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RESEARCH REPORT

The impact of developmental language disorder in a defendant's description on mock jurors' perceptions and judgements

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Abstract

Background: While it has been posited that young people with language needs may be viewed more negatively (e.g., as more rude, less cooperative) than those without language needs, the impact of knowing about a person's language needs on others' perceptions has yet to experimentally tested.

Aims: To examine whether the presence of a developmental language disorder (DLD) diagnosis in a defendant's information would affect mock juror ratings of guilt, sentence length, credibility and blameworthiness.

Methods & Procedures: A total of 143 jury eligible participants read a vignette of a non-violent crime. Half of the participants ($N = 73$) were told the defendant has a diagnosis of DLD, while half ($N = 70$) were not told.

Outcomes & Results: Preregistered analyses found that DLD information affected ratings of credibility and blameworthiness, though not judgements of guilt or sentence length. Unregistered content analyses were applied to the justifications participants gave for their ratings: these suggested that participants who did not have the DLD information judged the defendant more on his personality and attitude, and drew more links to his (perceived) background, while participants who received the DLD information condition made more reference to him having cognitive problems.

Conclusions & Implications: Unlike in previous studies of the impact of autism information, information about a defendant's DLD did not affect mock jurors' likelihood of finding them guilty, or lead participants to give longer sentences. However, our findings suggest knowing a person has DLD does affect others' perceptions of credibility and blameworthiness.

KEYWORDS
language disorder, youth justice, awareness

What this paper adds

What is already known on the subject

- There is already evidence that some conditions that affect communication, specifically autism, also affect juror perceptions. Research also shows that knowing whether or not a defendant has autism influences how jurors rate defendants. However, autism is not the only condition that is relevant to juror perceptions, as we also know that a high rate of young offenders have language needs, and many have language profiles like DLD.

What this paper adds to existing knowledge

- There is little research on how behaviours associated with DLD impact others' perceptions. This study reports the impact of knowing about a defendant's DLD on juror perceptions, investigating whether knowing about DLD improves judgements on guilt, sentencing lengths, credibility and culpability. Beyond the content of youth offending, this study suggests behaviours associated with DLD lead people to form more negative judgements about youth with DLD. This is important because there is still a lack of awareness of DLD both in- and outside the criminal justice system.

What are the potential or actual clinical implications of this work?

- This study shows that knowing about a person's DLD has largely positive effects on others' perceptions of them. This implies that recognizing undetected language needs in young offenders, and supporting colleagues and members of the public to know what DLD is and how it affects people, is critical for youth with DLD to be judged fairly. This study will support the case for raising awareness of vulnerability within the youth justice population, and will assist in clinicians evidencing the need for our roles in justice settings.

INTRODUCTION

A growing body of evidence highlights a link between oral language competency and interactions with the criminal justice system (Bryan et al., 2007; Snow & Powell, 2012; Winstanley et al., 2018). A large proportion of juvenile offenders have language skills below the expected level for their age (Bryan et al., 2007), and clinically significant language problems are overrepresented in young offenders (Anderson et al., 2016; Snow & Powell, 2012), with estimates that over half of young offenders could be considered as language impaired (Snow & Powell, 2008, 2011). It is imperative to understand what factors are at play in driving this association, and also how language problems, including conditions such as developmental language disorder (DLD), may be affecting young people's experiences in the criminal justice system. The present paper will focus in particular on jurors' perceptions of young people with language problems, though we first present a definition of DLD, and a summary of evidence that seeks to explain why language needs and interactions with the criminal justice system appear to pattern together.

DLD (previously known as specific language impairment) is a condition that affects around 7% of school-aged children (Norbury et al., 2016). DLD can be considered a specific form of a broader set of types of language difficulty; it is diagnosed in the absence of a biomedical explanation for a child's language problems, thus excluding children who also have a diagnosis of autism, or genetic syndromes such as Downs syndrome (Bishop et al., 2017). Children and young people with DLD may show problems with both expressing themselves and understanding the language of others, and may exhibit word finding problems, poor vocabulary, immature syntactical abilities and poor

pragmatic language skills. Historically there has been contention surrounding the non-verbal cognitive abilities of children with DLD, with some previous research on the condition and some clinical services excluding children who performed below certain levels on non-verbal intelligence tasks (Norbury et al., 2016). However, evidence does not support the idea that children with weaker non-verbal skills present with meaningfully different language problems to those with average non-verbal skills (Norbury et al., 2016) and in an international consensus exercise, it was agreed that a mismatch between verbal and non-verbal abilities would no longer be a requirement for a diagnosis of DLD (though if children meet the criteria for intellectual disability (ID) this would be their diagnosis, rather than DLD; Bishop et al., 2017). While the diagnosis of DLD itself is concerned with the presence of a language problem, children with DLD often also have comorbid attention, socio-emotional and behavioural difficulties (Özcebe et al., 2020), increased rates of depression and anxiety (Conti-Ramsden & Botting, 2008) and peer-related problems (Mok et al., 2014). However, these problems do not characterize all children with DLD. Despite its relatively high prevalence with respect to other neurodevelopmental conditions such as autism spectrum conditions (ASC), and its lifelong prevalence (cases of DLD do not resolve, rather language and communication problems will persist into adulthood), DLD remains relatively unknown by members of the general public; this low level of awareness has been argued to leave children and youth with DLD vulnerable to a range of adverse outcomes, including criminal convictions (McGregor, 2020).

Establishing the reasons behind the association between language difficulties and involvement in the criminal justice system could provide insights into how to prevent vulnerable young people from committing crimes and reduce the reoffending rate. There are multiple potential reasons for why language difficulties may pattern with involvement in the criminal justice system, and importantly these are not mutually exclusive, but rather likely co-occur, increasing an individuals' risk of involvement with the criminal justice system, and/or a negative outcome such as a guilty verdict. Potential explanations include: (1) that language difficulty has a direct or indirect effect on delinquency and criminal behaviour; (2) that language problems and involvement with the criminal justice system share relationships with other variables; and (3) that a lack of support, particularly for unrecognized language needs, increases the risk of involvement with the criminal justice system. We consider briefly the evidence for each of these accounts.

