How do autistic students do in the eyes of their peers? Non-autistic judgments about the academic experiences of autistic and non-autistic university students, based on brief samples of behaviour.

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Running Head: Perceptions of academic experience

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Abstract

Background: Previous research has found that people can make a variety of judgments about others based on brief samples of their behavior such as judging their social favorability and whether they wish to socialize with them. Non-autistic people frequently perceive autistic people more negatively than non-autistic people, although we do not fully understand the real-world consequences of this perceptual bias. This study extends previous work by investigating these perceptual biases within a real-world context: university.

Method: Non-autistic university students (N=25) watched short, candid video clips of autistic and non-autistic people. Participants rated different aspects of the stimuli model's academic experience, focusing on their motivation to study, academic success, grades, and happiness at university.

Results: Across all measures, non-autistic participants judged the academic experience of autistic models more negatively than non-autistic models, perceiving lower academic motivation, success, grades, and happiness at university.

Conclusion: These results demonstrate a consistent negative bias that autistic students may face from their peers at university. We discuss the importance of these results in terms of autism stigma, and the potential consequences for improving inclusivity at university.

Keywords: Autism; Person Perception; Academic Performance; University.

Community Brief

Why is this an important issue?

The number of autistic students entering university is higher than ever before, but recent evidence suggests that their academic outcomes are poorer than those of non-autistic students. For instance, 60% of autistic students do not complete their university studies, compared to a UK average discontinuation rate of 6.7%. Understanding the barriers that autistic students face is important for understanding where they might need additional support.

What was the purpose of this study?

We designed this study to investigate how non-autistic students view their autistic peers.

What did the researchers do?

The researchers used short, silent video clips of autistic and non-autistic people while they were thinking about an emotional experience. We showed these video clips to 25 non-autistic student participants, who made a variety of academic judgments about them. Participants did not know the diagnosis of the people in the video clips.

What were the results of the study?

Despite not knowing the diagnosis of the person in the video, participants judged autistic people more negatively than non-autistic people for all judgement types. Specifically, participants rated autistic students as having lower academic motivation, success, happiness, and grades at university.

What do these findings add to what was already known?

This study provides striking preliminary evidence that non-autistic peers perceive autistic students as less academically capable. This finding highlights an important social barrier that might impact

autistic student success at university. These findings emphasize the importance of creating a more inclusive and supportive environment for autistic individuals in Higher Education.

What are potential weaknesses in the study?

In this study, we did not know what the true academic performance of the autistic and non-autistic students was. So, we could not distinguish whether our participants were picking up on something true to life, or if they were making general negative judgements about autistic people. We need to complete further work to figure out which of these is more correct. Another weakness is that our sample of non-autistic students was small, and we did not test whether their perceptions of autistic people might differ depending on their knowledge about autism or other personal characteristics. Finally, no autistic people helped design, test, or interpret this study.

How will these findings help autistic adults now or in the future?

These findings can help autistic adults by raising awareness of the negative judgments operating within university settings. Further work needs to examine the impact of these negative judgments on academic performance, and to identify ways of altering biased perceptions to promote inclusive university environments.

Background

Research on social disability in autism has been dominated by the medical model, which positions the disability within autistic individuals themselves. Recently, non-autistic people have begun to appreciate the impact of contextual factors on outcomes for autistic people. An important theory in this area is the Double Empathy Problem[1,2] which reconceptualises social disability in autism as being relational in nature. It proposes that, due to fundamental differences in perceptions and experiences of the world, there is a "disjuncture in reciprocity" between autistic and non-autistic people, which makes cross-neurotype interactions problematic for both parties, with failures in mutual understanding and empathy being common. While both autistic and non-autistic interactional partners contribute to these difficulties, the impact is disproportionately negative for the autistic partners due to their being the minority group within society.

There is a small but growing body of empirical evidence that is consistent with predictions of the Double Empathy Problem. Non-autistic people find it more difficult to interpret behaviour of autistic than non-autistic others[3,4], while information transfer is superior between same-neurotype than mixed-neurotype pairs[5]. More generally, non-autistic people rate autistic others more negatively than non-autistic others on a range of social favourability traits (e.g. likeability), and report having less intention to interact with them[6].

