



# Queen Margaret University

## CLINICAL AUDIOLOGY, SPEECH AND LANGUAGE RESEARCH CENTRE

CASL's research portfolio was rated 2<sup>nd</sup> in the UK in REF 2014:  
92% world-leading or internationally excellent (across outputs, environment and impact).

### PhD Bursary Competition Clinical Audiology, Speech and Language Research Centre

Applications are invited for a research training bursary (i.e. A PhD plus Doctoral Certificate in Researcher Enhancement and Development). CASL Research Centre sits within the School of Health Sciences at Queen Margaret University, Edinburgh. Applications are invited on any topic related to CASL's current research, but our topics for 2022 bursary applications are:

- [BUR 22-14] **Personality Assessment from Voices: Judgment Validity and Signal Dynamics**  
(Dr Felix Schaeffler)
- [BUR 22-15] **Application of Ultrasound to Swallowing Assessment**  
(Dr Joan Ma)
- [BUR 22-16] **Aptitude or Attitude? Understanding Inter-individual Differences in Accent Adaptations**  
(Dr Sonja Schaeffler)
- [BUR 22-17] **Speech, Language and Communication Needs of Adults with Autistic Spectrum Disorder in the Criminal Justice System**  
(Dr Ann Clark)

Details of the centre's strategic goals are available on our [CASL website](#), along with links to current projects, publications, students and staff. Applications from qualified Speech and Language Therapists or non-clinicians are both welcome. The successful applicant will be working within a highly skilled team of subject experts in a world-class laboratory and will receive:

- full waiver of tuition fees.
- an annual stipend of £15,609 lasting 3 years for full-time study.
- a research budget of £2000 to cover project expenses and travel.

The deadline for applications is Friday 11 March 2022. [Visit our Bursary Competition web page for more information.](#)

[More information on CASL.](#) In addition to this bursary opportunity, CASL welcomes applications for co-supervision of students registered at other institutions or with external funding at any time. Self-funded and externally registered students would have more

flexibility in the topic of their research and should contact relevant potential supervisors, or Professor James M Scobbie, [jscobbie@gmu.ac.uk](mailto:jscobbie@gmu.ac.uk) to discuss an application.

## **Personality Assessment from Voices: Judgment Validity and Signal Dynamics**

Contact: Dr Felix Schaeffler (Speech and Hearing Sciences) or Dr Kristen Knowles (Psychology, Sociology and Education)

[BUR 22-14]

Humans attribute personality traits to other humans on the basis of short encounters, with some studies suggesting that judgements are made in less than a second (e.g. Todorov et al., 2009). Studies of physical appearance, especially faces, have shown that correlations between self and others' attributions are above chance level (Funder, 1980), lending support to the notion that these attributions do not only happen, but might have some accuracy (Little & Perrett, 2007). There is also extensive evidence that personality attributions, whether accurate or not, have far-reaching consequences for subsequent social interactions (e.g. Little et al., 2011).

Research on personality cues derived from voices has so far largely focused on vocal trustworthiness and dominance. The types of projects suggested here will extend this research to examine how voices can influence the attribution of a more various suite of characteristics. We will also pose critical questions as to whether these attributions are accurate, and how these may influence interactive social behaviours.

We would encourage candidates to explore the following pathways:

- a) How to assess personality? Current approaches often rely on quantitative ratings of voices of a certain personality descriptor (e.g. trustworthiness), but this could be extended to incorporate a scale of likelihood of taking specific social behaviours following listening to a voice – for example, asking the individual for directions, or trusting them to momentarily watch a personal item. Approaches like these would potentially increase the ecological validity of the judgment and might improve applications that rely on personality judgements and attributions.
- b) How are cues to personality attribution encoded in the voice signal? The voice signal is a highly dynamic signal that rapidly evolves over time and simultaneously provides linguistic, para-linguistic and extralinguistic information, often employing the same acoustic cues for all three aspects. Previous research by F Schaeffler and his colleagues (Mennen et al., 2012) has shown that long-term averages of acoustic parameters over stretches of speech are not sufficient to describe prosodic characteristics, and we would encourage candidates to explore various analytical options to increase our understanding of the dynamic qualities of voices which contribute to personality attribution. Approaches over and above acoustic analysis could include auditory-phonetic analysis (e.g. Vocal Profile Analysis, (Mackenzie-Beck, 2005), articulatory analysis (e.g. Ultrasound Tongue Imaging) or video capture (e.g. to analyse lip and jaw movement or address more general relevant aspects of face-voice-congruence).