First, language problems may directly or indirectly affect criminal behaviour. Brownlie et al. (2004) found, in a longitudinal study, an effect of a child's language impairment on delinquency and arrests in later adolescence. In this study, groups of children who were identified as having language impairments, speech impairments or no language or speech problems at age 5 years were followed up at age 19 years. Parents and the young people themselves were asked about the young people's delinquency. Boys with a history of language impairment were rated as having higher delinquent behaviour by their parents (though not by the young people themselves) than those with speech problems only, or no speech or language concerns. The young people with language problems themselves reported higher arrests and higher rates of being convicted of a crime. This evidence suggests that language problems early in life increase the risk of delinquent behaviour and criminality in young adulthood. How this increased risk takes place is not clear, though one could speculate that children and young people with language needs might not understand rules and therefore be at greater risk of breaking them. Language needs early in life may also reduce access to frequent interactions and discussion of private events such as thoughts and feelings required for development of a healthy self-concept, executive functioning and perspective taking abilities (Camminga et al., 2021; Stapleton & McHugh, 2021). This may affect children's socio-emotional development, placing them at greater risk of peer problems, and emotion regulation problems due to difficulties identifying their own feelings (Hobson & van den Bedem, 2021).

In addition to language problems leading to problems that increase the risk of criminality, the association between language needs and criminal behaviour may be explained by these two factors sharing many predictor variables. For example, Bryan et al. (2007) found in an incarcerated sample, of which a large proportion had been identified as language impaired, 90% had ceased to attend school before the age of 16: early termination of schooling is a risk factor for criminal behaviour (Thornberry et al., 1985). Socio-economic status (SES) has been argued to affect language development, with children reared in poverty shown to lag behind peers in terms of their language development (Locke et al., 2002), and low SES also increases the risk of adolescent antisocial behaviour (Piotrowska et al., 2015). Literacy problems are predicted by oral language problems (Snowling & Hulme, 2020), and literacy problems predict criminal behaviour (Trzesniewski et al., 2006); although it should be noted that Snowling et al. (2000) argued that the reading problems they observed in their own sample of young offenders were best described in the context of wider oral language problems. Thus, literacy problems may simply be a manifestation of underlying oral language difficulty.

One important variable which may be a risk factor for delinquent behaviour is the restricted access to language

intervention during school. Some longitudinal cohort studies report no differences between young people with a history of DLD and those without in terms of getting into trouble, at school or with the police (Conti-Ramsden & Durkin, 2008). Importantly, samples of participants such as these have had their language needs recognized, diagnosed and supported throughout their schooling. Thus, it may not be language problems per se, but in particular an undetected language impairment that acts as a risk factor for future delinquent behaviour (Stattin & Klackenberg-Larsson, 1993). Indeed, despite the high prevalence of language problems in youth offender samples, these issues commonly go undetected: Bryan et al. (2015), examined language skills in a sample of incarcerated children and found that speech and language communication needs are not recognized in a large majority of cases upon entering custodial settings. Winstanley et al. (2018) found that when an individual with DLD had access to such support, they had less reported contact with the authorities compared with those who received no support: appropriate support for DLD therefore acts as a protective factor against offending behaviour.

The evidence above provides support that language problems and involvement in the criminal justice system may be directly linked, share common risk factors, and that this association may be especially important in those with undetected problems. An additional consideration however is that language needs may affect the perceptions made by professionals, meaning that youth who interact with the criminal justice system and who have language needs may be perceived differently to youth without language problems. Notably, this last model proposes that language difficulties may not increase the risk of criminality per se, but may impact upon how young people are treated in the criminal justice system, and increase the risk of negative outcomes such as guilty verdicts. Individuals with undetected language disorders may experience a significant number of problems when they enter the criminal justice system, which may also increase the risk of a prosecution (Loucks & Talbot, 2007). Defendants are exposed to practices which rely on the ability to communicate with others, for example, police interviews and courtroom interactions (Lavigne & Van Rybroek, 2011). It has been suggested that while under pressure an individual with poor communication skills may produce monosyllabic and poorly elaborated answers with poor non-verbal responses such as reduced eye-contact (Snow & Sanger, 2015). This may cause members of the criminal justice system to form a biased impression, resulting in assumptions of rudeness and low motivation to comply, which may in turn impact prosecution outcomes. For example, Snow and Powell (2008) suggested that there is a risk for individuals with language difficulties to be labelled as rude and uncooperative, whereas they may just be struggling to recall an event, organize their thoughts and ideas, and convey their own account to others. Despite speculations that criminal justice system professionals may be forming these opinions, there has been no direct evidence to confirm this.

A jury is a key component of the criminal justice system, and how jurors make decisions is of significant interest to both psychological research and professionals who work in or with the criminal justice system. How jurors perceive and interpret information has implications for prosecution outcomes (Bornstein & Greene, 2011). Although, there is no direct evidence for how jurors perceive differences in defendants with language disorders, there is evidence from studies that have examined the effects of ID, and specific social communication disorders, such as ASC.

Evidence concerning the impact of ID on jurors' verdicts of guilt are mixed, and effects may be dependent on the age of defendant and nature of the crime. Jurors may appear to use ID as a mitigating factor when reviewing adult cases (Garvey, 1998; Gibbons et al., 1981). However, in two studies conducted by Najdowski et al. (2009), jurors rated juveniles with ID as less responsible for their crimes and less deviant than those without ID, but disability status only reduced guilty verdicts in one of these two studies. In a subsequent study (Najdowski & Bottoms, 2012), there was no effect of a defendant's disability status on jurors' guilty versus no guilty ratings, nor on the perceived truthfulness of their confession, although jurors did rate a defendant with ID as more suggestible and expressed greater sympathy towards them. Researchers have suggested that mock jurors may only reduce their ratings of responsibility and deviancy when defendants with ID are accused of minor crimes, as opposed to crimes such as assault and murder (Najdowski & Bottoms, 2012; Najdowski et al., 2009). These crime type effects may relate to jurors' perceptions about the capacity of individuals with ID: they may find it more believable that someone with ID could commit minor crimes, but consider them to lack capacity to accomplish more serious crimes, and thus, when faced with a defendant on trial for a serious crime, doubt that an individual is truly disabled.

