regarding cohesion and coherence), *grammatical knowledge* (including morphology, syntax, semantics, phonology, and graphology), *pragmatic-functional knowledge* (knowledge about the associations between form and meaning), *sociocultural knowledge* (regarding the context and situation of a communicative encounter), and *strategic knowledge*[1] (Laughlin et al., 2015: 16-18).[2]

In consideration of all these dimensions, Laughlin et al. (2015: 19) come to the following definition of pragmatic competence, which we also adopted for the current study: "Thus, pragmatic competence is viewed as mastery of strategically relating linguistic and nonlinguistic contextual information in order to generate meaning beyond the grammatical level in oral, written, or a hybrid mode of communication." In our study, we examined pragmatic competence defined according to Griffiths (2007) and Laughlin et al. (2015) in an adult clinical group with DD.

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[1] Strategic knowledge has a particular role in this context. Laughlin et al. (2015: 18) define it as a knowledge that "represents a connective support system that is available as a resource in case of insufficient knowledge and/or communicative breakdown."

[2] Within this study, the authors review twelve different models of pragmatic competence (literature from 1973 to 2004). They include pragmatic-functional components (for example speech acts, coherence, cultural references, and figures of speech) as well as components of sociocultural knowledge (for example role of participants, norms, and conventions of interaction) in their research (Laughlin et al., 2015).

3　The current study

We investigated whether the DDH can be applied to a transparent language (i.e., German) in the context of an adult group with DD. In addition, we investigated whether the participants with DD from the deficit-groups (i.e., single phonological deficit, single naming speed deficit, and double deficit) showed different levels of impairment in reading and spelling skills. We addressed the following question:

1. To what extent can the DDH classification be applied to a group of native German adult speakers with DD and do the DDH subgroups show differences in reading and spelling abilities?

In line with Wolf and Bowers (1999), we hypothesize that the group with deficits along both dimensions (double deficit) show the most severe reading impairments (regarding reading comprehension and reading speed as a part of reading fluency). We also hypothesize that the three subtypes (phonological deficit, naming speed deficit, and double deficit) show impairments in reading comprehension, but only the naming speed and the double deficit subtype shows impairments in reading speed (as a part of reading fluency) since a naming speed deficit seems to be connected to this skill. We hypothesize that the group with deficits along both dimensions (double deficit) show the most severe spelling impairments. Following Leppänen et al. (2006), we expect that phonological awareness is the best predictor of spelling skills. Following Wimmer et al. (2000), we expect that naming speed is the best predictor of reading proficiency (especially reading fluency) in German.

In order to examine pragmatic competence in an adult German-speaking dyslexic group compared to a control group without DD, we addressed the following research questions:

2. Are there any differences in the self-assessment of pragmatic competence between dyslexic and non-dyslexic participants?

3. Are there specific aspects of pragmatic competence that particularly reinforce potential self-assessment differences between groups?

We hypothesize that DD also negatively affects the pragmatic aspects of language and that individuals with DD assess their pragmatic competence lower in comparison to the control group. We expect that especially the production of language, the interaction by which we mean the communication with others, and pragmatic phenomena like irony or sarcasm reinforce the difference between the dyslexic group and the group without DD (Griffiths, 2007; Lam and Ho, 2014; Cardillo et al., 2017; Cappelli et al., 2018).

4 Methods

4.1 *Participants*

Forty-eight adult German speakers were recruited for the current study. Our sample included 24 participants with DD and 24 control participants (see Table 1 for the demographic data of the participants). The two groups were matched in chronological age, sex, educational level, handedness, and non-verbal IQ. Group assignments were confirmed by tests on spelling (Kersting and Althoff, 2004), reading speed and comprehension (Schneider et al., 2007), and on word and non-word reading (Schulte-Körne, 2001). Participants with DD scored lower than controls on all literacy tests as well as on naming speed for letters and numbers. The scores on the diagnostic tests of DD are summarized in Table 1. Written informed consent was obtained from all participants. All participants received monetary compensation for their participation (except for the participation in the questionnaire, which was on voluntary basis).

4.2 *Design*

Non-verbal IQ

Non-verbal IQ was assessed through the HAWIE-R (Tewes, 1991). The HAWIE-R is a test for the assessment of the cognitive abilities of adults. In our study, we only used the sub-tests that are used to measure the non-verbal intelligence quotient (non-verbal IQ). We did not include the sub-tests on verbal IQ because individuals with DD have previously been shown to have less experience in spelling and reading. This may lead to a reduced vocabulary and verbal ability in comparison to subjects without DD (Ingesson, 2005: 91). The HAWIE-R is a standardized test with existing norm values for the age groups 16 - 74 years.

Tests regarding the DDH

To examine if the DDH would be applicable for an adult, German-speaking population, we assessed the phonological awareness and naming speed abilities of the participants.

Phonological Awareness

(i) Word/non-word reading test

Phonological awareness was assessed using a word/non-word reading test (Schulte-Körne, 2001). This test consisted of a sheet of paper with 2 printed word lists. The first list consisted of 48 German words, the second list consisted of 48 non-words/pseudo-words. Words and non-words consisted of two syllable to four syllable items. Example items of the word-list included: *Meinung* (*opinion*), *Namen* (names). Example items of the non-word list included *Werpültnasse*, *Lankastibaz.*

The participants were asked to read the list of words and non-words from top to bottom as quickly and accurately as possible. Accuracy and reaction times were recorded separately for each complete list.