Resources for this project include the QMU CASL recording studio, CASL video capture and Ultrasound Tongue Imaging facilities, the QMU Psychology research lab with audio-visual recording equipment, and prospective research subjects include professional voice over actors (via commercial partner The Voice Distillery Ltd), and the QMU student pool, including the QMU Psychology undergraduate research pool, and acting students from QMU Drama.

The topic cuts across the three CASL research threads:

- a) It addresses methodological issues relating to measures of personality and their acoustic, articulatory and/or visual correlates
- b) It has voice and speech treatment potential, for example in the context of transgender voice therapy

- c) It addresses important theoretical issues regarding individual variation in the context of para- and extralinguistic aspects of the speech signal.

The topic is a direct extension of F Schaeffler's work on acoustic voice analysis for health-related and voice-over assessment purposes (cf The Voice Distillery), and K Knowles's PhD work and subsequent outputs.

The bursary and the collaboration with The Voice Distillery would provide the candidate with added benefits over and above PhD-level research experience as the company would provide business mentoring, access to datasets and highly proficient voice-over artists, access to machine learning expertise as well as potential employment opportunities beyond the PhD bursary. The project will use largely non-invasive methods with non-vulnerable populations. We do therefore not expect particularly complex ethical issues arising from this project. Impact and public engagement opportunities will be provided through The Voice Distillery, and the company will also explore additional funding streams (e.g. Business Angel Investment) to support the project beyond in-kind contributions.

#### References

- Funder, D. C. (1980). On seeing ourselves as others see us: Self-other agreement and discrepancy in personality ratings. *Journal of Personality*, 48(4), 473–493.  
<https://doi.org/10.1111/j.1467-6494.1980.tb02380.x>
- Little, A. C., Jones, B. C., & DeBruine, L. M. (2011). Facial attractiveness: Evolutionary based research. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 366(1571), 1638–1659. <https://doi.org/10.1098/rstb.2010.0404>
- Little, A. C., & Perrett, D. I. (2007). Using composite images to assess accuracy in personality attribution to faces. *British Journal of Psychology*, 98(1), 111–126.  
<https://doi.org/10.1348/000712606X109648>
- Mackenzie-Beck, J. (2005). Perceptual Analysis of Voice Quality: The Place of Vocal Profile Analysis. In W. J. Hardcastle & J. Mackenzie-Beck (Eds.), *A Figure of Speech* (pp. 285–322). Lawrence Erlbaum Associates.
- Mennen, I., Schaeffler, F., & Docherty, G. (2012). Cross-language differences in fundamental frequency range: A comparison of English and German. *The Journal of the Acoustical Society of America*.  
<http://scitation.aip.org/content/asa/journal/jasa/131/3/10.1121/1.3681950>
- Todorov, A., Pakrashi, M., & Oosterhof, N. N. (2009). Evaluating Faces on Trustworthiness After Minimal Time Exposure. *Social Cognition*, 27(6), 813–833.  
<https://doi.org/10.1521/soco.2009.27.6.813>

#### See also

- Schaeffler, F., Eichner, M. & Beck, J. (2019) Towards ordinal classification of voice quality features with acoustic parameters. In: Proceedings of The Conference on Electronic Speech Signal Processing, TU Dresden, 6-8 March 2019. ESSV, pp. 288-295.  
<https://eresearch.qmu.ac.uk/handle/20.500.12289/10224>
- Penton-Voak, I., Cahill, S., Pound, N., Kempe, V., Schaeffler, S. & Schaeffler, F. (2007) Male facial attractiveness, perceived personality, and child-directed speech., *Evolution and human behavior*, vol. 28, , pp. 253-259  
<https://eresearch.qmu.ac.uk/handle/20.500.12289/2077>