Examining the literature on jurors' perceptions of ASC may be particularly helpful, in so much as ASC can also be conceived of a condition that affects an individuals' communication skills especially. Language ability is highly variables in ASC, but DLD and ASC share some language problems at the behavioural level (Williams et al., 2008) and some socio-cognitive problems (e.g., emotion recognition difficulties; Taylor et al., 2015). Furthermore, unlike in the case of ID, non-verbal intellectual abilities may be preserved in both DLD and ASC. A systematic review conducted by Allely and Cooper (2017) found only four studies had investigated the impact of an ASC diagnosis on judge and juror perceptions of defendants, and three of these

studies concerned judges, not jurors. The sole study on jurors included in this review (Berryessa et al., 2015) suggested that jurors considered a defendant's ASC to reduce moral responsibility for a crime, and should be considered when deciding the legal consequences of their offending behaviour, though jurors still regarded a defendant with an ASC to be legally responsible for crimes they commit. Other subsequent evidence has also suggested individuals with an ASC are perceived differently by jurors when giving a verdict (Maras et al., 2017), and that informing jurors about their diagnosis impacts jury decisions. Maras et al. (2019) performed a mock jury study with 160 participants who read a vignette of a male defendant in court, on a charge of aggressive behaviour. Half the participants were aware he was diagnosed with an ASC and half were not. The provision of the ASC diagnosis led to participants giving significantly fewer guilty verdicts, and those with the diagnostic information rated him significantly less blameworthy and more credible. This suggests that, for jurors, the ASC diagnosis acts as an explanatory reason for the defendant's behaviour, and may be acting as a protective factor against prosecution outcomes. Supporting evidence has gone on to suggest that a defendant explicitly diagnosed with ASC resulted in fewer guilty verdicts (Sturges & Nuñez, 2021).

Thus, previous evidence suggests that jurors may consider neurodevelopmental conditions when making judgements about defendants, but the specific impacts of a DLD diagnosis has yet to be examined. The present study aimed to determine whether judgements of a defendant by mock jurors were affected by the presence of a DLD diagnosis. We examined whether the provision of a DLD diagnosis given to a defendant changes a mock jurors' verdicts of guilt or innocence, and their ratings of appropriate sentence lengths, credibility and culpability. It was predicted that providing participants with a DLD diagnosis in a defendant's background and information about the disorder would lead to reduced guilty verdicts, and the defendant being perceived as more credible and less culpable compared with participants who were not informed of the diagnosis.

METHOD

Design

The present study's design followed closely that of Maras et al.'s (2019) experiment. Using a between-subjects design, participants were randomly assigned to one of two conditions: the condition in which they received the DLD diagnosis in the vignette, or the condition in which they did not receive any information about the DLD diagnosis.

Participants

An opportunity sample of 143 mock jurors were recruited from advertisement on social media platforms, all who confirmed their eligibility for jury service in the UK. Participants were randomly assigned to either the DLD information condition or the no DLD information condition. All demographic data, including if the participants reporting having prior knowledge of DLD are shown in Table 1. These two groups were compared in terms of the proportion of males and females, occupation, age and DLD knowledge (before this experiment). Gender, age and DLD knowledge did not differ between the two groups, although there was a significant difference between the two groups in terms of their occupations: there were 11 psychology students in the no information condition and one psychology student in the DLD information condition, and 11 non-psychology students in the no information condition, with 22 in the information condition. For additional analyses on how these background variables affected responses, see the additional supporting information.

The vignette: the story of Mr Rose

Participants completed the study online using the platform Qualtrics. The participants were exposed to an online vignette of a (non-violent) crime. The vignette was devoid of graphic detail, and was not designed to be aversive or emotive; indeed, there has been no significant difference found between type of crime and language impairments, and thus it was deemed unnecessary for participants to read about a violent event (Snow & Powell, 2008). The vignette was comprised of four main sections: the case study (in which participants read a summary of the defendant's background), the event (in which participants read a summary of the events of the day of the crime), the police interview and an extract from court proceedings. Before data collection from our participants, the vignette was read by seven speech and language therapists, with experience in forensic and youth justice settings, and their feedback was given on to what extent the vignette reflected real world practice and the characteristics of individuals they see in their clinical practice. The vignette was amended accordingly. For a full version of the vignette, see https://osf.io/znve3/.

The vignette described a 22-year-old male defendant, Mr Rose, in court on a charge of shoplifting. The background information concerned his career, previous interactions with the police, and described how he had been excluded from school at age 15 due to persistent behavioural problems. If the participant was in the DLD information

TABLE 1 Participant characteristics

Group	Mean (SD) age (years)	Gender	University status	Prior DLD knowledge
Total ($N = 143$)	42.08 (16.53)	Male = 21.68% Female = 77.62% Preferred not to say = 0.69%	Not a student = 68.53% University student = 23.08% Psychology student = 8.39%	Prior knowledge = 21.12% No prior knowledge = 78.87%
DLD information ($N = 73$)	42.01 (16.29)	Male = 21.92% Female = 76.71% Preferred not to say = 1.37%	Not a student = 68.49% University student = 30.14% Psychology student = 1.36%	Prior knowledge = 20.55% No prior knowledge = 79.45%
No DLD information ($N = 70$)	42.14 (16.90)	Male = 21.43% Female = 78.57%	Not a student = 68.57% University student = 15.71% Psychology student = 15.71%	Prior knowledge = 21.73% No prior knowledge = 78.26%

condition, additional information about the DLD diagnosis was embedded within the background information section. This included a definition of DLD, that it is a condition that affects the ability to use and understand language, and described common problem faced by those with DLD. These included: trouble understanding complex sentences, finding non-literal phrases hard to understand, having a limited vocabulary and making grammatical errors when talking. The event section of the vignette described information about the offence; the participants were informed that the defendant attempted to run from the store with a MacBook Air, and that a store security staff then detained the defendant until the police arrived on scene. The police interview and the court room extract provided information on the defendant's behaviour, which was consistent with a DLD diagnosis. This included simplified speech and words put together in short ungrammatical strings (Bishop, 2006), problems using language for social communication (Rice et al., 2005), and difficulties expressing himself due to issues with retrieving the words he wanted to say. Within the court room extract, the defendant was asked if he was remorseful to which he replied 'no'. This detail was taken from a report by the Prison Reform Trust on learning disabilities and prison, which included an example of a real-world defendant being asked by a judge if they were remorseful. The defendant did not know what the word meant, and therefore simply replied by saying 'no' (Loucks & Talbot, 2007).

Procedure

Ethical approval was gained from the local ethics committee. Before beginning the study participants read an information sheet and consent form titled 'Mock jurors' ratings of guilt, honesty and defendant's ability'. The information sheet deceived the participants, as they were not informed of the true intentions of the study until after completion. Participants were asked to generate their own unique code (known only to them) which allowed participants to withdraw their data at a later stage (this was done to allow for data withdrawal after the deception had been revealed: no participants requested the withdrawal of their data). They were then asked demographic questions, including whether they were a non-student, psychology student or student of another degree topic. This was because we were concerned that recruitment could have included local students, who may have had teaching with regards to DLD.