(ii) Spoonerism test

In addition to the word/non-word reading test, we employed a modified version of the spoonerism test according to Perin (1983) to measure phonological awareness. The original version of this test included 18 items consisting of names of various music artists. In our modified version of the test, we avoided the use of names of celebrities or well-known people to prevent potential confounding effects of familiarity on test performance. The modified version thus had 20 noun and 20 verb word pairs instead. Each word consisted of two syllables and started with a consonant followed by a vowel. The nouns and verbs were selected from a published list of the most frequently used 100 nouns/verbs in the spoken and written German language (Jones and Tschirner, 2006: 182-189) to avoid potential confounds relating to a lower reading experience in dyslexics due to their developmental disorder. The test required the participants to swap the initial consonants of the two words and to reproduce the pairs in the correct order. The accuracy was recorded. An example of one the employed verb word pairs is given in (1):

(1)   ***n**ehmen*   -   ***f**allen*   /   ***f**ehmen*   -   ***n**allen*
           ***t**aking*   -   ***f**alling*   /   ***f**aking*   -   ***t**alling*

Naming speed test

Naming speed ability was assessed via the Rapid Automatized Naming test (RAN; Denckla and Rudel, 1976). In general, there are four versions of the test (RAN numbers, letters, colours, and objects). We only included the number and letter sequences of the test because previous studies showed that dyslexic participants were slower than controls in the RAN task for letters and numbers but not for objects (Díaz et al., 2012) and colours (Georgiou et al., 2018).

Two practice trials sessions were employed to familiarize participants with the task. In the first practice session, participants were presented with a sheet of paper with one printed row of five numbers/letters. Participants were asked to read aloud the presented numbers/letters. The

second practice session included three printed rows of five numbers/letters. Participants were instructed to read out aloud the items from left to right starting with the first row as quickly and accurately as possible.

The final task included 50 items in total that were printed on a sheet with 10 rows and 5 columns of numbers/letters. Participants were instructed to read out aloud the items from left to right starting with the first row as quickly and accurately as possible. Accuracy and reaction times were recorded separately for the full list of RAN letters and numbers. Accuracies and reaction times of the RAN letters and numbers were subsequently averaged to obtain composite alphanumerical RAN scores.

Literacy tests

Spelling

Spelling skills were assessed using the standardized RT spelling test (Kersting and Althoff, 2004). In this test, participants were presented with a written text (text version 'Nichtraucher'), which was read to them by an instructor. The written text contained a number of empty brackets, in which participant had to correctly write out the words that were read to them by the instructor.

Reading

We assessed reading abilities using the standardized LGVT 6 - 12 test (Schneider et al., 2007), which includes a measure for both reading speed and reading comprehension. Participant's reading speed was assessed on a time-constrained reading task (text version 'Brot und Rosenkohl'). According to Rosebrock and Nix (2020: 36-39), we understand reading speed as one of four factors (along with the accuracy in decoding words, the automation of word recognition, and the ability to sequence sentences in a sense-appropriate manner) that constitute reading fluency. Reading comprehension was evaluated by instructing participants to underline one out of three words to best fit the context in different positions of the text (text version

'Brot und Rosenkohl').

Pragmatic competence

We used a self-reporting online questionnaire in analogy to Griffiths (2007: 292-294), including selected items according to Broadbent et al. (1982), Vinegard (1994), Lee (1996), Perkins et al. (1997), and Bishop (1998) to assess participants pragmatic competence. The questionnaire consisted of 20 items in total, covering different aspects of pragmatic competence. Items were divided into 5 categories: 1) Speech production, 2) Speech reception, 3) Interaction, 4) Pragmatic models, and 5) Filling questions. Each category consisted of three to six items.

The category 'Speech production (SP)' included questions about the production of utterances (e.g., phonemes, words, sentences). An example item of this category was: "Ich kann Abläufe gut beschreiben und diese zeitlich geordnet wiedergeben." (English translation: "I can describe processes well and can convey them in chronological order."). For successful pragmatic speech production, the context and framework of the situation must be taken into account. Pragmatics considers language within its context. In speech production it is important that the speaker takes the needs of the listener into account (Rickheit et al., 2010: 47). The chosen language must be adapted to both the context of the interaction and the communication partner (Rickheit et al., 2010: 47-49). The items in the category 'Speech production' assessed whether participants are able to express themselves clearly, describe chronological sequences meaningfully and make the right choice of words. These skills refer to the conversation maxims according to Grice (1975).

The category 'Speech reception (SR)' included questions on how written or spoken utterances are interpreted by a listener. An example item of this category was: "Ich kann direkt und ohne nachzufragen verstehen, was andere mir mitteilen möchten." (English translation: "I can understand directly and without further asking what others want to tell me.") According to Rickheit et al. (2010: 78-79), pragmatic aspects of language reception deal with whether an

utterance formulated by a speaker is understood or not. If an individual, in the context of a conversation, understands and constructs the pragmatic-semantic meaning, language processing can be integrated into the comprehensive contexts of action based on this (Rickheit et al., 2010: 78-79). A pragmatic ability here is to understand messages directly, even if the speaker sometimes excludes parts of the message. Understanding is then based on the given situation, conventions, and world knowledge (Rickheit et al., 2010: 79).

