Abstract

*Background:* While research has consistently highlighted the usefulness of narrative texts for social development, this has not been fully explored with autistic adults. It has long been assumed that autistic individuals lack the social understanding to contemplate fiction, preferring non-fiction. This study aimed to explore the self-reported reading habits of autistic adults compared to neurotypical adults, accounting for higher education demands.

*Methods:* A qualitative design was used, with 43 participants (22 autistic; 21 neurotypical) completing a reading habits questionnaire and subsequent semi-structured interview.

*Results:* Neurotypical participants tended to prefer fiction, with autistic participants showing no preference between fiction and non-fiction. Four themes were identified from interview data (1) reading material choices; (2) text investment; (3) in-text social understanding; and (4) reading as a social learning device. Both groups reported evidence of empathising, perspective-taking and social understanding while reading. The autistic group additionally reported social learning outcomes from reading.

*Discussion:* Findings contradict prior assumptions that autistic individuals lack the social understanding required by fiction. Instead, findings show that social benefits of narrative texts extend to autistic readers, providing important social learning experiences.

*Keywords:* Autism; reading habits; simulation theory; social cognition; theory of mind

**What this paper adds:**

This is the first study to explore the general reading habits of autistic adults, with a wider focus on exploring whether social text benefits extend to autistic readers. This is also the first paper to explore reading preferences qualitatively, using lived experience accounts to draw conclusions, rather than relying on theoretical assumptions.

The study has been carried out by a research team consisting of autistic and non-autistic researchers. This mixture of perspectives allowed for a thorough analysis of the lived experience data. This helped to ensure that participant intent was maintained and accurately interpreted and analysed.

**1. Introduction**

Reading, particularly fiction, is believed to support continued social and emotional development (Corcoran & Oatley, 2019; Mar & Oatley, 2008). This has yet to be explored in autistic[[1]](#footnote-1) individuals, who have difficulties interpreting and responding to the social behaviours of neurotypical individuals (APA, 2013; Milton, 2012). This exploration is particularly important, with findings that autistic individuals experience mental health difficulties and loneliness (Mazurek, 2014) resulting from general difficulties forming and maintaining friendships (Sedgewick, Hill, Yates, Pickering & Pellicano, 2016). The social simulations that reading provides could allow autistic individuals to comfortably explore social situations and perspectives without the social and sensory pressures that make socialisation difficult (APA, 2013). Additionally, findings show that regular readers develop social connections with fictional narratives (Merga, 2017), which could theoretically reduce loneliness. However, this exploration has been hampered by deficit-focussed approaches that assume autistic individuals lack the socio-cognitive capacity needed to enjoy and contemplate fiction (Baron-Cohen, 1997; Baron-Cohen, 2009). This paper reports qualitative findings on how autistic adults, in comparison to neurotypical adults, engage with reading in their daily lives.

**1.1. Facilitating Social Understanding Through Reading**

Fiction and narrative non-fiction are argued to provide immersive simulations of the real social world, projecting readers into situations that enhance understandings of characters’ perspectives (Mar & Oatley, 2008; Waytz, Hershfield & Tamir, 2015). Fiction in particular is argued to be inherently social, with three proposed levels of social embeddedness: (1) the mind of the character, (2) within the mind of the author, (3) within the mind of the reader (Zunshine, 2011). This complex social simulation process, with the addition of rich contextual information, that is often unavailable in real-world settings, is believed to encourage perspective-taking (Mar & Oatley, 2008). During this simulative process, readers infer character emotions and perspectives from their own thoughts and feelings, through the activation of past, personal memories that link to narrative circumstances (Mumper & Gerrig, 2019). This reliance on personal experience alongside the projection of self is argued to temporarily blur self-other boundaries. This, according to Koopman and Hakemulder (2015), results in more nuanced self-other comparisons, particularly when contemplating literary characters. Although the blurring of self-other boundaries is viewed by some as problematic and ‘egocentric’ in the context of real-life social understanding (Lombardo & Baron-Cohen, 2011), reading provides richer detail which can be processed for longer. Thus, reading acts like a flight simulator by providing many social experiences to support social skill training, reinforcing existing knowledge and helping to develop new social understanding (Mar & Oatley, 2008; Mumper & Gerrig, 2019).

Although social benefits are believed to result from all fiction, literary fiction is thought to be particularly provocative of empathic responses (Koopman & Hakemulder, 2015). Within shared reading groups, literary fiction and poetry extracts are utilised to promote personal evocation to enhance the ‘liveness’ of texts (Longden et al., 2015). This adds a fourth level of social embeddedness to fiction: the text through the mind of other readers. Reading groups such as these provide a potential avenue for supportive social interventions.

**1.2. The Potential for Reading to Support Autistic Individuals**

The exploration of the potential of reading to support the social understanding of autistic people has been restricted by dominant theoretical assumptions, such as the ‘mindblindness’ theory (Baron-Cohen, 1997) and the empathising-systemising (E-S) construct (Baron-Cohen, 2009). These theories assume that autistic individuals have difficulties attributing mental states to others (Baron-Cohen, 1997), known as theory of mind (ToM; Premack and Woodruff, 1978). This is argued to result in ‘extreme’ egocentrism, with autistic individuals believed to apply mental states of the self to all others without consideration of similarity to self (Lombardo & Baron-Cohen, 2011). The E-S construct argues that this proposed empathic understanding deficit results in the acquisition of an opposite skill based on systematic, rule-based understandings. This has been generalised to assume that autistic people would struggle with the social complexities of fiction, preferring factual material. These assumptions are articulated in the Autism Quotient (AQ), which explicitly refers to the dislike of fiction as an autistic trait (Baron-Cohen, Wheelwright, Skinner, Martin & Clubley, 2001). Given findings that reliance on non-fiction reading (with the exception of literary biographical narratives) is associated with lower ToM scores, fewer social connections and increased loneliness (Mar, Oatley, Hirsh, dela Paz, & Peterson, 2006; Mar, Oatley & Peterson, 2009), it is vital to rigorously scrutinise the assumptions made about the reading habits and preferences of autistic individuals. Previous empirical research has also speculated that proposed limitations with imagination and social understanding amongst autistic individuals could result in difficulties with the suspension of reality required for fiction contemplation and enjoyment (Barnes, 2012; Ten Eycke & Müller, 2015).