- Miley, E., Schaeffler, F., Beck, J., Eichner, M. & Jannetts, S. (2021) Secure account-based data capture with smartphones – preliminary results from a study of articulatory precision in clinical depression. *Linguistics Vanguard*, 7(s1):20190015  
<https://eresearch.qmu.ac.uk/handle/20.500.12289/10230>
- Mennen, I., Schaeffler, F. & Docherty, G. (2012) Cross-language differences in fundamental frequency range: a comparison of English and German, *Journal of the Acoustical Society of America*, vol. 131, , pp. 2249-2260  
<https://eresearch.qmu.ac.uk/handle/20.500.12289/2622>
- Knowles, K. K. (2018) The evolutionary psychology of leadership trait perception. In: Senior, C. (ed.) *The facial displays of leaders*. Cham: Palgrave Macmillan, pp. 97-121.  
<https://eresearch.qmu.ac.uk/handle/20.500.12289/9171>
- Knowles, K. K. (2018) The evolutionary psychology of leadership trait perception. In: Senior, C. (ed.) *The facial displays of leaders*. Cham: Palgrave Macmillan, pp. 97-121.  
<https://eresearch.qmu.ac.uk/handle/20.500.12289/9925>

## **Application of Ultrasound to Swallowing Assessment**

Contact Dr Joan Ma (Speech and Hearing Sciences)

[BUR 22-15]

Ultrasound has the potential to be a useful and safe clinical tool for the assessment of swallowing and disorders of swallowing in both adult and pediatric populations. A PhD on the application of ultrasound to swallowing into clinical practice has the potential of making a practical impact on NHS service provision.

Ultrasound can provide a more accessible tool in supporting clinical decision making, which is less invasive and does not involve radiation exposure. It will also reduce the economic cost of healthcare as the equipment is highly portable and can be carried out as outpatient or at home visits. This could lead to better management of dysphagia, reducing the impact of dysphagia on quality of life, and minimising the healthcare cost from inappropriately managed swallowing problems, including severe outcomes such as hospitalisation and death.

This PhD project will capitalise on several innovations originating from the long-standing collaboration at QMU between CASL researchers and spin-out company Articulate Instruments Ltd. (instrumental hardware, software and clinical protocols). It aims to turn ultrasound into a practical clinical application.

Applicants will join a team of dysphagia and speech researchers using ultrasound. Shared interests in instrumentation, clinical application and motor control theory provide a rich environment for research in this area. In addition, there is a possibility of cross-discipline collaboration, such as with food science from the technological perspective, with a strong profile in their evaluation of the sensory characteristics of food texture and its oral processing.

The recent consensus exercise carried out by the International Ultrasound Working Group had highlighted the need for research in different areas. These range across reliability and validity testing, training protocols and competencies, to patient and public involvement. Any of these could be potential research areas of focus for this PhD project..

### **References**

- Allen, J.E., Clunie, G.M., Slinger, C., Haines, J., Mossey-Gaston, C., Zaga, C.J., Scott, B., Wallace, S., & Govender, R. (2021) Utility of ultrasound in the assessment of swallowing and laryngeal function: A rapid review and critical appraisal of the literature. *International Journal of Language and Communication Disorders*. 56(1): 174-204.
- Allen, J.E., Clunie, G.M., Ma, J. K-Y., Coffey, M., Winiker, K., Richmond, S., Lowell, S & Volkmer (in press 2022) Translating Ultrasound into Clinical Practice for the Assessment of Swallowing and Laryngeal Function: A Speech and Language Pathology-Led Consensus Study.