The items of the category 'Speech reception' aimed to test whether participants are able to understand the utterances of a communication partner. In line with Achhammer et al. (2016: 38-39), we also included items on the reception of non-verbal communication signals (e.g., facial expressions and gestures). Non-verbal communication signals are understood to be physical movements to which the recipient ascribes a meaning during speech reception (Achhammer et al., 2016: 38-39).

The category 'Interaction (IN)' included questions about the behaviour in conversations with other individuals. An example item of this category was: "Ich kann in Gesprächen gut abschätzen, wann die andere Person zu Wort kommen möchte." (English translation: "In conversations I can estimate well when the other person wants to speak.") This category combines the two categories of 'Speech Production' and 'Speech Reception', since interaction involves a constant change in the production and reception of utterances. The items in the category 'Interaction' asked to what extent participants can concentrate on conversations and how well they can adapt utterances to the interaction or context. This category refers strongly to the Cooperative Principle according to (Grice, 1975: 45): "Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged."

The category 'Pragmatic Models (PM)' included questions regarding the comprehension of humour and non-literal language like irony or sarcasm. An example item of this category was:

"Ich kann Ironie interpretieren und habe eine Vorstellung davon, was Ironie ausmacht." (English translation: "I can interpret irony and have an idea of what constitutes irony.") Irony, sarcasm and humour are complex to understand as they rely on indirect speech acts:

> Indirect speech acts (ISA) do not only transport some cognitive conversational implicature (that is an i-implicature related to a specific illocution) but very often also convey an expressive meaning, that is an e-implicature based on emotional knowledge, that has to be inferred by the recipient. In those cases, the indirect speech act is articulated in order to give an affective judgement about the referent or state-of-affairs in question. (Schwarz-Friesel, 2009: 1)

The category 'Filling questions (FQ)' included aspects of language use, that did not correspond to the items in the other categories of the questionnaire. These items served to make it more difficult for participants to discern the intent of the questionnaire. An example item of this category was: "Ich kann gut in der Öffentlichkeit sprechen und habe keine Probleme damit, vor Publikum zu reden." (English translation: "I can speak well in public and I have no problems with speaking in front of an audience.")

The full list of items is stated in Appendix A (both in English and German, page 40-41). To provide participants with an easier assessment, all items started with the verbal phrase "I can (...)." The employed rating scale was based on a definition by Büttner (2008: 286) and included the following answer choices:

applies - rather applies - rather does not apply - does not apply

The answers of the participants were scaled in number with the following score-answer correspondence: score of 1 = "applies", score of 2 = "rather applies", score of 3 = "rather does not apply", and score of 4 = "does not apply". If the items were formulated negatively (for example "I can concentrate poorly in conversations and often only record parts of the conversation."), the answers were recoded. In this case, the score-answer correspondence was: score of 4 = "applies", score of 3 = "rather applies", score of 2 = "rather does not apply", and score of 1 = "does not apply". Recording of the scores was applied such that higher total scores corresponded to a lower level of pragmatic competence.

4.3 *Experimental Procedure*

Classification of the group with DD and the control group

The following tests were used to classify participants into the DD or the control group: the (i) RT (Kersting and Althoff 2004); the LGVT 6 - 12 regarding (ii) reading speed and (iii) reading comprehension (Schneider et al. 2007); the (iv) RAN alphanumeric composite score; the Schulte-Körne (v) word and (vi) non-word test (2001), either regarding the number of errors in percent (error quotient) or the reaction time. The subjects with DD had to perform at least 1.5 standard deviations below the mean value of the control group. The Schulte-Körne word test for the error quotient represents a special case. Since the mean value of the control group is extremely low, the highest control value is multiplied by 1.5. Individuals with DD had to perform worse than the control group in at least three of these six tests. Only the individuals with DD who meet this criterion were included in the further analysis. The control group consisted only of individuals who were not diagnosed or suspected of having DD at any time.

Classification of the DDH subgroups

The subclassification according to the DDH (Wolf and Bowers, 1999) was performed as follows: Participants were considered to present with a single phonological deficit if they performed at least 1.5 SD in reaction time or accuracy away from the mean score of the control group on at least two out of the three phonological tests (i.e., word reading, non-word reading, Spoonerism), while naming speed performance was within the normal range. Participants were considered to present with a single naming speed deficit if they did not show a deficit on the phonological tests but deviated at least 1.5 SD in reaction time from the mean score of the control group on the alphanumeric naming speed test (new averaged variable). Participants were considered to present with a double deficit if they showed a phonological and a naming speed deficit and thus, deviated at least 1.5 SD in reaction time or accuracy from the mean score of the control group on at least two out of the three phonological tests and on the alphanumeric naming speed test.

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4.4 *Statistical analysis*

Group differences between control and dyslexic participants in the pragmatic competence questionnaire (i.e., global score and subcategory scores) were assessed using non-parametric Mann-Whitney U-tests for independent samples (Wilcoxon, 1945; Mann and Whitney, 1947). All other group differences between controls and dyslexics were assessed using either two-sided independent t-tests or non-parametric Mann-Whitney U-tests for independent samples (Wilcoxon, 1945; Mann and Whitney, 1947). We conducted an item, reliability and factor analysis of the pragmatic competence questionnaire. Group differences between controls and dyslexia subtypes on measures of reading speed, reading comprehension as well as spelling were assessed using separate one-way analyses of variance (i.e., ANOVAs). Data that did not meet the assumptions for a one-way ANOVA were analysed using the non-parametric Kruskal-Wallis test. Effect sizes for ANOVAs were calculated using eta squared (η^2) (Cohen, 1973). Effect sizes for independent t-tests were calculated using Cohen's d_s (Cohen, 1988), effect sizes for non-parametric Mann-Whitney U-tests were calculated using r (Pearson correlation coefficient; Cohen, 1988).