These negative perceptions and misperceptions might impact outcomes in multiple spheres of life for autistic people. One context where autistic individuals have experienced relatively poor outcomes is Higher Education. Autistic students are less likely to finish Higher Education[7], and receive lower grades on average than their non-autistic counterparts [8]. Autistic students also report feeling stressed, isolated, anxious, and depressed at university [9]. Research also highlights that some non-autistic university students exhibit autism stigma[10] and autistic individuals are "othered" and dehumanised, including within university contexts[10 11]. Thus, negative peer attitudes could contribute to difficulties that autistic students face at university.

While previous research has provided evidence of negative attitudes towards autism as well as generally poor first impressions of autistic individuals[6,12–14], there is also some evidence that these negative impressions may extend to impressions of autistic people's academic abilities. For example, some studies have found that non-autistic people judge autistic individuals as less intelligent than their non-autistic peers[15–17], although others have found no group difference[6,18]. Therefore, further research is warranted to understand whether autistic individuals are judged more negatively in relation to academic achievement and success.

This question is important within an academic setting because if peers perceive autistic students as being less academically competent (regardless of the reality), they may be less likely to want to collaborate with autistic students on group work or include them in shared learning activities such as study groups. This could then result in autistic students having lower attainment because they miss out on opportunities to learn with and from others. Friendships with peers at school are positively related to academic motivation and performance [19,20] while social exclusion is negatively associated with grades at secondary school [21]. At University, great importance is placed on peer learning as "students learn a great deal by explaining their ideas to others and by participating in activities in which they can learn from their peers" [22]. Furthermore, there is a link between academic achievement and structure and size of study groups [23]. Thus, examining other students' judgments of the academic experience of autistic students will help us understand whether this may be a barrier to success. This study examines the peer judgments that autistic and non-autistic people receive in a university context. Previous research suggests that autistic people struggle at university, and others may judge them as less intelligent based on first impressions, thus we aimed to explore the nuances of negative biases related to academic experiences. The main objective of this study is to ascertain whether negative peer judgments are a barrier for autistic students at university. 25 non-autistic participants watched brief videos of autistic and non-autistic people (herein described as models) and made judgments about the models' academic experience at university. Participants judged the model's future academic success, motivation to study,

happiness at university, and average grades, based on brief video samples of behaviour. We chose to focus on these aspects of academic life as previous research suggests that autistic university students may experience difficulties in each of these domains[24], but we do not know whether a negative bias persists and/or contributes to these difficulties. We hypothesised that participants would judge autistic models more negatively than non-autistic models on each of these dimensions of academic experience. We further explore whether any negative bias is domain-general, or whether it is specific to judgements about academic attainment (success and grades) or academic experience (motivation and happiness).

Method

Participants

Twenty-five non-autistic university students (4 males and 21 females) aged between 18 and 34 (M = 23.84 years, SD = 5.30) participated in this study and volunteered through an online recruitment system. To take part, participants needed to be a current university student (undergraduate or taught postgraduate) and self-report no diagnosis of autism. A sensitivity analysis revealed that this sample size is powered to detect a medium effect at 80% power (critical t = 2.06). Participants gave written consent to take part and received course credit for participation. The researchers did not record specific data on race, ethnicity, and socioeconomic status for ethical reasons. The study received ethical approval from the School of Psychology Ethics committee at the University of Nottingham.

Materials and Measures

Stimuli

The researchers used pre-existing stimuli from a previous study in this experiment[25]. 18 stimuli models (9 autistic, 9 non-autistic) each provided four candid video clips to give a global

impression their behavior (see Supplemental Information for further details). All stimuli were silent and non-interactive.

