
Commentary

Beyond the classroom: a commentary on overcoming the challenges with conducting research in schools by using public engagement as a novel approach to data collection

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Abstract

Recruiting participants for psychological research is a well-known and frequently reported challenge associated with the research process. This is especially challenging when recruiting younger populations, often leading researchers to rely on educational settings for recruitment and data collection. This commentary explores the challenges of conducting research in schools, the potential drawbacks of this reliance, and proposes an alternative approach to address these challenges. We propose an alternative recruitment method utilising public engagement sessions with established groups, such as Scouting and Girlguiding communities, to facilitate data collection. This recruitment model has the potential to transform recruitment dynamics, overcome many of the barriers associated

with school-based testing and offer researchers an alternative pathway to optimise data collection in psychological research with young people.

Keywords public engagement; developmental research; methodology review; Scouting; Girlguiding

Key messages

- Testing in schools has been a popular method to conduct research with children, however, there are many limitations, and they may no longer be the most appropriate method to rely upon.
- We describe how public engagement events held in Scouting and Girlguiding communities could instead be used to conduct research, including suggestions regarding the method for how this can be implemented.
- Participating in public engagement events has benefits for both researchers and participants involved.

Conducting research in schools

Successful psychological research relies on recruiting large participant samples. Traditionally, schools have provided a convenient setting to access diverse groups of young people (Milnes & Kendal, 2012; Testa & Coleman, 2006). However, recruitment is frequently cited as the most challenging and time-consuming aspect of research (Lovato et al., 1997; Prescott et al., 1999; Watson & Torgerson, 2006). This is particularly true in developmental research, where recruiting young participants involves additional barriers including cooperation with gatekeepers and obtaining parental consent (Campbell, 2008; Rice et al., 2007).

Failure to recruit sufficient samples threatens the validity of research findings (Hoenig & Heisey, 2001), with time-sensitive funding or reporting deadlines potentially exacerbating these risks, especially if an underpowered study compromises integrity or must be abandoned altogether (Gul & Ali, 2010; Torgerson et al., 2001). For developmental researchers working within narrow age windows, delays can further disrupt the intended scope and timing of data collection if required age groups are inaccessible.

Schools offer a valuable context for investigating children's social, psychological and cognitive development, providing insights into learning, intervention and support strategies. Additionally, their naturalistic setting supports research on peer dynamics and behaviour outside the home (Abraham & Kerns, 2013; Baines et al., 2009). School-based studies also ease socioeconomic and logistical burdens on caregivers, enabling broader participation (Gaias et al., 2020; Sugden et al., 2013), and help recruit regionally representative samples (Alibali & Nathan, 2010). Access to children from diverse backgrounds is vital for examining how culture, ethnicity and socioeconomic status shape development (Sugden & Moulson, 2015). Despite these advantages, challenges tied to school-based research are seldom discussed systematically. This commentary addresses such challenges and offers an alternative model.

Afterschool clubs

Given the increasing demands on schools and the logistical barriers associated with conducting research within them (discussed later on), it is reasonable to question whether schools remain optimal settings for recruitment and delivery of research. Exploring alternative models is therefore essential. One such approach is utilising public engagement within after-school clubs to recruit and conduct research.

Research has found that around 66 per cent of young people attend extracurricular clubs (Department for Culture, Media & Sport, 2024). These activities support mental health, learning and social development (Boelens et al., 2022; Magaji et al., 2022; Mahoney et al., 2005). Specifically, Scouting and Girlguiding groups provide structured development opportunities, including for children from

disadvantaged backgrounds who may have fewer opportunities. Notably, 434 new Scout sections have opened in areas ranked in the bottom 30 per cent of the Index of Multiple Deprivation (Scout Association, 2023), reflecting efforts to improve access and inclusion.

Afterschool clubs offer greater flexibility than schools in the activities they can host (Chişiu, 2013), making them well-suited for developmental research. Crucially, participation does not interrupt core academic learning, meaning children are not disadvantaged by participating. As many clubs are volunteer-run, designing simple, interactive research activities can reduce the planning burden, encourage collaboration and make data collection more accessible and engaging.