P-values were multiple comparison corrected using Bonferroni correction, where appropriate. The Shapiro-Wilk-test (Royston, 1992) was employed to reassure that the data met the normality assumption for parametric testing. Statistical analyses were carried out using IBM SPSS Statistics, Version 24 (IBM Corp., 2016). For all statistical tests, the significance level α was defined as 5 % ($p \leq 0.05$).

Results

4.5 *Classification of the DDH-subgroups*

Demographic data and diagnostic tests

The control (n = 24) and the dyslexic (n = 24) group were well matched in terms of age ($U =$ 282.00, $p = 0.90$; r = -0.02), non-verbal IQ $t(46) = 1.41$, $p = 0.17$; $d_s = 0.40$), sex and handedness (all participants right-handed; see Table 1). The DD group scored significantly lower than the control group on the phonological awareness tests (word and non-word reading, spoonerism) as well as the naming speed tests (alphanumeric RAN, numbers and letters; all p's < 0.001; Table 1).

Table 1: *Demographic data and diagnostic tests for controls and dyslexics*

	Control group (n = 24)	Dyslexic group (n =24)	Independent t-test (df=46) / Mann-Whitney-U test
Demographic data			
Mean age ± SD, in years	25.6 ± 6.0	25.8 ± 6.5	*U= 282.00, p = 0.90; r = -0.02*
Sex	f = 13; m = 11	f = 13; m = 11	–
No. right handed	24	24	–
Education level	12/13 years of school = 24 / 10 years of school = 0	12/13 years of school = 20 / 10 years of school = 4	–
Diagnostic tests, mean ± SD			
Non-verbal intelligence [a]	120.1 ± 11.5	115.3 ± 12.3	*t = 1.41, p = 0.17; d_s = 0.40*
Spelling [b]	108.9 ±10.2	82.4 ± 9.5	*U = 26.50, p < 0.001; r = 0.80*
Reading speed [c]	59.1 ± 9.1	41.5 ± 6.3	*t = 7.77, p < 0.001; d_s = 2.24*
Reading comprehension [c]	62.5 ± 9.9	45.1 ± 8.0	*t = 6.68, p < 0.001; d_s = 1.93*
Phonological awareness			
Words and non-words			
Words errors in %	0.6 ± 1.1	4.8 ± 4.3	*U = 106.50, p < 0.001; r = -0.56*
Words reaction time in s	33.9 ± 6.4	53.2 ± 14.5	*U = 56.00, p < 0.001; r = -0.65*
Non-words errors in %	5.8 ± 4.2	26.8 ±13.4	*U = 20.00, p < 0.001; r = -0.73*
Non-words reaction time in s	67.2 ± 12.1	136.7 ± 46.2	*U = 27.00, p < 0.001; r = -0.72*
Spoonerism total (max score 100)	98.5 ± 1.5	89.5 ± 11.1	*U = 51.00, p < 0.001; r = 0.49*
Naming Speed Alphanumeric			
RAN [d]	17.0 ± 2.3	21.3 ± 3.5	*t = -4.99, p < 0.001; d_s = -1.45*

RAN = Rapid Automatized Naming
[a]: Scores based on standard scores (mean = 100, SD = 15).
[b]: Scores based on standard scores (mean = 100, SD = 10).
[c]: Scores based on standard t-scores (mean = 50, SD = 10). [d]: Mean of RAN numbers and RAN letters reaction time.

The subcategorization analysis according to the DDH based on phonological awareness and rapid naming performance of the N = 24 subjects with DD revealed that n = 10 subjects (41.7 %) showed a single phonological deficit and n = 14 subjects (58.3 %) showed a double deficit (phonological and naming speed deficit). None of the participants in our DD sample fulfilled the criteria for a single naming deficit. Furthermore, there were no participants with DD without particularly distinctive deficits along both dimensions.

Reading and spelling

We next assessed whether the phonological deficit group (n = 10) and the double deficit group (n = 14) differed in their reading and spelling abilities. Both dyslexia subgroups were well matched in terms of age ($U = 63.50$, $p = 0.71$; r = 0.03), non-verbal IQ ($t(22) = 1.44$, $p = 0.17$; $d_s = 0.59$), sex ($U = 65.00$, $p = 0.80$; r = 0.1), and handedness (all participants right-handed).

Reading speed

A one-way analysis of variance (ANOVA) was conducted to compare the effect of group (i.e., controls, phonological deficit, double deficit) on reading speed. The analysis revealed a significant difference in average reading speed scores between at least two of the groups (Welch's $F(2, 22.70) = 34.95$, $p < .001$; $\eta^2 = 0.58$). As opposed to our hypothesis that individuals with a double deficit would show the most severe reading and spelling deficits (Wolf and Bowers, 1999), Dunnett's-T3 post-hoc tests revealed that there was no significant difference in reading speed ability between the phonological deficit (*M* and *SD* 43.4 ± 7.9) and the double deficit (*M* and *SD* of 40.2 ± 4.7) group, (-3.19, 95%-CI[-10.75, 4.38], $p = 0.60$). Reading speed scores only differed between the control group (*M* and *SD* of 59.0 ± 9.1) and the phonological deficit group (-15.64, 95%-CI[-23.75, -7.54], $p < 0.001$) as well as between the control group and the double deficit group (-18.83, 95%-CI[-24.42, -13.24], $p < 0.001$).