These deficit-focussed views of autistic socio-cognition embed a limited one-sided view of the social difficulties experienced by autistic individuals, and therefore cannot fully explain autistic cognition. As social communication is two-way within any given social pair, it is inappropriate to blame one individual for social communication breakdown (Milton, Heasman & Sheppard, 2018). Therefore, difference-based views of social interaction are more helpful as the basis of exploring autistic socio-cognitive skills. This is the view proposed by Milton’s (2012) double empathy theory. This theory argues that social communication breakdowns occur due to the different cognitive and emotional styles that exist between autistic and neurotypical individuals, resulting in different generalised norms and expectations (Milton, Heasman & Sheppard, 2018). Deficit views are believed to result from the fact that autistic individuals are likely to be blamed for communication breakdowns by neurotypical individuals (Chown, 2014). Therefore, it is important that interventions aiming to improve social interaction are applicable to both autistic and neurotypical people and take a difference rather than deficit-based approach (Milton & Moon, 2012). This adds to the potential of reading as a facilitatory method for social understanding because it can be adapted to allow both autistic and neurotypical individuals access to narrative depictions of one another’s emotional and cognitive perspectives.

However, it is first important to understand how autistic individuals engage with different text types. This is particularly important due to arguments that reading benefits are exclusive to literary fiction (Koopman & Hakemulder, 2015) and assumptions of fictional barriers for autistic individuals (Baron-Cohen et al., 2001). Research with autistic children between the ages of 2 and 6 years (Armstrong, Paynter & Westerveld, 2019) and the ages 8 to 14 years (Davidson & Ellis Weismer, 2018) has showed an overall fiction preference, with no differences to non-autistic same age peers. Barnes (2012) initially explored text preferences amongst autistic adults, in comparison to non-autistic adults, with participants asked to rank four text descriptions based on preference. This included texts about (a) objects and (b) people, each split into fiction and non-fiction examples. Although these findings supported AQ assumptions of a non-fiction preference amongst autistic participants, this was due to a strong preference for non-fiction over fiction for object-focussed texts. As the study used only text descriptions and did not explore real-world reading preferences, further research is required to explore autistic adult reading preferences and habits, in comparison to non-autistic adults.

**1.3. Current Aims**

The current study fills an evidence gap by qualitatively exploring reading preferences and habits of autistic adults, in comparison to neurotypical adults. It places lived experience at the core of understanding how autistic individuals engage with reading generally, something that has become important in redefining scientific understandings of autism (Wright, Wright, Diener, & Eaton, 2014). The study had four key aims: (1) to examine the existing preferences and reading choices within ‘fictionality’ and genres; (2) to explore the level of social understanding, including ToM, while reading; (3) to assess social outcomes from reading; (4) to asses autism-specific considerations for future intervention designs.

**2. Method**

 **2.1. Participants**

Participants were recruited through social media and local advertisements. Snowball sampling was also used for autistic participants. Initially, 145 participants indicated a willingness to be involved in the study, 33 of these did not meet study eligibility and 68 dropped out prior to arranging the interview without providing reason. One neurotypical participant was removed from analysis due to evidence of English language difficulties. The overall autistic and neurotypical groups were split into higher education students and non-students, to ensure the spread of likely reading needs, as found in a pilot study (Chapple, unpublished MSc thesis). Inclusion criteria included proficient English language skills, no self-identified learning difficulty that would impact reading, and an estimated Wechsler Adult Intelligence Scale (WAIS) IQ score of 90 or above as assessed by the Quick Test (QT; Ammons & Ammons, 1962). For neurotypical participants, exclusion criteria included scoring 32 or above (the suggested cut-off score for autism) on the autism quotient (AQ; Baron-Cohen et al., 2001), or having an existing neurodivergent condition. All non-student participants were excluded if they had been enrolled on a higher educational course in the past 12 months. Autistic participants without a formal diagnosis were included to keep the sample representative, and to take account of accurate gender representation, due to the longstanding underdiagnosis of autism in women and genders outside binary norms (Cooper, Smith & Russell, 2018; Fletcher-Watson & Happé, 2019). Formally diagnosed autistic participants had no additional exclusion criteria, but undiagnosed autistic participants with an AQ score below cut-off were excluded.

Overall, 43 participants (see Tables 1, 2 and 3 for demographics) took part in a total of 31 interviews. This comprised 22 autistic participants (male N=8; female N=11; gender neutral N=3; 11 students) aged 19-67 (*M*=31.95, *SD*=12.24) and 21 neurotypical participants (male N=7; female N=13; prefer not to disclose N=1; 12 students) aged 19-61 (*M*=37.80, *SD*=14.64). The team originally sought 22 participants of each neurotype, however, data collection was stopped due to achieving saturation. Participants were interviewed either (a) in-person, in groups of <=6 (neurotypical = 5, autistic = 1) with all participants from the same group (i.e. all autistic students, all non-autistic students, all autistic non-students, all non-autistic non-students), (b) interviewed alone, in-person (neurotypical = 6, autistic = 6), or (c) via a Skype video call interview (autistic = 13; two were conducted with audio only). All in-person interviews took place in a designated, quiet interview room at the University of Liverpool. The study was approved by the University of Liverpool research ethics committee.