This commentary outlines the challenges of recruiting and conducting developmental research in UK schools and describes an alternative to mitigate many of these challenges. Specifically, recruiting and collecting data within public engagement sessions with local afterschool clubs such as Scouting and Girlguiding communities. This method helps researchers foster mutually beneficial opportunities for researchers, participants, gatekeepers and the local community. It also supports knowledge exchange and engagement with STEM subjects by embedding data collection within enjoyable activities that promote curiosity. The following section expands on these ideas by contrasting the challenges of conducting research in schools with the more flexible infrastructure offered by Scouting and Girlguiding settings.

Conducting research in schools

Identifying and accessing participant groups

One of the first challenges when conducting developmental research in schools is identifying appropriate institutions to approach. While permission is essential, gaining it can be both time-consuming and difficult (Milnes & Kendal, 2012). For early career researchers, this is often compounded by limited networks or professional standing, which may affect confidence and access (Oates & Riaz, 2016). Schools commonly decline requests due to time constraints, perceived burden, concerns about student wellbeing or a lack of alignment with institutional priorities (Brevik, 2013).

Requests are often ignored when initial contact is made with the wrong staff member, making it vital to identify the appropriate point of contact. This task is complicated by variations in schools and district structures. While permission is typically granted by the headteacher, some schools, specifically in larger districts, require approval from governing bodies (Bonnell et al., 2018). Researchers may also need consent from classroom teachers (Midford et al., 2000). Contacting the wrong member of staff can be seen as a misuse of time and reduce the likelihood of participation (Rice et al., 2007). Navigating this process often involves multiple rounds of communication, delaying timelines, especially when working across multiple sites (Alibali & Nathan, 2010).

The proposed public engagement model within Scout and Girlguiding communities departs from the hierarchical processes typical of the school-based recruitment often seen in psychological, developmental research. Instead, decision-making is centralised in a single group leader with authority to respond. This challenges the assumption, often implicit in developmental research, that access must be negotiated through bureaucratic, institutionally mediated routes (Alibali & Nathan, 2010). Studies involving Scouting and Girlguiding movements report significantly higher participation rates (Ievers-Landis et al., 2005), highlighting the connection between procedural simplicity and research feasibility.

Obtaining consent

Conducting research in schools also requires caregiver consent, and child assent, a time-consuming process for both researchers and teachers (Bonnell et al., 2018; Lamb et al., 2001; Lonergan & Cumming, 2017; Pincus & Friedman, 2004). Teachers typically become intermediaries to help obtain consent, which

can discourage involvement despite safeguarding intentions (Alibali & Nathan, 2010). Researchers may also encounter resistance from caregivers (Edwards et al., 2023), and the need to repeat this process across multiple schools to meet recruitment quotas.

By shifting data collection to public engagement sessions within Scouting and Girlguiding settings for instance, the administrative burden on teachers is therefore removed. Importantly though, this approach does not simply transfer responsibilities to other gatekeepers but gives researchers greater autonomy to liaise directly with parents on ethical matters. Such engagement promotes transparency, builds trust and supports higher consent return rates (see 'Method' for procedural detail).

Attitudes of stakeholders

One significant barrier to conducting research in schools is teachers' hesitancy to participate, often due to growing pressure to deliver intensive curricula and meet performance standards (National Institute of Health Research, 2021). In the UK, national exams occur at key developmental stages – Year 2 (optional), Year 6, Year 11 and Year 13 – which are critical for research but often inaccessible due to exam preparation. These pressures have worsened post-Covid, with learning loss equivalent to one-fifth of a school year, disproportionately affecting children from less-educated families (Engzell et al., 2021). Therefore, research may be viewed as a distraction or additional burden, particularly given teachers' increasing workloads and the negative impact on their wellbeing (Creagh et al., 2023), making extensive testing or observation appear impractical. Another barrier is the perceived lack of relevance; teachers often see research as misaligned with their priorities, describing it as abstract, unclear or overly complex (Mediha, 2006), with the challenges outweighing any perceived benefits (Midford et al., 2000).

These constraints highlight the value of alternative settings for data collection where participation is framed more positively. By recruiting and collecting data within public engagement sessions, the institutional pressures schools face is removed. Voluntary leaders at Scouting and Girlguiding communities often welcome research, viewing it as enriching and educational. Activities tied to badge progression or programme aims are especially well received, aligning with the ethos of these groups (Asensio-Ramón et al., 2021; Shapiro et al., 2015). Reframing research as added value rather than disruption encourages collaboration and supports more flexible, dialogic engagement.