The participants were then presented with the vignette, according to which condition they were randomly assigned. After reading the vignette, participants were first asked two memory questions, which were to make sure all participants had read and retained the information about the case. These questions were multiple choice questions about the name of the defendant, and the item that the defendant was accused of trying to steal. All participants answered these questions correctly. The participants were then asked about the defendant's guilt, sentencing, credibility (which, as per Maras et al., 2019, we measured via ratings of honesty, likeability and cognitive ability), and blameworthiness. Guilt judgements consisted of participants deciding whether they thought the defendant was guilty or not guilty. Participants who considered the defendant guilty were then asked how long they believed the defendant should be incarcerated, for on a 1–7 Likert scale: a score of 1 being a 10-week sentence, and 7 being seven years, the minimum and maximum sentences usually given for this type of crime. For ratings of likeability, cognitive functioning and honesty, these were rated on three separate 1–7 Likert scales, in which 1 represented very likable, completely honest and complete cognitive function and 7 which was very dislikeable, not honest and severely lacking cognitive function. (Note that having DLD is not necessarily considered a 'cognitive impairment'—to many clinicians, this may imply the presence of ID, which does not always occur in the context of language difficulties. Nonetheless, we were

interested in whether the presence of language difficulties in the vignette influenced participants' perceptions of a person's cognitive abilities and/or impairments.) Finally, blameworthiness was also examined on a 1–7 Likert scale, with 1 being not to blame and 7 being fully to blame. Open-ended questions were asked after each question to attain reasoning for why each participant chose that rating.

The order of the questions was: guilt, sentence length, likeability, cognitive ability, honesty and blameworthiness. Finally, before debriefing, participants were asked if they had any ideas about the true intentions of the study and if they had prior knowledge of DLD.

Preregistration of methods and analyses

Given that our design and analyses were based on the previous mock jury study by Maras et al. (2019), we preregistered our protocol and analyses on the Open Science Framework. For this preregistration, see https://osf.io/43mtd/. We had suggested a more conservative sample size estimate, due to time restraints on data collection, but our final sample size was closer to that achieved by Maras et al. The decision to stop data collection was made before analyses being conducted on the data. For preregistered analyses and additional analyses on the impact of student status on responses, see the additional supporting information.

We also noted in our preregistration that we would conduct qualitative analyses on our participants' justification answers: at the end of data collection and on review of participants' answers, we felt that a content analyses approach, rather than a thematic analysis approach taken by Maras et al. (2019), was more appropriate for the data, and allowed us to run some further exploratory analyses on the frequency of certain justifications. These analyses were not preregistered, and are labelled as such in our results section.

RESULTS

Group comparisons for the verdicts and Likert scale responses are reported first. Table 2 provides an overview of the ratings given by the two participant groups (which we refer to as the DLD information condition versus the no DLD information condition), across the different rating scales. The content analyses, and further quantitative tests on the frequency of response categories given by participants in the two conditions in their open text justifications, are then reported.

DLD information effects on guilt and sentencing leniency

A Chi-squared test of independence showed there not to be a significant association between the provision of the DLD information and guilty and not guilty verdicts ($\chi^2(1) = 2.66$, $p = 0.103$). Participants in the no DLD information condition were not statistically more likely than the participants in the DLD information condition to choose a guilty verdict.

For those who judged the defendant as guilty, a Mann–Whitney *U*-test was used to compare conditions on suggested sentence length (sentence length was not normally distributed and thus a non-parametric test was required). The test revealed sentencing lengths for the DLD information condition (median = 1.00, interquartile range (IQR) = 1.00) did not differ significantly from the no DLD information condition (median = 2.00, IQR = 2.00), $U = 624.50$, $z = -1.62$ $p = 0.105$.

DLD information effects on credibility and blameworthiness

A one-way multivariate analysis of variance (MANOVA) was used to examine if the DLD information condition had an impact on jurors' perceptions of credibility. The MANOVA revealed a significant multivariate effect of the information condition on the three combined credibility variables: Wilks's lambda $\Lambda = 0.85$ ($F(1,143) = 8.11$, $p < 0.001$), $\eta_p^2 = 0.15$, 95% confidence interval (CI) [0.04, 0.24].

Three separate univariate tests were run on the three credibility variables: likability, cognitive functioning and honesty. Univariate tests showed that ratings of likeability ($F(1,143) = 5.19$, $p = 0.024$, $\eta_p^2 = 0.04$, 95% CI [< 0.001, 0.11]) and honesty ($F(1,143) = 7.93$, $p = 0.006$, $\eta_p^2 = 0.05$, 95% CI [< 0.001, 0.14]) were significantly lower for participants in the DLD information condition compared with those in the no DLD information condition. Cognitive dysfunction was rated significantly higher for participants in the DLD information condition compared with those in the no DLD information condition: $F(1,143) = 17.75$, $p < 0.001$, $\eta_p^2 = 0.12$, 95% CI [0.03, 0.21]. Note that higher scores indicated greater disliking, dishonesty and cognitive disability: thus, participants in the DLD information condition considered the defendant more likeable, more honest but less cognitively able.

An independent *t*-test was used to examine mock juror perceptions of blameworthiness. Participants in the DLD information condition ($M = 4.03$, SD = 1.64) perceived the defendant as less to blame than the no DLD information

TABLE 2 DLD information versus no information condition ratings for sentencing, credibility and blameworthiness

	Sentencing			Credibility			
				Mean (SD)			
	Guilty verdicts	Not guilty verdicts	Sentence length, median (IQR)	Honesty	Likeability	Cognitive function	Blameworthiness, mean (SD)
DLD information	36 (51.4%)	37 (52.9%)	1.00 (1.00)	3.51 (1.48)	4.40 (0.97)	5.08 (1.22)	4.03 (1.64)
No DLD information	44 (60.3%)	26 (35.6%)	2.00 (2.00)	4.20 (1.46)	4.77 (1.00)	4.17 (1.36)	4.69 (1.57)

condition ($M = 4.69$, SD = 1.57): $t(141) = 2.45$, $p = 0.015$ (two-tailed), $d = 0.41$, 95% CI [0.08, 0.74].