Reading comprehension

A one-way analysis of variance (ANOVA) was conducted to compare the effect of group (i.e., controls, phonological deficit, double deficit) on reading comprehension. The analysis revealed a significant difference in average reading speed scores between at least two of the groups ($F(2, 45) = 21.80$, $p < 0.001$; $\eta^2 = 0.49$). Similar to the results on reading speed, post-hoc Bonferroni tests revealed that reading comprehension only differed between the control (*M* and *SD* of 59.0 ± 9.1) and phonological deficit group (*M* and *SD* of 43.4 ± 7.9) (-17.30, 95%-CI[-25.83, -8.77, $p < 0.001$] as well as between the control and double deficit group (*M* and *SD* of 40.2 ± 4.7; -17.43, 95%-CI[-25.05, -9.81], $p < 0.001$). However, no differences in reading comprehension were observed between the two dyslexia deficit subgroups (-0.13, 95%-CI[-9.51, 9.26], $p = 1.00$).

Spelling

A one-way analysis of variance (ANOVA) was conducted to compare the effect of group (i.e., controls, phonological deficit, double deficit) on spelling. A non-parametric Kruskal-Wallis test showed that performance in the spelling test was influenced by group affiliation ($p < 0.001$). Subsequent post-hoc tests (Bonferroni tests) showed that the double deficit and the control group differ significantly ($z = 4.76$, $p < 0.001$; r = 0.77) and that the phonological deficit and the control group differ significantly ($z = 3.99$, $p < 0.001$; r = 0.68). No differences on spelling were observed between the two dyslexia deficit subgroups ($z = 0.24$, $p = 1.00$). Taken together, these findings oppose our hypothesis that dyslexics with a double deficit, as compared to individuals with a single phonological deficit, would show most severe reading and spelling deficits.

4.6 Pragmatic competence

The item analysis regarding the questionnaire resulted in a discriminating power of $r \geq 0.3$ for 17 of 20 items in total. To determine internal consistency, Cronbach's alpha was calculated for all 20 items. The internal consistency was high ($\alpha = 0.88$). To test our hypothesis

that DD is associated with a reduced pragmatic competence, we analysed the difference in pragmatic competence scores (first pooled over all questionnaire categories) between controls (n = 20) and dyslexics (n = 20). In line with our hypothesis, this analysis revealed significantly higher overall scores in the DD (*M* and *SD* of 1.7 ± 0.3) than in the control group (*M* and *SD* of 1.3 ± 0.3; $U = 71.00$, $p < 0.001$; r = 0.56; see Figure 1). This finding indicates that the DD group judged their global pragmatic competence lower than the control group. To assess whether this effect was driven by pronounced group differences on specific subcategories of the pragmatic competence questionnaire, we further analysed potential differences in subcategory scores between controls and dyslexics. These analyses revealed significantly higher scores in the DD group as compared to the control group on the categories speech production ($U = 77.50$, $p = 0.003$; r = -0.48), speech reception ($U = 78.00$, $p = 0.003$; r = -0,49), interaction ($U = 101.50$, $p = 0.018$; r = -0.44) and pragmatic models ($U = 111.00$, $p = 0.038$; r = -0.44; see Figure 1). Finally, there were also significant group differences on the filling questions ($U = 108.00$, $p = 0.03$; r = -0,39; see Figure 1).
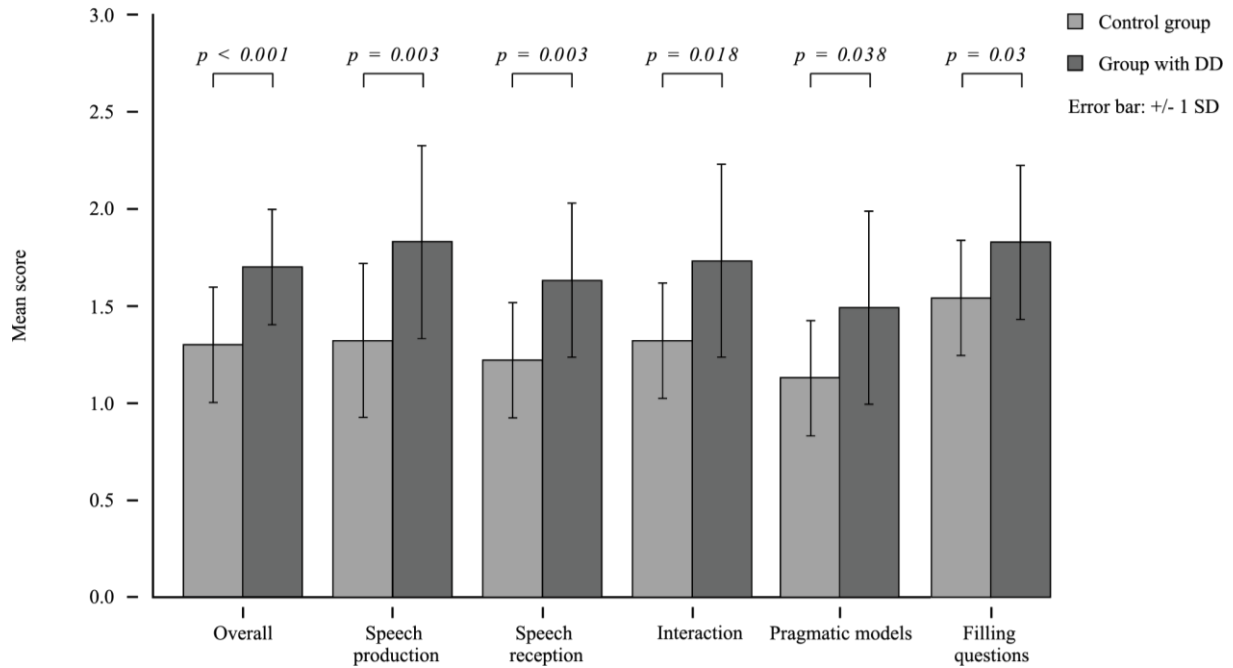
Figure 1: *Pragmatic competence scores in the control and DD group.*

