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## **Abstract**

**Background.** Social perception is an important skill. One assessment that is commonly used to assess social perception abilities is The Awareness of Social Inference Test (TASIT) (McDonald et al., 2003). The only normative data available for this test is for Australian younger adults. Despite no normative data being available for British adults, the test is widely used in the UK with older and younger adults. There is a growing body of research that suggests that older adults have difficulty with skills associated with social perception. There is therefore a need to determine whether British adults and more specifically British older adults perform similarly to the Australian normative TASIT scores available in the manual.

**Aims.** To explore the differences between older and younger British adults' performance on TASIT and to determine whether younger and older British adults perform similarly to the data from Australian adults in TASIT manual.

**Methods & Procedures.** TASIT was administered to a total of 42 native British English speaking participants. The participants were split into two age groups 18-45 and 60-90. Comparisons were made between the two groups and the Australian data in TASIT manual.

**Outcomes & Results.** The younger British and Australian adults obtained similar scores on all parts of TASIT. The older British adults though, obtained significantly lower scores than the Australian younger adults on all parts of TASIT and when education was controlled for they obtained significantly lower scores than the British younger adults.

**Conclusions & Implications.** The findings are discussed in light of previous research which has found that older adults are worse than younger adults at social

inferences. The findings of the current study suggest that caution should be used when using TASIT with older British adults to assess social perception abilities.

### **What this paper adds?**

*What is already known on the subject?*

The Awareness of Social Inference Test (TASIT) (McDonald et al., 2003) is commonly used in the UK to assess the social perception abilities of adults. There is a growing body of research which suggests that older adults have difficulties with social perception.

*What this paper adds?*

This study found that older British adults obtained significantly lower scores on TASIT than younger British and Australian adults. The findings suggest caution should be used when using TASIT with older British adults.

**MAIN TEXT:**

Social perception is the key skill targeted by The Awareness of Social Inference Test (TASIT) (McDonald et al., 2003) and it involves the integration of verbal language, non-verbal behaviours such as gesture and facial expression, and paralinguistic information such as intonation in order to determine the speaker's intention (Boice, 1983, Edinger and Patterson, 1983, Hess, 2005). Impaired social perception is commonly associated with a number of impairments including traumatic brain injury (TBI) (McDonald and Flanagan, 2004), dementia (Rankin et al., 2009) and right hemisphere stroke (Kucharska-Pietura et al., 2003). As such, social perception assessment often forms part of a speech and language therapist's evaluation of communication skills. TASIT is the only published assessment available that specifically assesses social perception. The normative data presented in TASIT manual is derived from a primarily young Australian population (average age 22.9 years, range 14-60) because, the authors argue, the majority of people who experience severe TBI are in this age range (McDonald et al., 2003) and the test was originally designed to be used with this population. Despite there being no published normative data for British adults, this assessment is recommended for use in the UK (Tyerman and King, 2008) and is widely used to assess both younger and older adults' social perception. There is therefore a significant need to explore how older and younger healthy British adults perform on TASIT.

The frontal and temporal lobes have been implicated as having an important role in social perception (McDonald and Flanagan, 2004). Evidence for this comes from studies which have found that people who have neurological conditions which affect the functioning of the frontal and temporal lobes, such as traumatic brain injuries (McDonald and Flanagan, 2004) and fronto-temporal dementia (Lough, Gregory and

Hodges, 2001), have difficulties with social perception and the skills associated with social perception. A number of physical changes in the frontal lobes are associated with typical aging (Hess, 2005) and these changes have been used to explain the decline in a number of cognitive domains such as reasoning and memory (see Salthouse, 2004 for summary). If the frontal lobe typically declines with age and the frontal lobe plays an important role in social perception, then this would suggest that older adults will have difficulty with social perception.

Social perception involves a number of different skills including interpretation of non-literal language, understanding humour and recognising emotions. The impact of aging on these skills has been explored by a handful of researchers.

Zanini et al. (2005) compared older adults' and younger adults' performance on the Italian version of Bryan's (1995) Right Hemisphere Language Battery. While this assessment does not specifically assess social perception, it does include tasks that have a social perception component such as interpretation of non-literal language, including humour, and the ability to make inferences. Zanini et al. (2005) found that the older adults obtained lower scores than the younger age group on this assessment.

Studies that have investigated the impact of aging on skills commonly associated with social perception such as emotional identification from intonation, emotional identification from facial expressions and theory of mind provide a more mixed picture. Orbelo, Testa & Ross (2003) found that older adults were worse than younger adults at identifying emotions based on audio-recordings. In contrast, MacPherson, Phillips, & Della Sala (2002) found that older adults performed

similarly to younger adults when identifying emotions from photographs of facial expressions. In their study of the impact of aging on theory of mind, Happé, Winner and Brownell (1998) found that while the ability to answer non-mental questions (requiring inference about physical causation) decreased with age, aging did not affect accuracy on questions requiring theory of mind (an inference about another person's mental state).