Content analysis of open text justifications (unregistered analyses)

Participants' answers to the open-ended questions about why they gave the rating they did were analysed using a content analysis method. The first phase of the analytic process involved coding all comments and summarizing key points made in the responses. Participant responses were then categorized into overarching categories, and subcategories. We took a largely inductive approach to category development, although given the research topic we were particularly interested in whether participants in either group commented on his communication abilities. Where participants gave extremely vague answers (e.g., 'information provided'), they were not included in the analysis. Categories were initially developed by two researchers. The categories were then reviewed by two other researchers (each reviewing one half of the data): these reviewers were blind to which information condition each response had come from. This established the final coding scheme. To check reliability of the final coding scheme, 10% of responses (14 participants' responses, selected at random) were then coded again, blind to original development coding and coding of the two other raters. Agreement between the final coder and the two raters was 83.10% (out of a possible 65 responses that were cross-checked for perfect agreement in what major categories were ascribed to a participant's response) indicating good agreement (Hallgren, 2012).

For each justification question, Chi-squared tests were subsequently run to compare the frequency of categories between the two groups (note: no analyses were conducted at the level of subcategories, as this would have exponentially increased the number of tests being run, increasing the risk of Type 1 error). Seven Chi-squared tests showed significant differences in the frequencies of categories between the DLD information and no DLD information conditions. Seven comparisons could not be made due to violations of the assumptions for a Chi-square test. Tables 3–7 summarize the content analyses for justifications given for ratings of sentence length, likeability, cognitive function, honesty and blameworthiness, and results of the Chi-square tests. In the sections below we give a description of the categories that showed significant group differences in frequency between the information conditions: Tables 3–7 also include descriptions of categories that did not differ between the two participant groups.

For the sentence length justifications (Table 3), when comparing the frequency of different categories of response between the two information conditions, the only significant effect was for the use of cognitive impairment responses: participants in the DLD information condition were more likely to refer to cognitive impairments when justifying their sentence length. This category reflected responses in which participants noted that the participant had (or likely had) additional needs or learning disability that ought to be taken out during his sentencing. While DLD information condition participants sometimes made reference to his diagnosis (as these participants had been explicitly informed of his diagnosis), some no DLD information condition participants also suggested that they felt he had a learning disability (though this category of response occurred less frequently in responses from the no DLD information group).

Similarly, when rating his likeability (Table 4), participants in the DLD information condition gave more responses that mentioned the defendant's possible cognitive impairments, while more participants in the no DLD information condition made responses categorized as being about his personality or behaviour. Answers that were coded as mentioning his personality, attitude or behaviour included responses that indicated participants felt he behaved rudely, was stand-offish or did not cooperate with the police or those around him, or appeared hard to relate to. Participants whose responses were coded as mentioning cognitive impairment were ones in which responses that suggested they felt he

TABLE 3 Content analyses for sentence length justifications

Category of response	Example Quotes (Condition)	Definitions and key subcategories	Chi Square results
Nature of offence	'*A few months seems appropriate as no violence to others involved*' (No DLD Info)	Responses using elements of the nature of the offence to justify sentence length, including that it was his first offence, that it was an expensive laptop, that no one hurt, and he was not successful.	$\chi^2 = 1.51$, p =.220 DLD Info mentioned: 50.00% No DLD Info mentioned: 63.64%
Prison not helpful/Non-prison intervention needed	'*This person clearly needs assistance, help, education and support. Incarceration will lead to a cycle of convictions and recidivism that will ruin his life and the lives of others.*' (DLD Info)	Responses where participants seem doubtful that prison, or long prison sentences, are likely to prevent him from reoffending, or think that other interventions would be more suitable.	$\chi^2 = 0.08$, p=.777 DLD Info mentioned: 33.3% No DLD Info mentioned: 36.36%
Needs punishment	'*Enough time to make him think about what he's done and help him realise he shouldn't do it again*' (No DLD Info)	Responses that indicate he is deserving of punishment, for example that he needs to learn/reflect on actions, or that this is his own fault.	$\chi^2 = 3.50$, p = .061 DLD Info mentioned: 27.78% No DLD Info mentioned: 11.36%
Cognitive Impairment	'*I am not sure the defendant completely understood the consequences of his actions*' (DLD Info)	Responses that note that he has a condition/appears to have a condition or vulnerability.	$\chi^2 = 6.73$, p = .009 Cramer's V = .29, 95% CI [0.08, 0.49] DLD Info mentioned: 38.89% No DLD Info mentioned: 13.64%
Conduct during trial and investigation	'*Due to him not taking responsibility for his actions and showing no remorse hopefully this length of sentencing will give him time to reflect on his wrong doings and hopefully get some help*' (No DLD Info)	Responses that use elements of the participants' conduct during the arrest, police interview or court process to justify their sentence lengths. For example, his apparent lack of remorse, or lack of compliance.	Assumptions of Chi Square test violated. DLD Info mentioned: 5.56% No DLD Info mentioned: 20.45%

Note: Effect size estimates and their confidence intervals are given for statistically significant effects. Conventionally, Cramer's $V > 0.5$ is considered a high association, 0.3–0.5 a moderate association, 0.1–0.3 a low association and 0–0.1 little if any association.