Chen, Y.-C., Hsiao, Ming-Yen, Wang, Yi-Chian, Fu, Chih-Pin & Wang Tyng-Guey (2017) Reliability of Ultrasonography in Evaluating Hyoid Bone Movement. *Journal of Medical Ultrasound*, 25(2): 90-95.

Hsiao, M.-Y., Wu, C.-H., & Wang, T.-G. (2021). Emerging Role of Ultrasound in Dysphagia Assessment and Intervention: A Narrative Review. *Frontiers in Rehabilitation Science*.

Ma, J. K-Y., & Wrench, A.A. (under review). Automated assessment of hyoid movement during normal swallow using ultrasound.

#### See also

- Ohkubo, M., & Scobbie, J.M. (2018). Tongue shape dynamics in swallowing using sagittal ultrasound. *Dysphagia*, 34(1), 112-118.  
<http://eresearch.qmu.ac.uk/5411/>
- Eshky, A., Ribeiro, M.S., Cleland, J., Richmond, K., Roxburgh, Z., Scobbie, J.M., & Wrench, A.A. (2018). UltraSuite: a repository of ultrasound and acoustic data from child speech therapy sessions. *Proceedings of The 19th Interspeech, Hyderabad*. [Paper 1736]  
<https://eresearch.qmu.ac.uk/handle/20.500.12289/5399>
- Wrench, A. & Balch, P. (2015). Towards a 3D Tongue model for parameterising ultrasound data. *Proceedings of the 18th ICPhS, Glasgow*.  
<https://eresearch.qmu.ac.uk/handle/20.500.12289/3963>
- Cleland, J., Wrench, A., Scobbie, J. & Semple, S. (2011). Comparing articulatory images: An MRI / Ultrasound Tongue Image database. *Proceedings of the 9th International Seminar on Speech Production*.  
<https://eresearch.qmu.ac.uk/handle/20.500.12289/2477>

## **Aptitude or Attitude? Understanding Inter-individual Differences in Accent Adaptations**

Contact: Dr Sonja Schaeffler or Prof James M Scobbie (Speech and Hearing Sciences)

[BUR 22-16]

Anyone living in Scotland is regularly exposed, to some degree, to Scottish as well as English accents. Yet very few can convincingly switch between a Scottish and an English accent when asked to do so. The reasons for this are likely to be complex and could range from a lack of 'talent' for producing an unfamiliar sequence or version of speech sounds (aptitude) to an unwillingness to 'put on' the less desirable accent (attitude). The aim of this PhD project is to disentangle this complex interaction of motor implementation and social cognition in a series of experiments. The topic is ambitious and interdisciplinary in nature, drawing on models and findings in the disciplines of phonetics, sociolinguistics and psychology, and will require a strong empirical basis.

The specific focus of the doctoral project proposal should be determined by the applicant and will depend on their experience and the skills they wish to develop. The applicant could, for example, focus on 'aptitude' and develop an Ultrasound-Tongue-Imaging experiment to probe articulatory talent, while surveying speakers' ability to implement naturally occurring variation (e.g., features that typically distinguish a Scottish from an English accent). They could also focus on 'attitude' and develop a suitable survey exercise alongside a large-scale online data collection and/or develop a priming experiment. They could even utilise novel variation in artificially created accents and investigate aptitude and attitude in a cultural transmission study. Irrespective of the route a successful application would take, important outcomes of this project will be the development of new methodology, and a contribution to a better understanding of accent acquisition and use.

The proposed PhD project ties in with a larger programme of research at CASL. The overarching aim is to find out why and how speakers arrive at the way they speak (faced with so many competing options in their environment), and why some are 'better' than others at adapting the way they speak when the situation requires. Findings may also inform our clinical work, which seeks to modify speech production during Speech and Language Therapy.

