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Exploring the Relationship between Traits Associated with Autism Spectrum Disorder (ASD) and the Detection of Fake News Headlines

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Presentation Plan

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1. Background

a) Defining fake news

b) Psychological characteristics and fake news detection

c) Autism Spectrum Disorder (ASD)

2. Small-scale exploratory study

a) Method

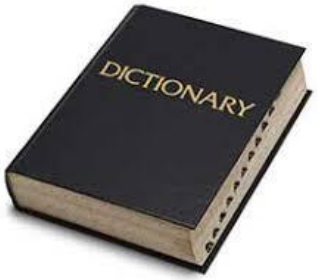
b) Results

3. Discussion

a) Summary

b) Limitations and future work

a) Defining fake news



Cambridge Advanced Learner's Dictionary (2018):

"false stories that appear to be news, spread on the internet or using other media, usually created to influence political views or as a joke"

Lazer et al. (2018):
"intentional fabrication of news to mimic real news content to mislead others"

b) Detection of fake news: demographic and psychological characteristics

Pennycook & Rand (2019) ‘cognitive psychological profile’

- individuals with a less analytical thinking style and those who believed information based on its conformity with their own ideology = poorer at detecting fake news

Bronstein et al (2019): do people believe in fake news as they ‘fail to think’?

- through analytical and open-minded thinking, people can help protect themselves from disinformation

c) Autism Spectrum Disorder (ASD)

ICD-11 (2018): lifelong neuro-developmental disorder

- affects approx 1% population, male to female ratio 2:1

ASD is a spectrum condition: many individuals with condition may share symptoms, but each individual has own unique set of symptoms

- individuals with traits associated with ASD may understand information and may perceive emotion in different ways

- may display inflexible patterns of behaviour, deficits in Theory of Mind, and / or deficits in ability to empathise (Baron-Cohen et al)

- <u>despite some researchers focusing on ‘deficits’, other research covers the positive abilities of individuals with ASD traits…</u>

Differences in decision-making

Hayashi et al (2008)

- individuals with ASD exhibit superior fluid intelligence (ability to solve novel problems and reason independently from previous knowledge), compared to a control group

Brosnan et al (2014)

- a more circumspect decision-making style, rather than jumping to conclusions

DeMartino et al (2008)

- rational and logical decision making

--> RQ1: Will individuals high in traits associated with ASD be better at spotting fake news?

Emotiveness a common feature

Molek (2013)
exaggeration, embellishment and use of emotive language often a prominent feature in fake news and clickbait

Chesney et al (2017): Highly affective content, using images and other visual cues to provoke interest, arouse emotion
- often forsaking accuracy of information presented

DeMartino et al. (2008): individuals with autism traits gave less attention to emotional context when making decisions, compared to those without autism traits

--> RQ2: Will individuals high in autistic traits be less affected by emotive content in fake news?

2. Small-scale exploratory study:

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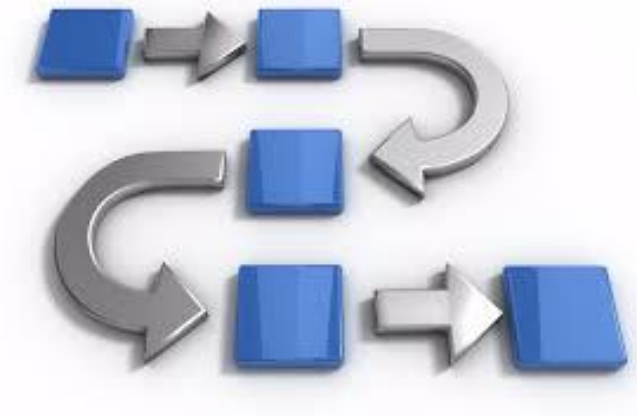
Two hypotheses:

H1: Individuals with higher levels of autistic traits will correctly identify more articles as being real or fake, compared to those with low levels

H2: The accuracy of detection will be different for individuals with low and high levels of autistic traits, depending on whether articles are emotive or non-emotive

a) Method:



Design

Materials

Participants

Procedure

Design

2 x 2 x 2 mixed factorial design

Within-subjects variables:

- article headline emotive or not emotive
- article headline real or fake

Between-subjects variable:

- high or low levels of autistic traits

Dependent variable:

- correct identification of fake / real news headlines

Materials

Autism-Spectrum Quotient (ASQ): Baron-Cohen et al (2001) to measure autistic traits in adults of normal IQ

Chosen as not used for clinical assessment or diagnosis

- used in many studies involving non-clinical populations

- Baron-Cohen et al. provide face and construct validity that it is a valid measure of five areas considered in ASD: social, communication, imagination, attention to detail and attention switching

- categorisation based on median split of data

Twenty article headlines with an accompanying image developed

- ten sourced from real news reports, ten were ‘fake news’ created for study

- images to evoke emotion or empathy (Chesney et al, 2017)
- images independently rated as either emotive or not emotive

- equal number in each category

Participants

Volunteer sample of 35 first and second year students

Mean age 20.7 years

3 male and 32 female

Rewarded with course participation credits

Procedure

Informed consent, age and gender collected

Each article displayed for as long as desired, participants were asked to decide whether it was real or fake

- asked for reasons for decision (analysis in progress)

Once all 20 articles displayed, participants completed ASQ

Participants debriefed and informed as to which articles were fake/real and the role of emotiveness

b) Results

A 2x2x2 mixed ANOVA statistical test

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Main effects:

Emotiveness (low / high) not significant ($F(1,33) = .90$, $p = .35$)

Level of autistic traits (low / high) not sig ($F(1,33) = .98$, $p = .33$)