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TABLE 4 Likeability codes

Category of response	Example quotations	Definitions and key subcategories	Chi square results
Personality, attitude, behaviour	'Was aware what he did was wrong, does not attempt to help in any way or be apologetic' (DLD information)	Responses from participants who felt the defendant was not likable due to issues with his personality, attitude or behaviour, including being rude or uncooperative, or showing no remorse	$\chi^2 = 7.17$, $p = 0.007$ Cramer's $V = 0.22$, 95% CI [0.05, 0.38] DLD information mentioned: 47.95% No DLD information mentioned: 70.00%
Background problems	'I feel he had a difficult start and his attitude related to his issue with authority in education' (No DLD information)	Responses that note issues with his background or perceived background, including that he seemed 'rough' or from a lower class background, or a difficult or troubled past life	$\chi^2 = 3.14$, $p = 0.076$ DLD information mentioned: 5.48% No DLD information mentioned: 14.29%
Communication issues	'Inability to communicate effectively to clarify his actions' (No DLD information)	Responses that mention something about the defendant's communication, including being uncommunicative, vague, having poor communication skills	$\chi^2 = 0.804$, $p = 0.370$ DLD information mentioned: 26.03% No DLD information mentioned: 32.86%
Further information needed	'We are not given enough information about the defendant to make a judgement' (DLD information)	Responses that argue there is not enough information included to meaningfully judge likeability. Some said they would need to get to know him, or that no positive attributes were given in the story	$\chi^2 = 0.127$, $p = 0.721$ DLD information mentioned: 16.44% No DLD information mentioned: 14.29%
Cognitive impairment	'Comes across dislikeable, however, he may have learning difficulties or another condition due to the way he answered the questions' (No DLD information)	Responses that comment on his diagnosis/suggest he has a condition that affects his ability to appear likeable, that he is unintelligent, or confused	$\chi^2 = 5.338$, $p = 0.021$ Cramer's $V = 0.19$, 95% CI [0.04, 0.33] DLD information mentioned: 71.42% No DLD information mentioned: 20.55%
Sympathy	'He seems frightened and confused and I feel sorry for him' (DLD information)	Responses in which participants justify their likeability ratings by saying they feel sorry/sympathize with the defendant, or say they felt he was nervous.	$\chi^2 = 0.945$, $p = 0.331$ DLD information mentioned: 13.70% No DLD information mentioned: 8.57%
Neutral	'No reason not to like him' (DLD information)	Responses in which participants said they did not hold strong feelings either way	$\chi^2 = 0.945$, $p = 0.331$ DLD information mentioned: 13.70% No DLD information mentioned: 8.57%

TABLE 5 Content analyses for cognitive ability justifications

Category of response	Example quotations	Definitions and key subcategories	Chi square results
Background problems	'I think he knows what he's doing he's probably just struggling financially and uneducated or has been socialised into a criminal environment' (No DLD information)	Where participants are using evidence about his past problems at school/making judgements about his background to justify their rating of his cognitive ability	$\chi^2 = 10.90$, $p < 0.001$ Cramer's $V = 0.28$, 95% CI [0.13, 0.41] DLD information mentioned: 4.11% No DLD information mentioned: 22.86%
Evidence of normal ability	'Forgets a few things such as name of the coffee shop but otherwise seems to function well' (No DLD information)	Where participants are presenting evidence or arguing for about his apparent normal abilities to justify cognitive ability ratings. For example, that he is employed, that he knows right from wrong, that he is being intentionally difficult or playing dumb	$\chi^2 = 0.581$, $p = 0.446$ DLD information mentioned: 16.44% No DLD information mentioned: 21.43%
Evidence of cognitive impairment	'Doesn't seem to be aware of what he was doing, is quite vague, suggests that he may not be in command of all his faculties' (No DLD information)	Where participants comment on specific cognitive skills, for example lacking in awareness or attention, showing memory problems, appearing confused or unintelligent. Responses that note he has a 'learning disability' are included here also	$\chi^2 = 0.524$, $p = 0.469$ DLD information mentioned: 39.73% No DLD information mentioned: 45.71%
Need further information	'I couldn't say without medical information' (No DLD information)	Where participants said they did not have enough information to judge this ability	Chi square assumptions violated DLD information mentioned: 0% No DLD information mentioned: 8.57%
Communication issues	'It's obvious he can become easily confused and struggles with complex sentences and general communication' (DLD information)	Where participants refer to issues with language and communication, including noting that he cannot express himself, is inarticulate or provides short answers, struggles to understand the questions or refers to his DLD diagnosis	$\chi^2 = 7.562$, $p = 0.006$ Cramer's $V = 0.23$, 95% CI [0.07, 0.39] DLD information mentioned: 64.38% No DLD information mentioned: 41.43%
Not a successful criminal	'[A]lso the attempt at theft is seemingly poor and doesn't seem to be well thought out and therefore maybe the defendant has poor cognitive function' (No DLD information)	Where participants note that elements of the crime itself/his conduct suggest he is not really capable of being a successful criminal	Chi square assumptions violated DLD information mentioned: 1.37% No DLD information mentioned: 5.71%

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TABLE 6 Content analyses for Honesty justifications

Category of response	Example quotations	Definitions and key subcategories	Chi square results
Lying	'It seems as if he was clearly trying to steal the MacBook and instead of admitting guilt he said he didn't know what they were going on about' (No DLD information)	Responses in which participants suggest he outright lied or partially lied. This also included responses in which participants stated they felt he was pretending not to understand or remember key details	$\chi^2 = 2.015$, $p = 0.156$, DLD information mentioned: 13.70% No DLD information mentioned: 22.86%
Evasive/not cooperating	'He refused to answer a lot of the questions' (No DLD information)	Responses in which participants felt he was avoiding the questions, not cooperating with the investigation, or being vague	$\chi^2 = 4.18$, $p = 0.041$ Cramer's $V = 0.17$, 95% CI [0.03, 0.33] DLD information mentioned: 12.33% No DLD information mentioned: 25.71%
Corroborated some basic facts	'Gave information about what he was doing before he entered Curry's and he confirmed this when in court but shady on other aspects' (No DLD information)	Responses in which participants suggest he provides some evidence of honesty or ability because he admits certain elements, or can recall certain details	$\chi^2 = 1.415$, $p = 0.234$ DLD information mentioned: 15.07% No DLD information mentioned: 22.86%
Emotional factors	'His poor account of his actions was true. I believe the coffee shop part so I'm more likely to believe he was carrying the laptop around the store innocently before being frightened into running away' (DLD information)	Responses in which participants suggest certain emotional factors impact on his honesty/ability to appear honest, including being scared, frustrated or put under pressure	Chi square assumptions violated DLD information mentioned: 6.85% No DLD information mentioned: 4.29%
Need further information	'I can't tell one way or the other' (DLD information)	Where participants say they cannot judge his honesty based on the info they have	$\chi^2 = 0.021$, $p = 0.884$ DLD information mentioned: 24.66% No DLD information mentioned: 25.71%
Cognitive impairment	'Unsure if he is being dishonest or confused' (No DLD information)	Responses in which participants suggest his cognitive problems are affecting his ability to seem honest. These include where participant note that he has a diagnosed condition, problems with his memory, or that he lacks understanding	$\chi^2 = 2.815$, $p = 0.093$ DLD information mentioned: 21.92% No DLD information mentioned: 11.43%
Not obviously guilty	'I think that he is telling it as it is' (DLD information)	Responses in which participants state they were not sure he did anything wrong, or that he has reported events as they actually occurred	$\chi^2 = 0.01$, $p < 0.929$ DLD information mentioned: 10.96%% No DLD information mentioned: 11.43%
Communication issues	'He says exactly what happens but it's hindered by his speech' (DLD information)	Responses that suggest his ability to appear honest is affected by communication. These include responses where participants suspect he did not understand the questions or could not explain himself clearly	$\chi^2 = 3.054$, $p = 0.081$ DLD information mentioned: 21.92% No DLD information mentioned: 10.00%
Background problems	'I imagine he's often been "in trouble" and so hides things to avoid being "caught", but that isn't the same as lying' (DLD information)	Responses that suggest elements of his past point to him being a dishonest person. This includes responses that note he has been in trouble before	Chi square assumptions violated DLD information mentioned: 5.48% No DLD information mentioned: 2.86%