While the impact of aging has been explored in relation to some of the skills associated with social perception, only two published studies have explored older adults' performance on the commonly used social perception assessment, TASIT.

Rankin et al. (2009) investigated the performance of ninety participants on the sarcasm and sincere communication sections on TASIT. The participants included 13 healthy controls and 77 participants with a range of neurological conditions. The mean age of participants was 61.8. They found that performance was unimpaired for all groups for interpreting sincere communication. The group of participants with semantic dementia had difficulty interpreting sarcastic communication. All other groups performed within normal limits for this section.

In order to determine the ability of older adults to recognise emotions, Moraitou et al. (2013) administered part one of TASIT to 208 Greek participants. They found that older adults were not as accurate at decoding emotions, with the exception of happiness that seemed to be relatively preserved. However, it is important to note that because this study was carried out in Greece and TASIT uses video stimuli in English, the sound was turned off. Therefore this study only explored the impact of

aging on ability to decode emotions from visual cues. It also only explored the impact of aging on part one of TASIT. There is therefore a need to explore the impact of aging on ability to decode emotions from both visual and audio stimuli and to explore older adults' performance on parts two and three of TASIT. There are no published studies that have explored British older adults' performance on the entire TASIT.

In the current study, TASIT was administered to younger and older British adults. Comparisons were made between the two groups of participants collected in this study on all parts of TASIT. Comparisons were also made between the data collected in this study and the Australian data in TASIT manual.

## **Method**

Ethics approval was gained from School of Health Sciences Research Ethics Committee XXXXXX<sup>1</sup> University XXXX.

## **Participants**

Twenty-one older adults aged 60-90 (M=68.9, STDEV=7.3) and 21 younger adults aged 18-45 (M=30.6, STDEV=6.2) were recruited to take part. The younger adults had had significantly more years of formal education (M= 15.1 years, STDEV= 2.4), than the older adults (M=12.8 years, STDEV=2.5),  $t(40)=3.14$ ,  $p<0.05$ . It is typical in Britain for the younger population to have a greater number of years of education than older adults due to the vast increase in numbers of university places available in recent years (Greenaway and Haynes, 2003).

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<sup>1</sup> Full details to be provided after anonymous review process

The participants were all living independently in the community and were recruited from a variety of social groups in the Manchester region, UK. These were mainly sewing, embroidery and craft clubs. All clubs were aimed at older adults. All participants who were included in the study had spent their childhoods in the United Kingdom, had English as their first language, had no previous history of neurological impairment and rated their hearing and sight as good or higher with or without correction (glasses or hearing aids). All participants obtained scores of 25 or above on the Mini-Mental State Examination (Folstein et al., 1975) indicating that they did not have a cognitive impairment.

The scores of the participants from the present study were compared to the neurologically healthy participant scores published in TASIT manual. In TASIT manual, there is data for Form A for 88 neurologically healthy participants (45 male). They were aged 14-60 years of age (mean=24.6, S.D= 9.2); six had nine years or less education, 53 had 10-12 years of education and 29 had 13 or more years of education. Only a range of years of education were provided. Specific years of education were not provided.

### **Procedure**

Parts one, two and three of TASIT Form A were administered by a qualified speech and language therapist to groups of no more than five participants. The participants watched the DVD clips on a portable 19" TV in a quiet room. The participants were asked to mark their answers on an adapted version of TASIT response form in which answers were removed.

For part one, the participants watched video clips of people talking either towards the camera or in pairs. Participants were asked to select the emotion which they thought was being portrayed in the video. Parts two and three involved watching a video clip of an interaction and then answering four probe questions that specifically related to each interaction. These questions assessed the person's understanding of whether the character in the video was being sarcastic and also the person's ability to determine the character's motives (e.g. are they lying to protect the other person's feelings?). It was explained by the speech and language therapist that after each clip there were four questions, and that for each they would need to provide one of three answers: *yes, no or don't know*. For clips in which two or more actors appeared, the speech and language therapist clarified which of the actors the participant should focus on.

## **Results**

A one-way analysis of covariance (ANCOVA) was used to compare part one, part two and part three scores for the older and younger British adults. A covariate was included to partial out the effects of years of education. There was not a significant relationship between years of education and part one scores,  $F(1,39)=3.64, p>0.05$ , or part three scores,  $F(1,39)=3.92, p>0.05$  but there was for part two scores  $F(1,38)=7.79, p<0.05$ . After controlling for years of education, there was a significant difference between the younger and older adults' test scores on all three parts of TASIT: part one,  $F(1,39)=10.26, p<0.05$ , part two  $F(1,39)=5.3, p<0.05$  and part three  $F(1,39)=24.66, p<0.05$ . Figure 1 shows the means and standard deviations for each group and subtest.