5 Discussion

The subclassification regarding the DDH

In the current study, we assessed whether the DDH can be applied to individuals with DD in a transparent language, i.e. in the German language. Our results indicate that a subclassification according to the DDH into three deficit subgroups, namely (i) a single phonological deficit, (ii) a single naming speed deficit, and (iii) a double deficit, only partially applies. Specifically, we were able to identify only two of the three deficit groups according to the DDH: a group with specific deficits at the level of the phonological dimension (single phonological deficit) and a group with specific deficits among both dimensions, i.e., the phonological and the naming speed dimension (double deficit). We did not classify a group with a single deficit along the dimension of naming speed. According to our inclusion criteria for dyslexic participants in this study, only those participants with a combined deficit in reading speed, reading comprehension, and alphanumeric RAN would have fulfilled the definition of a single rapid naming deficit. However,

all of our participants with DD presented with (additional) deficits in phonological awareness, such that none of the participants could have been ascribed to a single naming deficit subgroup. This means that all the dyslexic participants included in this study showed deficits in tests that primarily retrieve phonological awareness (i.e., word reading, non-word reading, spoonerism).

Our results partly oppose previous studies on the DDH in transparent (Wimmer et al., 2000; Torppa et al., 2012) and opaque languages (Vukovic et al., 2004; Cirino et al., 2005; Miller et al., 2006), in which three deficit groups (phonological, naming speed, and double deficit) of the DDH were observed. A potential explanation for this discrepancy could be compensatory mechanisms in our adult sample of individuals with DD. Previous research on compensatory mechanisms in DD have shown that, unlike orthographic or naming speed deficits, there is only a small chance to compensate a phonological deficit (Elbro et al., 1994; Birch and Chase, 2004). This line of argumentation would be in line with Birch and Chase (2004: 392) who have argued that phonological problems comprise the core deficit in DD: "Preceding studies of language processing have suggested that compensated adults with dyslexia retain as strong a deficit in phonological processing as uncompensated adults with dyslexia but show significantly better skills in orthographic processing and rapid name retrieval." It could, thus, be possible that participants classified into the single phonological deficit group in our study previously also had naming deficits, but were able to compensate for them in adulthood. Another explanation could be sampling bias. For example, it could be that the individuals with a single naming deficit do not feel as affected as individuals with a phonological deficit and therefore do not participate in studies, or escape the educational system, or do not consider themselves to be dyslexic.

Although the rapid naming of linguistic units has been shown to be a reliable tool for testing naming speed abilities (Wolf and Bowers, 1999), the use of the RAN (Denckla and Rudel, 1976) is not consistent. For example, when the RAN is used to test the naming speed abilities in pre-literate children, only the objects and colours can be presented (Mann and Wimmer, 2002;

Torppa et al., 2012). The test was also adapted for other languages, where the letters are, for example, Greek letters (Papadopoulos et al., 2009). Other studies also adapted the RAN and used all four elements, letters, numbers, colours, and objects (Vukovic et al., 2004; Escribano, 2007; Vaessen et al., 2009). Besides the RAN, there also is the Comprehensive Test of Phonological Processing (CTOPP; Wagner et al., 1999). According to Cirino et al. (2005: 32), this test battery contains nine subtests measuring phonological awareness, rapid visual naming speed, and phonological working memory. Considering the different approaches to measuring rapid naming skills, we chose the combination of the RAN letters and digits, as studies (Díaz et al., 2012; Georgiou et al., 2018) have shown that these are the most effective in differentiating between adult dyslexic and control subjects.

Reading and spelling

A second aim of the current study was to compare the reading and spelling abilities between the DDH subgroups. We could not find any differences in spelling ability between the subgroups with a single phonological deficit and a double deficit. According to Wolf and Bowers (1999: 416), a naming deficit particularly affects reading fluency. In the context of the DDH subgroups identified in the current study, we would have therefore expected to observe greater reading ability impairments regarding reading comprehension and reading speed as a part of reading fluency in the group with a double deficit than the group with a single phonological deficit. Thus, we were surprised to find that the subgroup with a double deficit did not differ from the subgroup with a single phonological deficit, neither in reading fluency nor in reading comprehension abilities. Similar results have also been obtained in previous studies in opaque languages. For example, Vukovic et al. (2004) and Cirino et al. (2005) found no evidence for greater impairments of the double deficit group in reading comprehension as compared to the single phonological and naming speed deficit groups. Nelson (2015) did not find any differences between the three subgroups regarding reading comprehension and reading fluency.