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| **Table 1.** Participant AQ and IQ Scores Between Neurotypes [mean(±SD)] |
|  | AQa | Estimated IQb (WAIS Equivalent) | IQb (Raw QT) |
| Autistic | 36.32 (7.21) | 100.55 (7.84) | 42.23 (2.99) |
| Neurotypical | 14.95 (6.90) | 101.24 (9.20 | 42.05 (3.35) |
| AQ: Autism quotient; QT: Quick test; WAIS: Wechsler Abbreviated Scale of IntelligenceaAQ scoresbIQ assessed by the QT |

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| **Table 2.** Autistic Participant Demographics |
| Participant No. | Age | Gender | AQa | IQb (WAIS Equivalent) | Level of Education Completed\* | Autism Status |
| 1 | 21 | Male | 35 | 90 | Bachelors | Diagnosed |
| 20 | 22 | Male | 15 | 110 | Bachelors | Diagnosed |
| 31 | 23 | Female | 43 | 102 | Bachelors | Self-Identification |
| 36 | 20 | Male | 43 | 98 | A Level | Diagnosed |
| 43 | 47 | Male | 29 | 100 | Advanced craft certificate | Diagnosed |
| 45 | 67 | Male | 33 | 102 | Below GCSE | Diagnosed |
| 60 | 22 | Male | 41 | 116 | A Level | Diagnosed |
| 63 | 20 | Female | 23 | 92 | GCSE | Diagnosed |
| 67 | 19 | Male | 33 | 92 | A Level | Diagnosed |
| 71 | 46 | Female | 37 | 108 | PGCert | Referral |
| 77 | 51 | Female | 35 | 110 | Bachelors | Diagnosed |
| 82 | 27 | Female | 42 | 98 | Masters | Referral |
| 87 | 26 | Gender Neutral | 37 | 102 | Bachelors | Diagnosed |
| 90 | 38 | Gender Neutral | 35 | 92 | PGCSE teaching qualification | Diagnosed |
| 91 | 35 | Female | 42 | 90 | Degree underway | Diagnosed |
| 94 | 42 | Female | 37 | 104 | GCSE | Diagnosed |
| 95 | 29 | Female | 39 | 104 | Foundation Degree/Diploma | Diagnosed |
| 97 | 31 | Female | 49 | 110 | Masters | Diagnosed |
| 98 | 33 | Female | 35 | 110 | Bachelors | Diagnosed |
| 113 | 25 | Female | 37 | 98 | Bachelors | Diagnosed |
| 122 | 28 | Gender Neutral | 42 | 92 | Bachelors | Diagnosed |
| 140 | 31 | Male | 37 | 92 | A Level | Diagnosed |
| \*GCSE is the standardised senior school qualification in the UKAQ: Autism quotient; QT: Quick test; WAIS: Wechsler Abbreviated Scale of IntelligenceaAQ scoresbIQ assessed by the QT |

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| **Table 3.** Neurotypical Participant Demographics |
| Participant No. | Age | Gender | AQa | IQb (WAIS Equivalent) | Level of Education Completed\* |
| 3 | 22 | Female | 29 | 98 | Bachelors |
| 4 | 26 | Female | 8 | 100 | Doctoral Level |
| 11 | 25 | Male | 14 | 96 | Masters |
| 21 | 55 | Prefer Not to Say | 11 | 108 | Masters |
| 24 | 22 | Male | 10 | 100 | Bachelors |
| 27 | 50 | Female | 16 | 90 | GCSE |
| 32 | 19 | Female | 13 | 90 | A Level |
| 35 | 26 | Female | 28 | 100 | Masters |
| 40 | 61 | Female | 7 | 96 | Postdoctoral |
| 41 | 22 | Male | 12 | 90 | Bachelors |
| 44 | 22 | Female | 18 | 96 | Bachelors |
| 50 | 60 | Male | 25 | 116 | A Level |
| 55 | 50 | Female | 5 | 96 | Masters |
| 58 | 38 | Female | 18 | 116 | Masters |
| 59 | 29 | Female | 17 | 90 | Masters |
| 62 | 53 | Female | 17 | 104 | Masters |
| 66 | 47 | Female | 18 | 120 | Doctoral Level |
| 109 | 31 | Male | 21 | 116 | Bachelors |
| 116 | 36 | Male | 7 | 100 | Bachelors |
| 117 | 42 | Male | 6 | 102 | A Level |
| 135 | 58 | Female | 14 | 102 | Bachelors |
| \*GCSE is the standardised senior school qualification in the UKAQ: Autism quotient; QT: Quick test; WAIS: Wechsler Abbreviated Scale of IntelligenceaAQ scoresbIQ assessed by the QT |

**2.2. Screening Measures[[2]](#footnote-2)**

A demographics questionnaire asked for participants’ age, gender, and highest qualification. Eligibility questions were asked at this stage.

*The Autism Quotient (AQ) (Baron-Cohen et al., 2001)*

The AQ is a 50-item questionnaire that uses statements to elicit a score that reflects autistic traits in clinical and non-clinical samples. The AQ was used to assess the number of self-reported autistic traits in both samples.

*The Quick Test (QT) (Ammons & Ammons, 1962)*

A single 50-item version of the QT was used. The raw test score can be converted to a WAIS equivalent IQ score. The test involves participants looking at 4 pictures and deciding which picture each word goes best with. Although providing only an estimated WAIS IQ, this was considered adequate for this study where its brevity was an asset.

**2.3. Interview Session Measures**

*Reading Habits Questionnaire, Adapted from The* *Reading and Media Habits Questionnaire (Stanovich & West, 1989)*

The reading habits questionnaire is a 9-item questionnaire adapted to meet the study aims to explore reading preferences. The adaptation involved removing text response and television-based questions and adding questions around fiction and genre preference. The questionnaire was used as an initial assessment of reading habits (see Figure 1) and to tailor interview questions.