TABLE 7 Content analyses for Blameworthiness justifications

Category of response	Example quotations	Definitions and key subcategories	Chi square results
Cognitive impairment	'Should be given leeway for learning difficulties' (DLD information)	Where participants question his cognitive ability, suggest he is confused or did not know what he was doing, raise the possibility that he was manipulated, or note that he has a diagnosed condition	$\chi^2 = 11.05$, $p < 0.001$ Cramer's $V = 0.28$, 95% CI [0.12, 0.42] DLD information mentioned: 36.99% No DLD information mentioned: 12.86%
His own actions caused this	'He did attempt to steal the laptop and admitted it' (DLD information)	Responses in which participants argue his own actions have led to the situation the defendant finds themselves in. Such responses included stating that he knew what he was doing, knew right from wrong, that these are the consequences of his own actions, and that he did try to steal or tried to run	$\chi^2 = 1.134$, $p = 0.287$ DLD information mentioned: 39.73% No DLD information mentioned: 48.57%
Conduct since event	'He seems guilty in some way as he avoided questions and wasn't compliant' (No DLD information)	Responses that relate to his behaviour during the investigation, including him being uncooperative or failing to defend himself	$\chi^2 = 3.138$, $p = 0.076$ DLD information mentioned: 5.48% No DLD information mentioned: 14.29%
Emotional factors	'He shouldn't have ran from the store with the laptop but he may have just been scared by being approached in the store' (No DLD information)	Responses in which participants think emotional factors affected the defendant's conduct/behaviour. This includes feeling intimidated, scared or being impulsive	$\chi^2 = 0.011$, $p = 0.917$ DLD information mentioned: 17.81% No DLD information mentioned: 17.14%
Communication	'… I suspect that over zealous staff and police have escalated a situation and leapt to conclusions based on Mr Rose's incoherent, inconsistent and seemingly rude responses to their questions without taking his condition into consideration' (DLD information)	This category reflects responses where participants refer to communication issues, including his answers being short, or him struggling to explain what happened	Chi square assumptions violated DLD information mentioned: 9.59% No DLD information mentioned: 1.43%
Not guilty	'He cannot be to blame as there is no actual evidence of shoplifting, he did not leave the store' (DLD information)	Responses where participants state they do not think he did anything wrong	Chi square assumptions violated DLD information mentioned: 12.33% No DLD information mentioned: 0%
Background problems	'Used to steal when he was younger' (No DLD information)	When participants use evidence form his past or background to justify his level of blameworthiness. This included references to his education, class, and past crimes	$\chi^2 = 0.136$, $p = 0.711$ DLD information mentioned: 8.22% No DLD information mentioned:10.00%
Need further information	'If not challenged by the security staff, may not have tried to run out of the store. Still not sure if he was planning to shop lift, or if he was, would he have gone through with it' (No DLD information)	Where participants said they could not make a judgement based on the information provided. Notably, many participants felt they needed more information about his intentions	$\chi^2 = 1.136$, $p = 0.287$ DLD information mentioned: 10.96% No DLD information mentioned: 17.14%

had cognitive problems which affected how likeable he seemed.

For justifications concerning his cognitive ability (Table 5), participants in the no information condition were more likely to mention the defendant's background, while participants in the DLD information condition referred more to problems with his communication skills. Responses coded as those referred to his communication skills were those that suggested problems with communication in particular evidenced a cognitive problem or learning disability. Responses coded as referring to background problems were ones that noted information from his childhood, background or problems in his past, such as problems at school, or described him as uneducated/from a lower-class background.

When justifying their ratings for his honesty (Table 6), participants in the no information condition were more likely to respond that they felt he was being evasive. This category captures responses that suggested participants felt he was not cooperating with the police interviewer or the investigation, that they felt he was avoiding the questions, or being deliberately vague.

Finally, when participants were justifying their ratings of blameworthiness (Table 7), more participants in the DLD information condition referred to cognitive impairments when justifying their ratings of blameworthiness. Akin to above, response categories reflected references to his cognitive impairments, including that he was not to blame because he did not know what he was doing or seemed to be confused. Responses under this category also sometimes raised the possibility that he was manipulated, or noted (in the case of the DLD information group) that he has a diagnosed condition.

DISCUSSION

Individuals with language needs are overrepresented in prisons and young offender institutions, but the reasons for this remain unclear. Previous researchers have posited that language problems could impact the perceptions others form of young people with language needs (Snow & Powell, 2008). Our paper examined whether jurors perceive defendants with DLD differently when they do or do not know about their language problems. Partial support for this prediction was found. There was not a significant effect on guilty verdicts, nor sentence length, but effects were found for ratings of credibility and blameworthiness. Those who did not know about the defendant's DLD considered the defendant to be more cognitively able, less likeable, more dishonest, and more blameworthy, than those informed about his DLD.

Examining the justifications that participants made for their ratings provides some clues about what aspects of the defendant's case were feeding into these different perceptions. Indeed, those who know about his DLD clearly felt his cognitive ability was relevant to their judgements about him: participants in this condition more frequently mentioned his cognitive abilities when suggesting a suitable sentencing length, and when rating his likeability and blameworthiness. Interestingly, while participants in the DLD information condition referred more to his cognitive problems than those in the No Information condition, they did not generally make more frequent references to his communication abilities, with the only significant difference in the rate of references to his communication abilities being found for justifications for ratings of cognitive function. One interpretation may be that his communication needs appeared relevant to their judgement of general cognitive skills, but our participants did not make the connection between his communication needs and his ability to give a fair and true account of what happened when rating honesty, or whether it provided mitigation against his blameworthiness if he could not communicate with the shop staff, security officers or police who attended the scene.