Measures

Participants responded to the following questions for each model: Do you think this person will be successful in their academic life? (yes/no); Do you think this person is motivated to study? (yes/no); What average grades do you think this person has? (1st/high 2.1/mid 2.1/low 2.1/high 2.2/mid 2.2/ low 2.2/ 3rd); Do you think this person is happy at university? (yes/no). Participants selected the most appropriate response from the options given. The success, motivation, and happiness questions were subjective judgements that allowed participants to operationalize the concept for themselves. The grades question was an objective assessment of academic performance. The response options for the grades question refer to the possible degree outcomes in the UK degree classification system. A 1st corresponds to the highest possible award and a 3rd corresponds to the lowest passing grade. All participants were UK students who are familiar with this system.

Procedure

Researchers did not tell participants that this was a study about autism, and they remained naive to this aspect of the experiment until the debrief. Participants viewed the short video clips, presented on PsychoPy3, and rated each model on different facets of their academic experience. Each participant viewed a different randomised trial order. In each trial, four video clips of a single model simultaneously played in a loop (see Figure 1). Whilst the videos were playing, participants responded to the questions in a fixed order. When participants had rated all the models, the researcher debriefed the participants about the purpose of the study and asked whether they had a diagnosis of autism. The entire study took approximately 25 minutes.

Data Scoring and Analysis

The data are available on the Open Science Framework (https://osf.io/mzjgc/?view_only=3bbc16de0a874d80a90e30a8bfc566d2). Researchers coded academic success, motivation to study, and happiness at university as 0 (no) or 1 (yes). They then calculated each participant's proportion of 'yes' responses for autistic and non-autistic models separately. Scores could range from 0-1, with higher scores indicating more positive judgements. Researchers coded grade judgements numerically, ranging from 1 to 8, such that a higher score indicated higher perceived performance. They then calculated mean grade judgments for autistic and non-autistic models. These data were normally distributed, so researchers used parametric paired-samples t-tests to compare mean judgements of autistic and non-autistic models.

Results

Figure 2 illustrates the subjective judgements of academic experience. Participants judged non-autistic models as more successful at university than autistic models, $t(24) = 3.15$, $p = .016$, Bonferroni corrected, $d = .63$. They also judged non-autistic models to be more motivated to study than the autistic models, $t(24) = 3.70$, $p = .004$, Bonferroni corrected, $d = .74$. Participants rated non-autistic models as happier at university than autistic models, $t(24) = 5.73$, $p < .001$, Bonferroni corrected, $d = 1.15$. Finally, they perceived non-autistic models to have higher grades ($M = 5.49$, $SD = 0.11$) than the autistic models ($M = 4.88$, $SD = 0.17$), $t(24) = 3.89$, $p < .001$, Bonferroni corrected $d = .78$.

Discussion

As hypothesized, participants perceived autistic models less favorably than non-autistic models in all aspects of their academic experience. Specifically, participants judged autistic people as having lower academic success, less motivation, and to be less happy at university. In addition, they judged autistic people to have lower grades on average than their non-autistic peers. Therefore, based on brief samples of behavior, non-autistic students made judgments that differentiated between autistic and non-autistic peers, despite having no knowledge of their diagnostic status.

These findings are consistent with the Double Empathy Problem and resonate with previous research demonstrating that non-autistic participants make less favorable judgments about autistic people compared to non-autistic people on a range of traits and behavioral intentions [6]. In particular. they build upon prior research that has shown non-autistic individuals make negative judgments regarding autistic people's intelligence[15–17]. However, they expand on previous research in that they demonstrate that negative judgments extend to perceptions of autistic people's success within an academic setting, and even to a measure as concrete as their academic grades.

These less favorable impressions could have specific consequences within the academic setting. Being perceived negatively may result in peer exclusion from activities such as group work or study groups. Indeed, autistic students have previously reported difficulties working in groups at university[24] and there is evidence that non-autistic students believe it is acceptable to exclude autistic students in the classroom, especially when a grade is at stake[26]. Given that peer learning is heralded as a successful way to learn[22], and is promoted and used increasingly within university settings[27], these findings expose a potential mechanism through which autistic students may be disadvantaged, relative to their peers. We acknowledge that further research is needed to determine whether there are causal links between negative peer judgments and autistic student achievement, but this work highlights the need for educators to exercise caution when embedding peer-learning within their curriculum, and to carefully review the inclusivity of their teaching practices.