A semi-structured interview schedule was derived from pilot study findings (Chapple, unpublished MSc thesis). The schedule for this study focussed on seven main areas, (1) follow up on the reading habits questionnaire: *‘Why do you prefer your favourite fiction/non-fiction genre?’* (2) relatability: *‘How easy or difficult do you find it to relate to a situation in reading material?’* (3) visualisation and escapism: *‘How specific or general are your visualisations when reading?’* (4) social situations: *‘Do you feel like you understand social situations in texts?’* (5) concentration: *‘Can you easily switch between storylines?’* (6) previous theoretical assumptions: *‘Do you feel you empathise/sympathise with people in texts?’* (7) intervention: *‘How do you feel about classic literature?’* The schedule consisted of structured open questions, such as shown above, and follow up questions.

Dictaphones were used for recording. Recordings were manually transcribed and uploaded to NVivo 10 (Castleberry, 2014).
 **2.4. Procedure**

Potential participants completed screening via a Qualtrics link with the informed consent procedure, followed by a demographic questionnaire, the QT and the AQ. Participants were assigned to the relevant group based on screening data, as outlined in sections 2.1 and 2.2. Participants who screened out or did not leave an email address had their data removed, those who screened in were invited to stage two. Informed consent was obtained at the time of interview, followed by the reading habits questionnaire. Interviews typically lasted 60-90 minutes, depending on how the interview was conducted (i.e. individual or group). Field notes were taken by the interviewer during interview. No follow up interviews were conducted. All interviews were carried out by the first author, an autistic female PhD researcher who has undergone Master’s level training on semi-structured interviewing. An autistic research assistant sat in on one of the interviews to observe the interview process. Participants were invited to contact the first or fifth author for more information prior to interview, however, no participants contacted prior. Autistic participants were informed they would be interviewed by an autistic researcher. The interviewer was acquainted with a minority of interviewees but was unfamiliar with most. Participants were asked to refer to themselves by number to protect identity. In total, eight participants (4 autistic) were invited to provide feedback on the research findings. Only two participants (1 autistic) returned feedback, and both felt that the findings reflected the reported reading habits from their interviews.

 **2.5. Analysis**

SPSS was used to analyse quantitative data on reading habits questionnaire data (see section 3.1) and to summarise demographic data.

Edited transcription was used, with the omission of irrelevant false starts, filler sections and repetition, unless used to convey significance. Transcription was completed by the first and second author who have prior experience of transcription. Resultant transcripts were checked by the first author, and not sent back to participants as there were no areas of unclarity or missing data. Interview transcripts were analysed in NVivo 10 (Bazeley & Jackson, 2013) using Framework Analysis (Ritchie & Spencer, 1994). Framework Analysis was chosen as it relies on a rigorous, sequential protocol which reduces data loss and is, therefore, good for large data sets (Parkinson, Eatough, Holmes, Stapley & Midgley, 2015). Framework Analysis protocol for psychological research provided guidance:

Stage 1: Immersion) The first author transcribed 28 interviews and manually coded all transcripts. The second author transcribed the remaining three interviews (two autistic), and selected one autistic and one non-autistic group interview transcript to code. Initial coding explored the data, highlighting topics of interest.

Stage 2: Organising) The first author sorted all data into an organisational framework within NVivo 10, using the seven interview topics as initial categories.

Stage 3: Indexing) The first author recoded all data on a line-by-line basis. The second author recoded the two group transcripts they had initially coded for comparison with the first author. These two authors met weekly to discuss codes, and, although no data was collected about percent agreement/disagreement, for the most part the codes were very similar between coders. Any differences in codes that did emerge were resolved through discussion. Inductive, exploratory coding was used, using participants’ own language where possible (Saldaña, 2009) to maintain the grounded nature of the data.

Stage 4: Charting) Recoded data was moved into initial subthemes by the first author. This process was continually checked by the second author to ensure interpretations matched. When the resultant subthemes and themes were agreed by the first and second authors, they were checked by the rest of the team. Data was reorganised, and themes renamed and refined until consensus was reached.

Stage 5: Mapping) Initially, two frameworks were produced, for each of the autistic and neurotypical groups. This enabled the team to check subthemes and themes within each group, ensuring themes accurately reflected the data. When both frameworks were agreed upon by the team, data between the two groups was combined to highlight similarities and differences.

The first and second author are autistic researchers, meaning data was analysed from autistic and non-autistic perspectives within the research team.

**3. Results**

**3.1.1. Questionnaire Results: Statistical Analysis**

**Figure 1** Clustered Bar Graph of ‘Fictionality’ Preferences and Frequency Split by Neurotype

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Fisher’s Exact Test revealed that the relationships between neurotype (autistic; neurotypical) and (a) ‘fictionality’ preferences (p=.139) and (b) fictionality reading frequency (p=.116) were non-significant (see Figure 1 for depiction).

**3.1.2. Questionnaire Results: Qualitative Summary**

The groups did not differ significantly in relation to either fictionality preference or the frequency at which participants read fiction and non-fiction (see section 3.1.1 for details of these analyses). Sample data is summarised here to provide deeper qualitative understanding of participant preferences and habits in addition to interview data in section 3.2.

12 neurotypical participants compared to 6 autistic participants stated a preference for fiction. For the autistic group, the majority (N=10) stated that they enjoyed fiction and non-fiction equally while 7 compared to 3 non-autistic participants stated a preference for non-fiction. Additionally, 11 autistic participants reported reading non-fiction most frequently while 13 non-autistic participants reported reading fiction most frequently (See Figure 1 in section 3.1.1. for a visual depiction of data on fictionality preferences and reading frequency).

When asked about general reading habits, both autistic (N=17) and non-autistic (N=15) participants read frequently at a rate of more than once per day. When looking at genre, 7 autistic participants reported preferring science-fiction with 5 preferring the fantasy genre. 7 non-autistic participants reported a preference for classic literature with a further 6 preferring crime and mystery.