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A phonological deficit can be an indicator of spelling difficulties (Leppänen et al., 2006; Torppa et al., 2012). In the current study, we did not find any differences in spelling ability between the groups with a double deficit and a single phonological deficit. This result might be expected as both subgroups have a phonological deficit, which could therefore be described as a core deficit of the spelling difficulties. Our results are in line with the study of Nelson (2015), in which participants in the phonological deficit group and the double deficit group did not show any differences in spelling measures.

Pragmatic competence

A further aim of the current study was to compare the self-assessment of pragmatic competence between the group with DD and the control group. We found that individuals with DD, on a global level, reported a lower pragmatic competence than control participants. This result is in line with previous studies (Griffiths, 2007; Lam and Ho, 2014; Cardillo et al., 2017; Cappelli et al., 2018) and further corroborates the notion that DD has an impact on pragmatic aspects of language.

Our results extend these previous findings by showing that all of the different categories of interest, namely speech production (SP), speech reception (SR), interaction (IN), and pragmatic models (PM), reinforce the overall effect between the dyslexic and the control group. Interestingly, both groups also differed in their responses on the category of filling questions (FQ). This finding was surprising to us, as we only included this category to make it more difficult for participants to discern the intent of the relevant categories of the questionnaire. However, as the items of the FQ category also included aspects of language use, it could well be that the two groups also differ in aspects of language beyond those covered in the other categories of the questionnaire.

Our findings of a lower self-assessment of dyslexic participants with respect to the production and reception of speech as well as interaction are in line with the results of Lam and

Ho (2014: 10-12). They showed that parents' assessments of dyslexic children are lower than the parents' assessments of non-dyslexic children through the Children's Communication Checklist-2 (CCC-2; Bishop, 2003) in the area of inappropriate initiation "involved in conversational topics such as repetitive initiations, failure to commence topics with mutual interests and talking too much".

They also showed impairments regarding an adequate comprehension and expression (regarding social rules) as well as the areas of politeness, humour, and irony (Lam and Ho, 2014: 10-12). Furthermore, our results are in line with Griffiths (2007) and Cappelli et al. (2018), who found evidence that nonliteral meanings (*indirect speech*) as well as 'plays of words', and humour are more difficult to understand for dyslexic individuals. The self-assessment of our participants supports these findings and show that complex pragmatic phenomena like humour, irony or indirect speech are more problematic for the subjects with DD than for the control group. A further explanation could be that DD is associated with lower self-esteem, which would explain the lower scores in the self-assessment of the subjects with DD compared to the control group.

Limitations

The limitations of the current study are related to the sample size, the self-assessment of the pragmatic dimension, and the tendency towards social desirability.

Sample size

We acknowledge that the modest sample size in our study on the subclassification of the DDH (N = 24, phonological deficit = 10, naming deficit = 0, double deficit = 14) might have been a limiting factor in classifying participants with DD to the different deficit subgroups of the DDH, specifically to a single naming deficit subgroup. Further studies in transparent languages with

larger sample sizes are needed to further test the subclassification on the basis of the dimension of phonological awareness and naming speed for transparent languages.

Self-assessment of pragmatic competence

Several aspects of pragmatic competence are difficult to assess based on a self-assessment questionnaire. Future research might combine questionnaires with context-related application tasks to better capture the full range of complex pragmatic competencies. In this context, third parties, such as family as well as close friends, might also be an additional valuable source of information (also in light of the Tendency towards social desirability). Nevertheless, with respect to the category of pragmatic models, further research is needed to eloquently examine how phenomena of non-literal language such as irony or sarcasm can be tested.

Tendency towards social desirability

Büttner (2008: 288) further underlines that the answers of participants in questionnaires do not reflect objective facts, but subjective points of view. A fundamental problem is the tendency towards social desirability, meaning that a response is adapted to the expectations of a social reference group (Büttner, 2008: 288). If problematic behaviour or disorders shall be estimated via self-evaluation questionnaires, another problem arises: problematic behaviour or disorders can be presented as attenuated by the test persons, which can lead to dissimulation tendencies (Büttner and Schmidt-Atzert, 2004). This potential risk cannot be excluded in the present study, even though precautions were taken in designing the questionnaire. For instance, we did not offer the answer option *neutral/not sure* to avoid a tendency towards this answer option (*Central Tendency Bias*, for more information, see Büttner (2008: 288). We also formulated negative items (for example "I can concentrate poorly in conversations and often only record parts of the conversation.") to verify that none of the participants always chose the same answer on the response scale. Future research on pragmatic competence in adults could extend the here employed self-assessment procedure with questionnaires and/or interviews, in which relatives or

friends assess the abilities of the participants. The limitations associated with self-assessment measures is also acknowledged by Griffiths (2007: 283):

> It is nevertheless recognized that there are considerable limitations with self-report measures, in terms of over-rating and under-rating perceived difficulties. It would have been preferable in different circumstances, to identify an independent measure of such competence by distributing the questionnaire to a third party who had intimate long-term knowledge of the participant.