While this study provides striking preliminary evidence that non-autistic students perceive autistic people as less academically motivated, successful, and happy by their non-autistic peers, we do not yet know the basis on which these judgments are made. Previous research suggests that autistic students do perform more poorly on average than neurotypical students[8] and self-report having low motivation to study[24] so it is possible that the participants detected genuine differences between the groups. As this study used pre-existing stimuli and we did not have information about

the models' true academic experience, we cannot determine whether negative perceptions are accurate or biased. If negative perceptions are accurate, then we should consider whether participants are accurate because models' academic ability is revealed in their behavior, or whether poor impressions of peers contribute to poorer academic performance. To begin to tackle these issues, future research should measure the actual academic status of the models by obtaining self-reported data. Future research should ideally use a prospective design to determine whether current negative impressions predict future academic outcomes.

This research does not address the complexities of real-world student interactions, including intersectionality between autism diagnosis and other protected characteristics (race, ethnicity, gender, and socio-economic status). Partly, this is due to a lack of available data from the stimulus models and participants in this instance, but also because these are complex issues that we cannot address in depth in simple cognitive experiments. Further work examining the impact of intersectionality in this field is warranted, but beyond the scope of this piece of research. The lack of involvement of members of the autistic community in this research is also a limitation. For instance, involvement of members of the autistic community would strengthen our understanding of the impacts of negative perceptions of peers within an academic context and ensure that the measures and behaviors sampled are those most relevant to academic outcomes for this population.

Another area of limitation is that we did not provide participants with definitions of the variables they judged; therefore, participants may have made their judgments based on different concepts of what those variables encompassed. This may be particularly the case for judgments about success, which we included as a holistic impression but could mean different things to different raters (e.g. degree attainment, grades, employability). It is possible that participants perceived the autistic models as facing more barriers in Higher Education and their judgments of success took account of this. Future research could provide a more specific definition of success or

ask participants to explain the reasons for their answers to better understand their interpretation of the question.

It is important to note that the movies used in our study had no sound and no interactive elements, because the participants were alone and engaged in thought when they were recorded. Therefore, we were not able to assess the contribution of auditory cues or social behaviour to the impressions that participants formed. In daily life, students will likely form impressions of their peers during social interactions, as well as through passive observation. Future studies should record stimuli during social interactions, to assess the impact of voice, speech patterns, and interaction styles on other's impressions of autistic students' academic experiences.

Further extensions of this work could examine the impact of diagnostic disclosure and knowledge of autism on judgments of academic experience. This would help to ascertain whether diagnostic disclosure will help students with their peer relations at university. Additionally, inclusion of an autistic participant group would provide information about whether this bias is mitigated within same-neurotype pairs and would provide an evidence basis for initiatives that build autistic student communities at university. However, as autistic students are often in minority, the judgments of non-autistic peers are likely to be more prevalent and impactful to their academic experience. An important line of future enquiry is to examine whether negative biases extend to educators, as this could potentially result in bias in assessments - at least in contexts where assessments are not blinded/anonymous. Prior research supports the notion that expectations of others, especially teachers, about the academic achievement of students can affect the actual level of academic performance in this way[28].

To conclude, this study reports a striking tendency of non-autistic university students to judge autistic students' academic experience negatively. While we do not yet fully understand the consequences of these judgements, it is important to raise awareness of this issue as there are

several routes through which these negative judgements may impact autistic university students, making Higher Education environments less inclusive and more difficult to navigate.

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Afaf Alhusayni: Methodology, Investigation, Formal Analysis. **Elizabeth Sheppard:** Conceptualization, Resources, Writing – Original Draft. **Peter Mitchell:** Conceptualization, Supervision. **Lauren Marsh:** Writing – Review and Editing, Supervision.

Conflict of Interest:

The authors declare no conflict of interest with respect to this research, authorship and/or the publication of this article.