**3.2. Interview Results**

The final framework (see Table 4) comprised four themes: (1) reading material choices (2) text investment (3) in-text social understanding, and (4) reading as a social learning device. Results show large overlaps between autistic and neurotypical participants. Where group differences are clear this is emphasised and later summarised in section 4. Participant quotes are split by group (A: autistic, N: neurotypical). The analyses below focus on delineating similarities and differences between the two groups within each theme.

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| **Table 4.** Final Framework with Subtheme Participant Frequency Counts |
| Theme | Subtheme | Autistic Group Frequency | Neurotypical Group Frequency |
| Reading Material Choices | General Motivators and Barriers to Reading | 22 | 21 |
|  | Learning-Related Reading | 22 | 21 |
|  | Reading as Escapism | 22 | 21 |
|  | Re-Reading Behaviours | 21 | 20 |
|  |  |  |
| Text Investment  | Achieving and Maintaining Immersion | 22 | 21 |
|  | Immersive Difficulties and Facilitation | 22 | 21 |
|  | Effects of Prolonged Absorption | 22 | 21 |
|  |  |  |
| In-Text Social Understanding | Social and Emotional Understanding in Texts | 20 | 17 |
|  | Perspective-Taking | 20 | 20 |
|  | Difficulties and Facilitators | 21 | 17 |
|  | Personal Identification with Narratives | 22 | 21 |
|  |  |  |
| Reading as a Social Learning Device | Social Design Considerations | 21 | -\* |
|  | Social Outcomes | 22 | 20 |
|  | Text-Specific Design Considerations | 21 | 18 |
| \*The neurotypical group were not asked about social design considerations due to available literature on reading aloud designs in typical populations |

**3.2.1. Reading Material Choices**

*Group Similarities*

Reviews and recommendations were a key motivator that influenced text selection and reading habits. Recommendations from friends and family were influential for nine autistic and twelve neurotypical participants. These recommendations resulted in increased pressure to engage with texts, but also acted as a method of social connection:

*(P95A) ‘it’s sort of like a relationship tie, where I do it so that we have something to talk about, otherwise maybe we won’t connect the same.’*

*(P58N) ‘I have some very close friends…one of these things that we talk about when we’re all together is “have you read this book?”’*

Although students had more learning-related reading pressures, reading to learn was a common motivator across groups. Most participants relied upon non-fiction for learning purposes. However, six autistic and three neurotypical participants found fiction valuable for conceptual learning due to the surrounding social complexities:

*(P87A) ‘if I read something with the same theme but through fiction, for me that makes a lot more sense, it’s got a lot more emotion involved’*

*(P62N) ‘if facts about history or politics were related to me as part of a story, I would absorb that much better’*

Fiction was described as being used to facilitate escapism for the majority of participants. This often resulted from wanting a positive distraction from everyday life, particularly during difficult times:

*(P91A) ‘there are times in the past when I’ve been worried or anxious that I’ve read and it’s stopped me worrying’*

*(P3N) ‘a lot of reading fiction…was just that little like “this is my own world where I don’t have to deal with anything else at the moment”’*

Fantasy texts in particular were described as facilitative for escapism, due to the in-depth world building and resultant immersion. However, some participants struggled to suspend disbelief while reading fantasy, finding science-fiction more plausible. Both groups described a need for consistent rules within fantasy texts:

*(P60A) ‘I like things to be at least basically believable…if I’m reading something and all the events seem believable within the lore that book has, or within the universe it’s created, then it’s completely fine with me.’*

*(P4N) ‘I get slightly annoyed if I read a fantasy book and they set up rules for that universe and then they break the rules, that really annoys me’*

Participants in both groups re-read favoured texts. Participants tended to re-read non-fiction for deeper understanding and fiction for repeated enjoyment. For both groups, re-reading, particularly fiction, provided comfort during difficult times:

*(P90A) ‘I call these set of books my old jumper books… that you put on to feel kind of safe and warm, they’re my books that I turn to when I need nurturing and need comfort.’*

*(P58N) ‘when you are feeling a bit down, or perhaps something bad has happened, you sometimes want the comfort of something familiar’*

*Group Differences*

Specialised interests were a key motivator for autistic participants, and were more nuanced and in-depth than general interests described by neurotypical participants. Reading, primarily non-fiction, helped eleven autistic participants to further engage with their specialised interests:

*(P71A) ‘the last few years now I’ve been really interested in the history of why we eat the way we do, and how we used to eat two-hundred years ago…so it’s not just cook books, it’s how the food landscape has evolved.’*

Additionally, eight autistic participants described past education experiences as a barrier to reading. For these participants educational reading demands made reading feel unenjoyable. Three participants felt this had created a barrier to the enjoyment of classic literature:

*(P98A) ‘there are a lot of classics that I really love, but I think also, some of them have sort of been ruined by me having read them in school’*

For the neurotypical group, physical and digital social opportunities were a unique barrier to reading. This resulted in preferences for alternative medias such as TV that enabled a shared social experience. In comparison, reading was viewed as solitary entertainment that prevented socialisation:

*(P21N) ‘reading tends to be an exclusive thing I think you just read and you might as well say to the other person “well, don’t bother me.’’’*

When looking at fiction preferences, five autistic participants found overly-realistic texts to be a barrier to enjoyment, something that was not reported by neurotypical participants. This was because over-realistic texts were seen as a barrier to escapism, and had resulting negative effects:

*(P1A) ‘It’ll go too realistic and get too grim, I don’t mind grim stuff or dark stuff it’s just when it has that element of realism it feels like it hits too close to home.’*

**3.2.2. Text Investment**
*Group Similarities*

Participants reported varied levels of immersion, such as hyper-focussing and transportation. Transportation and resulting escapism were particularly a feature for fictional texts resulting in immersive reading experiences that permitted vicarious enjoyment:

*(P60A) ‘I want to be taken to that other place, feel what they’re feeling, experience it as though I’m experiencing it in real life.’*

*(P35N) ‘sometimes I will think I’m travelling together with the character… just like I experience the same situation as the character.’*