--> H1 not supported

Article type (fake / real) significant ($F(1,33) = 5.89$, $p = .02$)

- real articles (M=3.2) detected accurately more than fake (M=2.57)

Interaction effects:

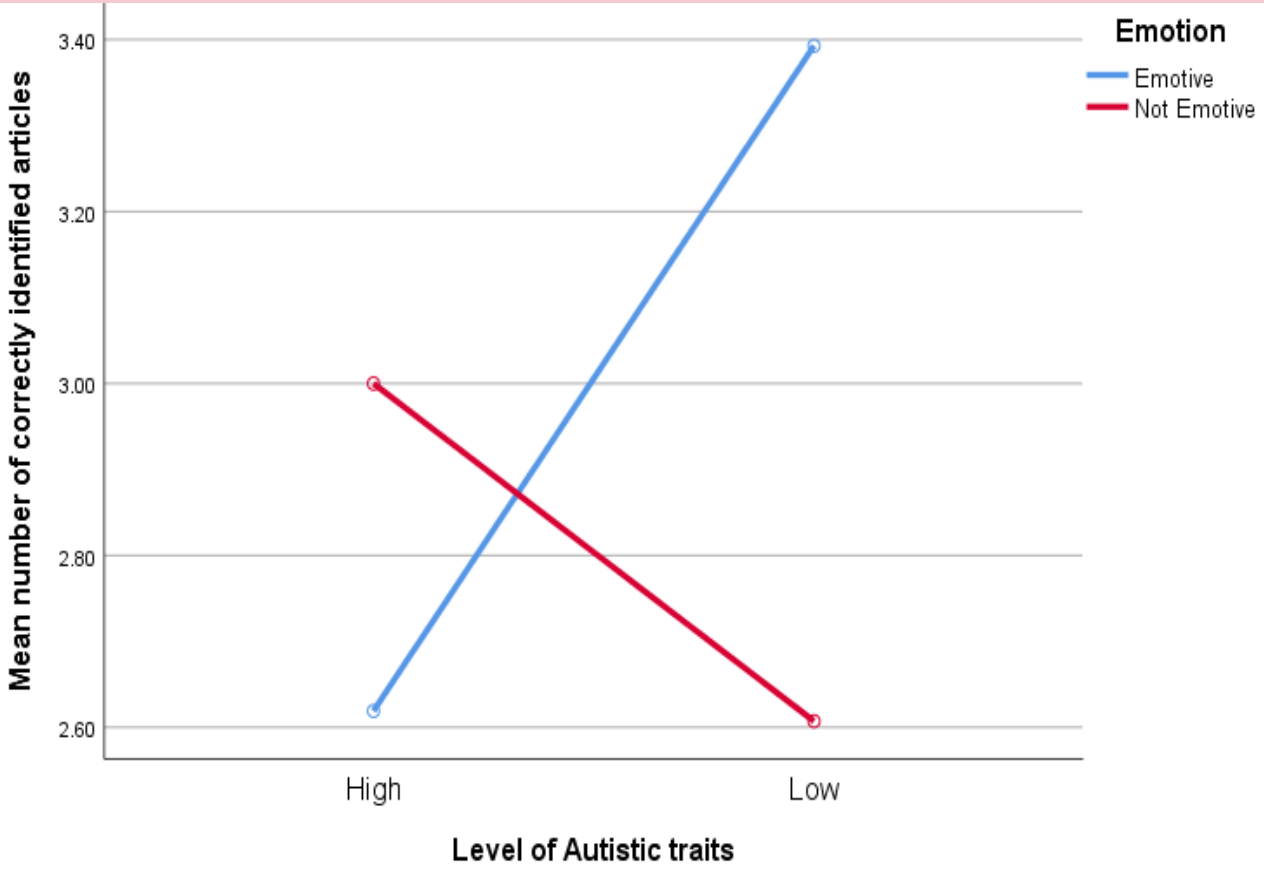
Emotiveness and level of autistic traits significant ($F(1, 33) = 7.50$, $p = .01$)

--> H2 supported

Emotiveness and article type significant $F(1,33) = 13.38$, $p < .01$

Article type and level of autistic traits $F(1,33) = .58$, $p = .63$

Fig 1. Sig interaction between emotiveness of articles and level of autistic traits (Supports H2)



For individuals with low level of autistic traits, article emotiveness significantly affected detection rates (high emotive articles correctly identified more than the non-emotive articles)

- high level of autistic traits, article emotiveness has little effect

3a) Summary

No significant main effects of ASD

- Hypothesis 1 rejected: level of autistic traits was not related to the correct detection of fake news

More real headlines detected correctly than fake (no hypothesis)

- current analysis identifying reasons given by Ps as to why they believed articles to be real or fake, and what features participants considered in making their judgements

Significant interaction in Fig 1 shows that

- Hypothesis 2 supported: that individuals with high levels of ASD are less biased by the level of emotiveness in news articles, compared to those with low levels of ASD

3b) Limitations and Further Research

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High level ASD group not clinically diagnosed
- recruit participants with a formal diagnosis and compare with neuro-typical participants

Use of a median split to divide low and high
- future study will compare only high vs low scorers on the AQ (no mid-level scores)

Small sample size and sample bias
- conduct a replication study with larger numbers
- balance gender (ASD more common in males)

Materials not very realistic
- use more realistic article headlines and full articles

Conclusions

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Results looks promising:

- interesting relationship between headline emotiveness, ASD and fake news detection
- further research needed

Results contribute to wider understanding of how psychological differences affect online judgements of deception

Thanks for listening ☺

Any questions?

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