Interviews or conversation analyses should be used as qualitative in addition to quantitative methods to provide a more comprehensive assessment of pragmatic skills.

Conclusion

The first aim of our study was to examine whether the DDH subclassification can be applied to a group of adult dyslexic individuals in a transparent language. We found that a classification according to the DDH only partially applies, as we were able to identify only two of the three DDH deficit subgroups originally proposed (Wolf and Bowers, 1999). These were a subgroup with a single phonological deficit and a subgroup with a double deficit. In contrast to the predictions made by the DDH, both of these groups did not differ in their reading and spelling performance in the current study. Further research in adult samples with DD and in transparent languages such as German will help to further characterize and refine the various subdeficits associated with DD. The latter could be addressed in language comparison research. Furthermore, more studies are required in adult participant samples with DD to unravel potential compensatory mechanisms.

The second aim of our study was to investigate whether DD is associated with a reduced pragmatic competence. We found that participants with DD rated their pragmatic competence lower than control participants on all categories (speech production, speech reception, interaction, and pragmatic models) of the self-assessment questionnaire. The group with DD also rated their abilities lower on the control questions (i.e., filling questions, FQ), although some of these items are not related to language competence (e.g., item 3 on FQ on multi-tasking). This may possibly be due to an overall lower self-esteem of the dyslexic participants

as compared to the control group. Our results may provide an initial indication of pragmatic competence difficulties in DD, but the development and implementation of objective, standardized tests in future studies is imperative to verify these potential difficulties and to fully characterize their extent. The current study provides a first characterization of pragmatic deficits and highlights the need for further research on pragmatic competence for a complete understanding of the communication deficits in DD.

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Appendix

Table 2: Overview of the different categories of the questionnaire on pragmatic competence

Speech Production (SP)

1. I can express myself clearly.

2. I can describe processes well and can convey them in chronological order.

3. I can often not express a word although it is "on the tip of my tongue".

Speech Reception (SR)

1. I can understand directly and without further asking what others want to tell me.

2. I can interpret facial expressions. This means that I can quickly tell whether a person is angry or happy.

3. I can interpret language contents badly.

Interaction (IN)

1. I can express what I want to say in a way that others can understand it well.

2. I can remember a lot of things from conversations.

3. I can easily engage in everyday conversations, so-called small talk.

4. In conversations I can estimate well when the other person wants to speak.

5. I can concentrate poorly in conversations and often only record parts of the conversation.

6. I can find appropriate formulations for my statements in conversations.

Pragmatic Models (PM)

1. I can interpret irony and have an idea what constitutes irony.

2. I can understand sarcasm and have an idea what the concept of sarcasm includes.

3. I can interpret wordplays badly.

4. I can understand certain types of humour, for example "black humour".

Filling Questions (FQ)

1. I can speak calmly and slowly.

2. I can speak well in public and I have no problems with speaking in front of an audience.

3. I can only concentrate on one thing, "multitasking" is difficult for me.

4. I can listen fully to my conversation partners and rarely allow myself to be distracted.

Table 3: Overview of the different categories of the questionnaire on pragmatic competence, German Version

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Sprachproduktion (SP)

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1. Ich kann mich sprachlich gut ausdrücken.

2. Ich kann Abläufe gut beschreiben und diese zeitlich geordnet wiedergeben.

3. Ich kann oft ein Wort nicht ausdrücken obwohl es mir "auf der Zunge liegt".

Sprachrezeption (SR)

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1. Ich kann direkt und ohne nachzufragen verstehen, was andere mir mitteilen möchten.

2. Ich kann Gesichtsausdrücke interpretieren. Das heißt, ich erkenne schnell, ob jemand verärgert oder erfreut ist.

3. Ich kann Inhalte schlecht interpretieren.

Interaktion (IN)

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1. Ich kann das, was ich sagen möchte, so formulieren, dass andere es gut verstehen.

2. Ich kann mir vieles aus Gesprächen merken.

3. Ich kann gut alltägliche Gespräche, sogenannten Smalltalk, führen.

4. Ich kann in Gesprächen gut abschätzen, wann die andere Person zu Wort kommen möchte.

5. Ich kann mich in Gesprächen schlecht konzentrieren und nehme oft nur Teile des Gesprächs auf.

6. Ich kann in Gesprächen angemessene Formulierungen für meine Aussagen finden.

Pragmatische Modelle (PM)

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1. Ich kann Ironie interpretieren und habe eine Vorstellung davon, was Ironie ausmacht.

2. Ich kann Sarkasmus verstehen und habe eine Vorstellung davon, was das Konzept Sarkasmus umfasst.

3. Ich kann Wortspiele wie "zum Bleistift" für "zum Beispiel" schlecht interpretieren.

4. Ich kann bestimmte Arten von Humor, z.B. "schwarzen Humor", verstehen.

Filling Questions (FQ)

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1. Ich kann ruhig und langsam sprechen.

2. Ich kann gut in der Öffentlichkeit sprechen und habe keine Probleme damit, vor Publikum zu reden.

3.Ich kann mich nur auf eine Sache konzentrieren, "Multitasking" fällt mir schwer.

4. Ich kann meinen Gesprächspartnern voll und ganz zuhören und lasse mich dabei nur selten ablenken.