Internal representations were described as important for transportation maintenance. These primarily consisted of visual and auditory representations, and were consistent with individual processing styles. When representations were hard to form, participants described using facilitators that made texts easier to represent and follow. Facilitators included real-life exemplars, such as people and places known to participants, and external aids such as media tie-ins:

*(P36A) ‘My sister got me the Game of Thrones books, and I really struggled to follow who was saying what…we watched an episode and I went back and read it, and it was a lot easier to read.’*

*(P109N) ‘when I read a place description, I generally find I relate it to a place I already know’*

*Group Differences*

It was clear that immersion posed more difficulties for autistic participants, with eight reporting barriers, compared to just one neurotypical participant. This seemed to be due to difficulties for these autistic participants in disconnecting from the external environment. Although neurotypical participants did report environmental barriers, these were short-term, context-dependent factors. In comparison, the autistic participants described general long-term barriers:

*(P90A) ‘I can never, ever, ever disengage from where I am, ever…there is always a little tiny bit of me like “right, but you’re still in the moment here.”’*

*(P41N) ‘I can’t read on the train, I can read on the tube as daft as it sounds, because the sound of the tube just completely drowns out everything else’*

Both groups described sometimes being so absorbed in reading that real-life necessities were overlooked. However, this seemed to be of a higher intensity for autistic participants. This resulted in reduced contextual awareness for five autistic participants, raising important vulnerability considerations:

*(P77A) ‘if I become transported into a book then I’m not going to be able to hear if somebody says something frightening, or they might steal my pocketbook if I’m not watching.’*

Due to these more invasive life impacts, five autistic participants imposed control behaviours to reduce impacts:

*(P97A) ‘I make sure that I block particular websites that I want to spend time on; ‘cos otherwise I’ll be pretty engrossed in reading but I have my work to do.’*

**3.2.3. In-Text Social Understanding**

*Group Similarities*

Social and emotional understanding while reading was evident across groups, with only six autistic and three neurotypical participants reporting difficulties. Specifically, both groups reported empathic experiences, with ten autistic and fourteen neurotypical participants explaining this further:

*(P20A) ‘I do often empathise a lot with what a character’s thinking of doing, even if it’s not necessarily what I would do.’*

*(P4N) ‘it’s that whole idea of creating empathy and understanding people have had completely different lives to the life that I’ve had.’*

Taking theperspective of characters was also frequently reported by participants across groups. This included the ability to switch between different character perspectives, resulting in deeper social and emotional understanding:

*(P122A) ‘it can help you get a better understanding of the overall situation, because you’ve got the different characters and how they’re reacting to things’*

*(P59N) ‘she’ll take very different characters and write their point of view…that really helps because you’re not just seeing it from one side.’*

Explicit description within texts was used by participants across groups to understand social and emotional aspects of texts, such as character perspectives. Indirect cues were also used, particularly where explicit description was unavailable, including word choices and sentence structure:

*(P94A) ‘even if it’s not sort of spelt out explicitly, word choice will tell you a fair bit about how the character’s reacting’*

*(P135N) ‘Sometimes it can be silence in the spaces between, sounds not necessarily expressions or facial expressions, it can be something else.’*

Participants also reported personal identification with texts which was often important for enjoyment. Characters and people within books were a common focus:

*(P91A) ‘I do feel a connection with them, but it’s more if they’ve done something or had something similar happen to them that’s happened to me.’*

*(P58N) ‘it’s nice to know others have done or experienced things that perhaps you have as well.’*

Eight autistic and six neurotypical participants desired representation of their demographic identities. However, participants also found the difference of others in texts to be of interest. Nine participants from each group reported an interest in personal stories:

*(P82A) ‘I read Reddit.com, and this is because I find that it’s kind of the most unfiltered way to get people’s stories’*

*(P27N) ‘I like to see how people’s lives have gone, or how they’ve gotten on, or what they’ve done’*

*Group Differences*

Some general social aspects of texts were consistently difficult for seven autistic participants*.* In particular, character intent was difficult for ten autistic participants; however, two found difficulties diminished upon becoming regular readers:

*(P122A) ‘when I first started getting in to my reading I didn’t really get any of it, and after a while you pick up the tropes and things and start going “oh, this character’s on a heroes’ journey,” and you can start predicting it from that.’*

While six neurotypical participants reported some difficulty with anticipating character intentions*,* these difficulties were mostly contextual and infrequent. Only one neurotypical participant had a general intent difficulty similar to what was common amongst autistic participants.

Only one autistic participant described being unable to achieve empathy for characters. Three autistic participants actively sought empathy, with one feeling guilty when empathy was absent:

*(P1A) ‘you read a really emotional story of like an Asylum seeker fleeing from war, and you’re like “ok that’s obviously a bad thing,” but you feel bad because it doesn’t hit you as hard as you feel it should.’*

For six autistic participants, empathising was easier if the experience was familiar. One participant was completely unable to empathise with unfamiliar situations and another actively researched novel situations to try and facilitate empathy.

Autistic participants additionally relied on inner monologue and character interaction dynamics to infer social and emotional content, something not reported by neurotypical participants:

*(P97A) ‘the other characters and their interactions, then that’s really helpful; because then it doesn’t leave me any guess work’*

In relation to identification, autistic individuals tended to identify with authors:

*(P82A) ‘I actually find it easier to connect with the author than I do their characters.’*

Additionally, interest in authors’ lives and experiences were more common amongst autistic participants, with fifteen showing some level of interest compared to five neurotypical participants.