### **References to relevant CASL research**

- Hall-Lew, L., Friskney, R., & Scobbie, J. M. (2017). Accommodation or political identity: Scottish members of the UK Parliament. *Language Variation and Change* 29(3): 341-363.
- Lawson E., Scobbie J. M., Stuart-Smith J. (2014) A socio-articulatory study of Scottish rhoticity. In: Lawson, R. (ed.) *Sociolinguistics in Scotland*. London: Palgrave Macmillan, pp. 53-78.
- Mennen, I., Scobbie, J., deLeeuw, E., Schaeffler, S., Schaeffler, F. (2010). Measuring Language-Specific Phonetic Settings. *Second Language Research* 26 (1): 13-41.

- Schaeffler, S., Scobbie, J., Drummond, C. (2020). Sounding out the Extremes of Bi-dialectal Edinburgh Adolescents. BAAP 2020, York.
- Schaeffler, S. (2006). *Are Affective Speakers Effective Speakers? Exploring the Link Between the Vocal Expression of Positive Emotions and Communicative Effectiveness*. PhD thesis.
- Stuart-Smith, J., Lawson, E., & Scobbie, J. M. (2014). Derhoticisation in Scottish English: a sociophonetic journey. In Celata, C. and Calamai, S. (Eds.) *Advances in Sociophonetics*. Amsterdam: John Benjamin, pp. 57-94.
- Thomas, S., & Scobbie, J. M. (2015). Mixed accents: Scottish children with English parents. In Mompean, J. A. & Fouz-González, J. (Eds.) *Investigating English*. London: Palgrave Macmillan, pp. 83-104.

## **Speech, Language and Communication Needs of Adults with Autistic Spectrum Disorder in the Criminal Justice System**

Contact Dr Ann Clark (Speech and Hearing Sciences)

[BUR 22-17]

Autism is a neurodevelopmental disorder, affecting more than 1% of the population and is characterised by impairments in social communication and restricted, repetitive patterns of behaviours (SIGN, 2016). Difficulties with social interaction, communication, rigidity and additional sensory needs (APA, 2013) can mean that without the right environmental supports and strategies in place, adults with ASD can be particularly vulnerable if they come into contact with the law. The stark reality that as an adult with autism spectrum disorder (ASD), there is a higher chance of a traumatising or re-traumatising experience in the CJS due to additional needs being unrecognised and inadequate support given (Ashworth & Tully, 2016). A meta-analysis of the prevalence of people with ASD in the criminal justice system reported a wide range from 3%-27% (King and Murphy, 2014). There are a number of methodological reasons behind this range, but what these figures show is the rate of prevalence of ASD is considerably higher in the prison population than in the general population. They further strongly suggest that professionals working within the CJS encounter adults on the autism spectrum either knowingly or unknowingly at some point during their career. In fact, the National Autistic Society suggests that autistic adults are seven times more likely to come into contact with the police than their neurotypical peers. By age 21, approximately 20% of young people with autism had been stopped and questioned by police and nearly 5% had been arrested (Rava et al, 2017).

Without reasonable adjustments and consideration of autistic features, miscommunication and misunderstanding may occur (Beardon, 2008). This may put autistic adults at a significant disadvantage and risk when it comes to legal decision making, receiving just outcomes within the CJS and the right to a fair trial (Murrie et al. 2002). As a result, current legislation such as the Equality Act (2010) exists to ensure that all public services have a legal responsibility to ensure anyone with a disability, including those with an autism diagnosis, are not discriminated against and receive equal treatment to their neurotypical peers.

Up to 90% of criminal justice professionals are lacking in training, awareness and adequate understanding of autism (Browning & Caulfield, 2011). This lack of knowledge not only occurs amongst staff in a prison setting (Robinson et al., 2012) but also in preceding contexts at the time of arrest, in police interviews and court hearings (Cooper & Allely, 2017). Almost 400 police officers reported their experiences with ASD and a lack of appropriate training and time constraints were given as the main reasons impacting on planning and preparation to support autistic clients (Crane et al., 2016). Chown, (2009) found 70% of police officers in England and Wales reported having no formal training in ASD. Similarly, we found in our research with police officers in Scotland that a majority would welcome additional training on SLCN (MacRae and Clark, 2020). Legal professionals within the CJS would like to receive additional training to determine appropriate adjustments to support clients with communication needs (Ewin, 2016). There is a clear need for non-specialist tools and interventions to be assimilated into police practice without them having a reliance on specialist intervention or other authorities to support young people with SLCN (MacRae & Clark, 2020).