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Figure Legends

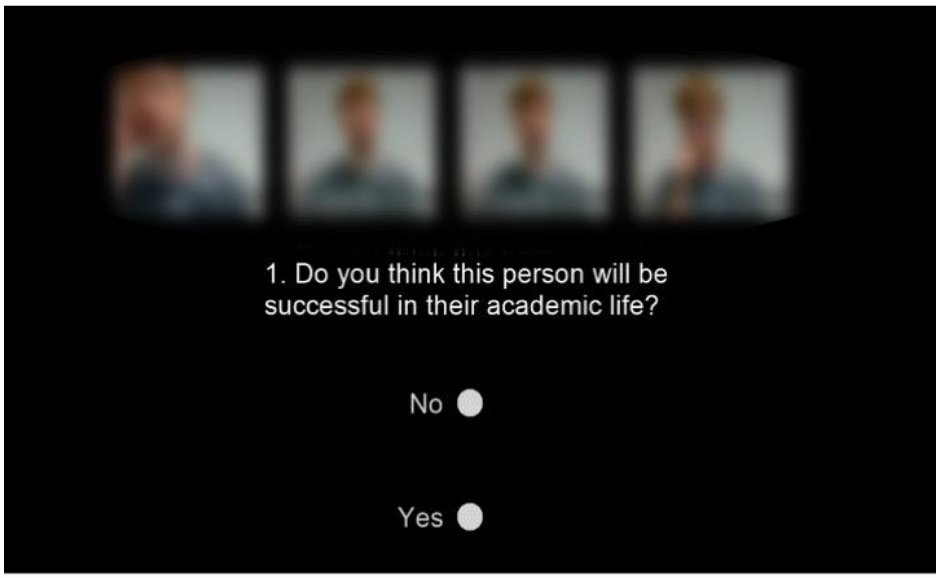

Figure 1: Illustration of a single trial with the success question and response options (videos blurred to protect target anonymity).

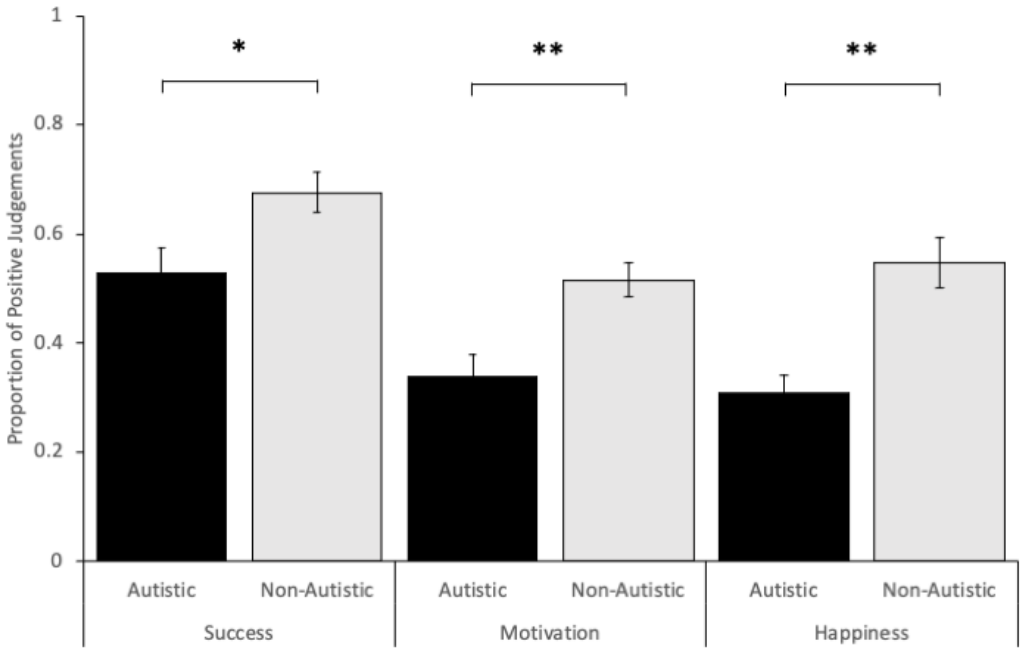

Figure 2: Proportion of positive judgements about academic success, motivation, and happiness at university of autistic and non-autistic models. Error bars represent +/-1 S.E.M. *p<.05, **p<.001.