Fifteen autistic participants, compared to five neurotypical participants, found general character struggles to be relatable and useful. For one autistic participant, reading about struggles was a useful tool to identify and prepare for future personal struggles:

*(P113A) ‘somebody in a book, their parents are going to tell them they’re getting divorced then their parents might say “can you come over to the house, we need to have a talk?”…when my mum came over and seemed kind of upset and said “can you come over to the house we need to talk?” I instantly knew…it kind of helped me prepare for that situation.’*

In relation to identity representation, nine autistic participants felt under-represented, and felt that when autism was depicted it was misrepresented, with negative, stereotypical portrayals:

*(P113A) ‘they’re often male characters, and they often are like the stereotypical awkward autistic person with zero social skills.’*

Some autistic participants had additional minority identities, including gender, age, belonging to the LGBTQ community, class and mental health, that they felt were also under-represented. While the issue of representation of minority identities was present for neurotypical participants, this was less profound due to the majority of narrative perspectives aligning with their neurotype.

**3.2.4. Reading as a Social Learning Device**

*Group Similarities*

Ten neurotypical and twelve autistic participants reported no explicit real-world social learning benefits from reading. However, both groups reported peripheral social improvements as a result of reading, this included vocabulary, humour and tone. An additional peripheral improvement was character investment, which served as a social and emotional connection for eight neurotypical and nine autistic participants:

*(P63A) ‘I feel like I’m becoming friends with the characters… when I read it back, it’s like meeting an old friend of mine.’*

*(P35N) ‘each character has their own personality and style, and I can take this story and they are real friends for me’*

This was more important for the autistic group, as connections were supplementary to real-life socialisation and alleviated social connection difficulties.

Both groups had mixed opinions about literature and poetry texts. Common barriers included language difficulties that made reading too effortful. However, participants who enjoyed poetry and/or realist literature felt they were more representative of societal issues. Additionally, both groups found enjoyment from analysing literature and poetry:

*(P63A) ‘the classics…they used to have a lot to analyse in them, and I like how the language is in them.’*

*(P27N) ‘I prefer rhyming poetry and how people match the words’*

*Group Differences*

Reading resulted in more social outcomes for autistic participants, with seventeen, compared to ten neurotypical participants, finding reading helped their real-life social and emotional understanding:

*(P113A) ‘I look at the behaviour of people in books and the steps in that behaviour, and use that to kind of predict what steps people might do in real life.’*

Texts were described as an easier method for social learning by thirteen autistic participants, compared to three neurotypical participants, because it provided the luxury of time and back-and-forth reading for checking reflections and perspective-taking:

*(P63A) ‘I get to turn the pages around, and go back and forth if I don’t understand, so I get to read at a detailed level. I find it hard to do it in real life, because it’s happening more chronologically.’*

In comparison, neurotypical participants believed their social skills developed naturally through experience, using texts to learn about new situations.

When looking at intervention design, fourteen autistic participants mentioned a desire for social learning, however the autistic group had additional social considerations. Seven participants avoided social situations due to difficulties with face-to-face interaction and environmental sensory difficulties. Additionally, five participants emphasised the importance of alone time and shorter interactions:

*(P60A) ‘I don’t like to be too social for too long because it starts to be quite draining.’*

Group size was also important for four autistic participants who preferred one-on-one or small groups*.* Preparation was additionally important, with nine participants emphasising a need to have texts ahead of time.

Additionally, five neurotypical, compared to two autistic participants, stated a preference for having poetry read aloud. When asked about the idea of participating in a reading aloud session many autistic participants were uncomfortable:

*(P60A) ‘I’m not so comfortable with the idea of being read to because in my mind that’s what you have for children’*

However, eight liked the idea of audiobooks or audio files, due to improved control over auditory information:

*(P63A) ‘if I had this audio file, I can replay it, or replay parts that I didn’t really hear.’*

Five disliked the idea of listening instead of reading regardless of method.

**4. Discussion**

**4.1. Summary of Findings**

This study aimed to examine the differences and similarities between autistic and neurotypical adults in (1) reading habits and preferences; (2) social understanding within texts; (3) the social outcomes of reading; and (4) intervention considerations. Relative findings between groups are discussed in Sections 4.1.1. to 4.1.4 in relation to previous research.

**4.1.1. Reading Habits and Preferences**

Both groups read frequently and generally read fiction for escapism, reading non-fiction for learning purposes. This expands on Barnes’ (2012) findings, showing that, when given the option, autistic people enjoy fiction and non-fiction equally. This also adds to findings of fictional preferences amongst autistic children (Armstrong, Paynter & Westerveld, 2019; Davidson & Ellis Weismer, 2018), showing fiction can be enjoyed by autistic individuals of all ages. This questions the assumption that a preference for fact over fiction is characteristic of autism (Baron-Cohen et al., 2001). The interview data suggests that autistic participants use factual books to engage with specialised interests, further explaining Barnes’ (2012) findings of an autistic preference for factual non-fiction. However, here it was clear that autistic participants also enjoyed personal stories. In short, the inherent social nature of fiction (Mar & Oatley, 2008; Zunshine, 2011) and its use for enjoyment and learning by autistic participants, challenges the simple E-S notion of an autistic empathy deficit (Baron-Cohen, 2009).

Additionally, autistic participants preferred science-fiction and fantasy for fiction, in contrast to the neurotypical preference for literary or crime fiction. Autistic participants required consistent rules for fantasy, seemingly consistent with the idea of systematic processing in autistic people (Baron-Cohen, 2009). However, the same need for consistency applied to neurotypical readers here too. The preference for science-fiction and fantasy dispels concerns that autistic people may struggle with reality suspension and imagination (Barnes, 2012; Ten Eycke & Müller, 2015). Rather, some autistic participants found over-realistic fiction content difficult. Additionally, both groups desired transportation into a narrative world, showing that the simulative and immersive experience afforded by fiction (Mar & Oatley, 2008) is sought out and enjoyed by autistic readers.