Whilst it is important to obtain opinions and experiences of professionals in the criminal justice system, it is only by hearing the voices of the autistic community that advances can be made to support this population. There has been minimal work evaluating the experiences of autistic adults in the CJS Crane et al. (2016) found that parents and autistic adults themselves were dissatisfied with their experiences in the CJS. Participants reported discrimination, inappropriate physical environments leading to increased anxiety and breakdown in communication, lack of clarity/explanations and unmet needs.

Therefore, the aim of this study is to explore and document the experiences and perspectives of autistic adults as well as perspectives of the supporting professionals at each point of the justice pathway: from arrest, to questioning and sentencing.

This project, aiming to profile “the speech, language and communication needs (SLCN) of autistic adults in the Scottish Justice System”, has many complex challenges and offers many development opportunities for a doctoral student in research and impact generation. The topic is well motivated and fits in with a developing acceptance in the research literature that, in descriptive terms, such needs routinely affect the majority of autistic adults in contact with the justice system. The detailed linguistic characteristics of these communication difficulties support arguments that the individuals so affected are more likely to cause or be unable to avoid interpersonal interactions that escalate into illegality, and that SCLN negatively impacts educational, social and economic life outcomes. The project focuses on autistic adults, not just because their experiences are under-researched but because as individuals, they are likely to face needs in the CJS which are currently unrecognised and therefore by definition unmet. With a focus on empirical qualitative research with autistic adults and the professionals working with them, this project will illuminate the needs of this population, providing evidence for cognitive and social models of language use as well as more practically supporting more effective, evidence-based support, including that from the speech and language therapy profession.

The project will require careful ethical consideration around obtaining views of vulnerable adults in the CJS who likely have SLCN. Previous experience has shown that ethical approval requires to be gained not only from QMU but also from external agencies such as the Police Scotland. Dr Ann Clark is well-connected to the relevant gate-keepers, policy drafters, research specialists and advocates in this area, covering Scottish Government advisors, the Police, and the Justice System.

The project fits with a long-standing strand in CASL’s research strategy, and a successful applicant will join other doctoral and masters-level researchers exploring this general area.

With its focus on respecting the experiences of neurodivergent people, their inclusion on an equitable basis in our national justice system and how best they can be supported with genuineness and integrity, this project sets centrally within the QMU strategy of ‘valuing all contributions through a distinctive, open, collegiate, healthy and positive culture based on diversity, inclusivity and mutual respect across all activities and underpinned by integrity’.

By hearing the voices and lived experiences of autistic adults within the CJS, the project will be central in identifying and pinpointing areas of support for both professionals and autistic adults. Such areas of support include recognising and raising awareness of autism as well as speech language and communication needs (SLCN) to support autistic adults that come into contact with the law. The project therefore has great potential for far reaching and intensive impact, as it will identify training needs of the professional working within the criminal justice system and the perspectives of the autistic adults themselves on what they think would support them. Recommendations for best practice will be made to all relevant agencies.

## References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5*. 5th edn. Washington, D.C.
- Ashworth, S., & Tully, R. J. (2016). ASD In Forensic Settings: Hidden Populations Still Experience The ‘Diagnosis Crisis’. *British Medical Journal*.
- Beardon, L. (2008). Asperger Syndrome and perceived offending conduct: a qualitative study BEARDON, Luke Available from the Sheffield Hallam University Research Archive (SHURA) at: <http://shura.shu.ac.uk/7155/>
- Browning, A., & Caulfield, L. (2011). The prevalence and treatment of people with asperger's syndrome in the criminal justice system. *Criminology & Criminal Justice* : CCJ, 11(2), 165. doi:10.1177/1748895811398455
- Chown, N. (2009). Do you have any difficulties I might not be aware of? *International Journal of Police Science and Management*, 12, 256.