Our content analyses also suggested that in the absence of information about his DLD, participants did judge his character more negatively: participants in the no DLD information condition were more likely to refer to his personality and attitude, and thought him to be more likely to be lying or not cooperating. They also considered his background to be more explanative of his cognitive abilities. It is interesting that some participants (in either condition) made assumptions about the defendant's social class. Some participants mentioned that he seemed working class or of a 'lower social class' or 'a bit rough'. This could reflect an induction of accent bias within our sample, despite the vignette being presented in written form. Accent bias refers to the discrimination of an individual who speaks with an accent, as accents convey (or are assumed to convey) social or racial information about an individual (Cantone et al., 2019). Previous findings suggest that mock jurors perceive an individual with a Received Pronunciation accent as more accurate, credible and prestigious (Frumkin & Thompson, 2020). Our participants appeared to link how our defendant spoke and behaved to class. This could be investigated to further, to determine if people interacting with a child or young person with language needs tend to assume they are from more socially deprived backgrounds, relative to children or young people without language problems.

Together, these results suggest that knowledge about a person's language abilities does impact others' perceptions of them. However, we could caveat this by noting that

knowing about the defendant's DLD did not ensure participants in the DLD information condition formed positive opinions about him: 47.94% of participants in this condition still referred to his personality and attitude when judging his likeability, which included suggesting that he appeared rude, and lacking in remorse. Indeed, many participants, in both conditions, and across different justification questions, commented on his apparent lack of remorse. This section of the vignette was inspired by a true account, reported in a paper by the Prison Reform Trust about a young man with learning difficulties who had been asked by a judge if he was remorseful, and not knowing what this word meant, answered no. That this particular detail appeared to be cited by many of our participants, in both conditions, clearly highlights the importance of such misunderstandings being caught, and rectified, in the criminal justice proceedings, as these misunderstandings have consequences for the judgements that jurors make about defendants. The fact that so many participants in our DLD information condition also appeared to form rather negative judgements of our defendant could suggest that the mere presence of DLD information might not be sufficient, perhaps because DLD is poorly known about or understood by the general public (McGregor, 2020). Our participants in the DLD information condition were supplied with a brief explanation of his condition in the vignette, but future research could examine the effect of more expansive training about DLD on people's perceptions of young offenders with the condition.

This is the first study (to our knowledge) that has examined juror perceptions of defendants with DLD, and will of course require replicating. There are also some methodological limitations that future researchers may wish to address. First, we speculate the lack of effect of condition on guilt versus no guilt verdicts, and sentencing, could have been due to the nature of the crime featured in the vignette. We chose to feature a non-violent crime, and the skewed distribution of the sentence length ratings clearly suggested that almost all participants, regardless of information condition, felt that any prison time was very harsh, inducing a floor effect. Future research could seek to examine jury ratings, and the effect of a DLD diagnosis, when the defendant is accused of a violent crime. Indeed, in Maras et al. (2019), the vignette described a defendant who committed a violent crime, and they reported a significant effect of autism information on guilty verdicts. However, studies on the impact of an ID diagnosis have suggested ID status only reduces guilty verdicts when the defendant is charged with a minor crime (Najdowski et al., 2009; Najdowski & Bottoms, 2012).

Another limitation was the possibility of demand characteristics: participants in the DLD information condition especially were more likely to suggest that the study was testing the effect of this diagnostic information on their judgements. Due to a technical error, we asked our participants about what they thought the study was testing after we asked them if they had heard of DLD before, which almost certainly increased the number of individuals appearing to guess our study's true intentions. Nonetheless, we believe participant expectations likely affected our participants' ratings to some extent, and this may well have been an issue that affected Maras et al. (2019) as well, though these authors did not test this possibility. Given the likelihood of participants' guessing the study's intentions from the presence of a DLD diagnosis in the vignette, one suggestion would be to compare conditions in which the defendant has a diagnosis of DLD with another neurodevelopmental condition (such as ASC), which would mean that all participants should be equally affected by this expectation. This would also allow future researchers to test whether the presence of a more widely known about condition, such as ASC, has a greater mitigating effect in juror's judgements, compared with DLD.

Finally, while we posit that our results have implications for what happens in the criminal justice system, participants knew they were taking part in a mock juror study. How jurors would respond to DLD information in a real criminal case, during which they would perhaps have more time to read about his DLD diagnosis and question experts on what relevance it had to his behaviour, will require future study.

Practical implications of the current study include the exploration of how jurors, and other roles in the criminal justice system, can be supported to understand how an individuals' language needs might affect their presentation in court. In the case of ASC, Allely and Cooper (2017) stress that various features of ASC may impact negatively on judges' and jurors' perceptions of defendants with ASC, and thus that experts may be required to provide suitable independent advice into how a person's autism may impact their behaviour. They also highlight the potential role for intermediaries to help autistic individuals participate effectively in their trials. We would echo these recommendations, but argue that similar provisions ought to be explored for individuals with DLD, and caution that even more so than in ASC, DLD is underrecognized (McGregor, 2020): indeed, while 30% of 118 young offenders were identified as having language needs in Bryan et al. (2015), only two of these individuals had a previous record of language difficulties. Provisions for expert witnesses and intermediaries will only be provided in cases where a person's language problems have actually been detected, and thus it is also imperative that the criminal justice system includes mechanisms to support the detection of previously unrecognized speech and language needs.

CONCLUSIONS

This study was a preregistered experiment on the effect of telling mock jurors that a defendant had a diagnosis of DLD on their ratings of guilt, sentence length, credibility and blameworthiness. While effects on guilty verdicts and sentence length were not observed, effects were seen for credibility and blameworthiness. Participants who were not told about the defendant's DLD diagnosis rated him as less honest, less likeable, more cognitively able and more blameworthy. Content analyses provide some suggestions for what aspects of the defendant's case informed participants' judgements: in particular, many participants felt he was rude or uncooperative. Participants in the DLD information condition were more likely to mention that he had cognitive impairments, but participants in this condition did not frequently mentioned problems with his communication as being relevant to their ratings. Together, these results suggest that knowing about a person's DLD can affect participants' perceptions and judgements about them, though further work is needed to understand what information may help jurors to appreciate the relevance of language and communication problems to different aspects of a defendant's behaviour.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT

Data for this project are available on the Open Science Framework: https://osf.io/znve3/.

PATIENT/PARTICIPANT CONSENT

The authors confirm that all participants gave consent before taking part, and were also given the option to withdraw their data.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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