-----Insert Figure 1 about here-----

A one sample t-test was used to compare the Australian normative data in TASIT manual to the younger and older adults from this study on each part of TASIT. As specific years of education were not available for the Australian data, this could not be considered in the comparison. However, it is important to note that the Australian healthy adults were similar to the older adults in terms of years of education, in that the majority had 10-12 years of education. There was not a significant effect of culture for the younger age group for any part (part one:  $t(20) = 0.004$ ,  $p > 0.05$ ; part two:  $t(20) = 0.747$ ,  $p > 0.05$ ; part three  $t(20) = 0.6485$ ,  $p > 0.05$ ). The older British age group however, performed significantly worse than the younger Australian group on all parts (part one  $t(20) = 5.609$ ,  $p < 0.05$ ; part two  $t(20) = 4.526$ ,  $p < 0.05$ ; part three  $t(20) = 6.556$ ,  $p < 0.05$ ). See Figure 1 for a comparison of the Australian data and the scores from the two groups of participants in this study.

## **Discussion**

This study investigated the effects of age and culture on performance in social perception tasks of TASIT. There was no significant difference between the younger British participants and the Australian participants from the original study (McDonald and Flanagan, 2004, McDonald et al., 2003). The older British participants performed significantly worse than the Australian younger participants on all parts of TASIT. When education was controlled for, they also performed significantly worse than the younger British participants on all parts of TASIT.

These results are in line with findings from Zanini et al. (2005), who found that older adults obtained lower scores than younger adults on the Italian version of Bryan's (1995) Right Hemisphere Language Battery. While the Right Hemisphere Language

Battery differs to TASIT in that it does not specifically assess social perception, many of the tasks contain a social perception component such as interpretation of non-literal language including humour and the ability to make inferences. These results also support the findings of Moraitou et al. (2013) who found that older Greek adults obtained lower scores on part one of TASIT. The current study differed to that of Moraitou et al. in that the participants watched the video stimuli with the sound turned on and the participants were English speaking. The findings of the current study and those of Zanini et al. (2005) and Moraitou et al. (2013) suggest a general decline in older adults' social perception abilities.

The findings relating to part one of TASIT, in which the older adults were worse at identifying emotions from the video clips, do however contrast with the findings from the study by MacPherson et al. (2002), in which 30 participants aged between 61 and 80 years were required to make a judgement about another's emotional state based on a still picture in which a facial expression was depicted. In the current study, TASIT required participants to make judgements about another's emotional state based on a video, which is a more realistic scenario. Although the difference between the findings of the current study and that of McPherson et al., could have been simply due to the difference in stimuli (i.e. the use of video clips as opposed to still images) it could instead be due to an over reliance on prosody to determine emotional state.

All parts of TASIT require a participant to use prosody in order to either make judgements about someone's emotional state (part one), or to make judgements about someone's intended meaning by differentiating between literal language use and sarcasm (parts two and three). The reason why the older adults obtained lower scores

than the younger adults in the present study is uncertain but it could have been the use of Australian actors and more specifically the use of ‘Australian prosody’.

Alternatively, it could reflect a general decline in older adults’ ability to use prosody in social perception tasks. Orbelo et al. (2003) also found that there was a decline with age in a person’s ability to make inferences about another’s emotional state based on prosody. However, this explanation does not account for why the older participants in the study by Moraitou et al. (2013) also had difficulties with part one of TASIT when the sound was turned off. Further research would be needed to determine whether the British older adults’ difficulties with these tasks in TASIT were due to age related changes or due to the impact of the use of Australian prosody.

It is not clear from this study alone if this decline in ability to make social inferences is due to age, culture or an interaction between all factors. This preliminary study suggests that this is an important area to research further, particularly in light of the fact that TASIT is the only published assessment available that specifically assesses social perception, there is no published normative data for British adults, but it is widely used to assess both younger and older adults’ social perception. Future research with a larger number of participants is needed to try and determine the underlying reason for the differences between the two groups. Either way, the findings of the study suggest that the Australian data in TASIT manual is not a suitable comparison when using TASIT with older British adults. Clinicians should be aware that a low score on TASIT by an older British client may simply reflect healthy aging rather than impaired social perception due to brain damage.

## **Conclusion**

The current study found that British older adults obtained significantly lower scores on TASIT than both younger British adults and the data on young Australian adults in TASIT manual. Further research with larger participant numbers is needed in order to investigate the reasons for these differences. Caution should therefore be used when using TASIT as a clinical tool with older British adults.

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