- Clark, A., Barrow, E., & Hartley, K. (2012). Unmet need in Scotland's Criminal Justice System. *Royal College of Speech and Language Therapist's Bulletin*.
- Crane, L., Chester, J.W., Goddard, L., Henry, L.A., & Hill, E. (2016). Experiences of autism diagnosis: A survey of over 1000 parents in the United Kingdom. *Autism*, 20(2):153-162. doi:10.1177/1362361315573636
- Cooper, P., & Allely, C. (2017). You can't judge a book by its cover: Evolving professional responsibilities, liabilities and 'judgecraft' when a party has Asperger's Syndrome. *Northern Ireland Legal Quarterly*, 68 (1), 35–58.
- Ewin, R. (2016). The vulnerable and intimidated witness: a study of the special measure practitioner. *Journal of Applied Psychology and Social Science*, 2 (1). pp. 12-40.
- King, C., & Murphy, G.H. (2014). A Systematic Review of People with Autism Spectrum Disorder and the Criminal Justice System. *Journal of Autism and Developmental Disorders*, 44, 2717–2733. doi.org/10.1007/s10803-014-2046-5
- MacRae, A., & Clark, A. (2020). Police officers' awareness of the Speech, Language and Communication Needs of Young Offenders. *Police Journal: Theory, Practice and Principles*, DOI: 10.1177/0032258X20968591
- Murrie, D., Warren, J., Kristiansson, M., & Dietz, P. (2002). Asperger's Syndrome in Forensic Settings. *International Journal of Forensic Mental Health*, 1, 59-70. 10.1080/14999013.2002.10471161.
- Rava, J., Shattuck, P., Rast, J., & Roux, A. (2017). The Prevalence and Correlates of Involvement in the Criminal Justice System Among Youth on the Autism Spectrum. *Journal of autism and developmental disorders*, 47(2), 340–346. <https://doi.org/10.1007/s10803-016-2958-3>
- Robinson, L., Spencer, M.D., Thomson, L.D.G., Stansfield, A.C., Owens, D.C.G., Hall, J., & Johnstone, E.C. (2012). Evaluation of a screening Instrument for Autism Spectrum Disorders in Prison. *PLoS ONE*, 7 (5), 1-8. doi: 10.1371/journal.pone.0036078.
- Scottish Intercollegiate Guideline Network. (2016). *Assessment, diagnosis and interventions for autism spectrum disorders*. Edinburgh: SIGN

#### See Also

- Clark, A., & Fitzsimons, D. (2018). Awareness of and Support for Speech, Language and Communication Needs in Children's Hearings. *Scottish Journal of Residential Child Care*, 17, 4.
- Clark, A., & Fitzsimons, D. (2016). Unidentified and unmet: Hidden speech, language and communication needs of looked-after children and young people in Scotland. *Royal College of Speech and Language Therapist's Bulletin*, May 2016, pp 16-17.
- Fitzsimons, D., & Clark, A. (2021). Pausing Mid-Sentence: An Ecological Model Approach to Language Disorder and Lived Experience of Young Male Offenders. *International Journal of Environmental Research and Public Health* 2021, 18(3), 1225.
- Rutherford, M., Forsyth, K., McKenzie, K., McClure, I., Murray, A., McCartney, D., Irvine, L., & O'Hare, A. (2018) Implementation of a practice development model to reduce the wait for Autism Spectrum diagnosis in adults, *Journal of Autism and Developmental Disorders*, 48 (8), pp. 2677-2691.
- Rutherford, M., Singh Roy, A., Rush, R., McCartney, D., O'Hare, A., & Forsyth, K. (2019) Parent focused interventions for older children or adults with ASD and parent wellbeing outcomes: A systematic review with meta-analysis. *Research in Autism Spectrum Disorders*, 68:101450.