**4.1.2. Social Understanding Within Texts**

Contrary to proposed autistic social deficits (Baron-Cohen, 2008), both groups reported social and emotional understanding while reading. Specifically, both groups reported empathic and perspective-taking skills while reading. This lived experience data contrasts with the mindblindess theory and egocentric explanations of autistic perspective-taking (Baron-Cohen, 1997). Instead, these findings support the double empathy idea that autistic people have different perspective-taking approaches (Milton, 2012). The self-other blurring afforded by reading could permit autistic people to implement their own perspectives to understand and relate to social information (Koopman & Hakemulder, 2015). Therefore, the additional information provided in texts (Oatley, 2016) may help to overcome real-life barriers autistic people encounter when trying to understand neurotypical perspectives (Milton et al., 2018).

However, autistic participants did report more difficulties with social and emotional understandings. This was primarily around intent, and is therefore likely to reflect the double empathy problem (Milton, 2012), due to the under-representation of autistic narratives in fiction. This under-representation was highlighted by autistic participants, who felt further misrepresented if they belonged to other minority groups. This could be particularly important, given the proposed significance of personal experience in relation to narrative contexts (Mumper & Gerigg, 2019). However, both groups still identified with people and contexts in texts. Autistic participants in particular showed identification with character struggles and increased empathy with situations that felt familiar. Therefore, under-representation may not bar identification and subsequent investment. Interestingly, autistic participants showed more interest in authors’ intent and background compared to neurotypical participants. This focus on author intent may reflect the use of higher-order cognitive empathy to extract author perspectives from texts (Zunshine, 2011).

**4.1.3. Social Outcomes of Reading**

The autistic group especially found reading to be a useful social learning tool. This shows that the suggested social learning values of narrative contemplation can extend to autistic readers (Mar & Oatley, 2008; Mar et al., 2009). These findings were evident regardless of whether the participants reported reading classic literature, challenging the view that literature is needed to support social outcomes (Koopman & Hakemulder, 2015). Additionally, some participants across groups reported simulated friendships with characters, consistent with Merga’s (2017) findings that readers gain friendship connections from books. This could, at least temporarily, improve feelings of loneliness for autistic people (Mazurek, 2014). Books also acted as social catalysts within real-life friendships because, in both groups, text choice was influenced by others’ recommendations. This indicates another way reading could support friendships for autistic people (Sedgewick et al., 2016).

**4.1.4. Intervention Considerations**

Both groups expressed mixed opinions about reading poetry and classic literature. The most common issues were to do with older and metaphoric language posing comprehension challenges. The autistic group were asked about shared reading design considerations for future reading interventions. Findings emphasised the importance of preparation and the provision of relevant materials and discussion topics ahead of time. Social concerns were also expressed including face-to-face contact, which was felt to be less challenging in smaller groups and for shorter durations. These considerations suggest that the current shared reading group designs may need to be refined so that interventions become more like conventional small group book clubs. These adjustments are important as autism-based interventions should be both accessible and adapted to individual needs (Milton & Moon, 2012). Another key concern was that some of the autistic readers expressed discomfort at being read to, a key component of shared reading (Longden et al., 2015). However, findings show audiobooks, or smaller audio files, may provide an increased feeling of control, reducing processing demands to an acceptable extent for autistic participants.

**4.2. Limitations and Future Research**

As participants in this research study were volunteers, they were likely to be more avid readers. This was a particular issue for neurotypical participants, who were mostly recruited through the University and reading-based locations. Therefore, any generalisations to the wider population are limited. Furthermore, the quantitative summaries and explorations within this study were designed to further explore the current sample, rather than providing generalisable results. While this study has provided qualitative data to expand on the findings of Barnes (2012), larger scale quantitative data is needed to explore the accuracy of the non-fiction preference assumption amongst autistic individuals. The qualitative data presented here does however, warn against the over-simplification of autistic socio-cognitive and emotional profiles as encapsulated in dominant deficit-based theories (Baron-Cohen et al., 2001). Additionally, the current study only included autistic participants with co-occurring learning disabilities, if the disability was unrelated to reading and writing. This exclusion of individuals with significant reading and writing disabilities further limits generalisations.

This study used a retrospective questioning technique so that individuals were answering questions about their past or typical reading habits and preferences. Future research in this area should therefore seek to explore proactive text responses, similar to shared reading paradigms (Longden et al., 2015).

Although current findings provide a base understanding of the general reading habits of autistic adults, more research is needed before interventions can be designed. In particular, further exploration is needed to consider how narrative exploration could aid neurotypical understanding of autistic adults’ perspectives. The data also highlighted a need to adapt shared reading group interventions to enable autistic adults to get the most out of reading texts with others.

 **5. Conclusions**

In conclusion, the findings of this study contest prior assumptions that autistic individuals dislike fiction (Baron-Cohen et al., 2001). The findings agreed with and expanded on Barnes (2012), by showing an equal preference for both fiction and non-fiction in the autistic adults included in this research. These findings also critique prior over-simple assumptions to do with empathic and ToM difficulties in autistic people (Baron-Cohen, 1997). Participants across groups demonstrated affective empathic text responses, as well as an ability to take the perspective of characters. In this research it was found that adult autistic readers showed an in-depth appreciation for narrative literature, with resulting emotional investments and wider social understanding becoming possible. This, together with findings about social learning experienced by autistic participants, shows that reading is a potentially advantageous supportive intervention for autistic adults wanting to build their social confidence. Furthermore, reading could be an important tool for double empathy interventions, to improve mutual social understanding between autistic and neurotypical groups (Milton, 2012) and as a means to reduce loneliness. However, further research is needed to explore how reading could be implemented in a double empathy paradigm.

As one participant put it:

*(P71A) ‘I often feel like I say things and I’m making myself perfectly clear, and I’m not being understood in the slightest. So, if there was some way you could use reading…I’d be willing to give it a go.’*

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1. This article uses identity-first language (i.e. autistic) as preferred by the autistic community (Kenny et al., 2016) [↑](#footnote-ref-1)
2. Cronbach’s alpha values were 0.95 for the AQ and 0.67 for the QT. As the QT is used for data summary, this is not of particular concern for this paper. [↑](#footnote-ref-2)