Logistical barriers

Even with consent secured, logistical barriers often persist in school-based developmental research. School calendars, filled with exams, assemblies and extracurriculars, complicate planning and limit researcher flexibility (Alibali & Nathan, 2010; Midford et al., 2000). Access to certain groups may be restricted during the school week or term, and coordinating across institutions with differing schedules further disrupts timelines (Harackiewicz & Barron, 2004). While patience is essential, these demands can be difficult to reconcile with grant deadlines and publication cycles.

By contrast, our approach shifts research into afterschool clubs such as Scout and Girlguiding groups, which operate on regular weekly schedules, typically in early evenings. Free from national assessments and rigid term structures, these settings allow advanced planning without disrupting core activities. This consistency enables adaptable scheduling, repeated contact and multi-site delivery. Organised youth groups offer distinct logistical advantages, making them a more feasible context for developmental research (Mahoney et al., 2005).

Going beyond the classroom

Given increasing demands on schools, it is reasonable to question whether they remain the most effective environments for research. Conducting research through public engagement events held within afterschool clubs such as Scouting and Girlguiding groups offer a flexible, accessible alternative. These

groups provide structured activities in less constrained settings and do not interfere with academic instruction, meaning children are not disadvantaged by participation. They are also better equipped for innovation, making them well-suited for implementing and evaluating developmental psychology research in ways that are engaging, inclusive and contextually appropriate.

Benefits of public engagement and knowledge exchange

Public engagement events provide a compelling alternative to school-based research, offering not only logistical advantages but also broader social value. They support inclusive participation, promote diversity in research and encourage researchers to engage meaningfully with the wider community (Devonshire & Hathway, 2014). While still an emerging method, successful examples exist. McDonald et al. (2023), for instance, describe 'Summer Scientist Week' at the University of Nottingham, where research with children aged 4–11 is integrated into interactive science activities.

These events benefit participants as well. Children involved in public engagement report increased enthusiasm, curiosity and understanding of science (Blaxland et al., 2021; Idema & Patrick, 2019; Jensen & Buckley, 2014; Young et al., 2017). Indirect evidence also suggests long-term academic benefits, including enhanced retention (McLaughlin et al., 2018). Public engagement may also support long-term aspirations in underrepresented groups; McDonald et al. (2023) and Kiernan et al. (2023) highlight its role in encouraging young girls to pursue STEM education.

Institutions also benefit. Public engagement strengthens community trust, supports societal impact agendas and aids in recruiting students and staff (Beere et al., 2011; Devonshire & Hathway, 2014). It promotes a scientifically informed public and helps ensure that research remains grounded in real-world needs, all with minimal institutional risk.

An alternative approach to recruitment and data collection

Public engagement events in established community groups, such as Scouting and Girlguiding, is common within academia; however, we suggest integrating this with scientific research as an alternative method to recruitment and data collection in schools. These groups offer access to underutilised populations, enabling the recruitment of large, diverse samples. Beyond data collection, we advocate for integrating interactive, educational activities that inspire young people's interest in STEM (Abraham & Kerns, 2013; Asensio-Ramón et al., 2021; Shapiro et al., 2015). Such events benefit participants and enhance appeal for young people, caregivers and community leaders.

Scouting and Girlguiding groups typically meet weekly for 1–2 hours, catering to ages 4–18 across different sections (e.g. Beavers, Cubs etc.). With over 300,000 Girlguiding and 435,000 Scouting members in the UK, and a growing membership (Girlguiding, 2023; Scout Association, 2023), these organisations offer a compelling and sustainable alternative to school-based research.

Consent and recruitment

Ethical approval was sought for both public engagement activities and experimental research through one ethics application, granted by the University of Nottingham, School of Psychology Ethics Committee (Reference: F1563). Gatekeeper consent was obtained from Scouting and Guiding leaders. Prior to the event, a researcher visited each group to conduct a short talk to families explaining the nature of the session and when it would be held, allowing them to ask questions and opt out by choosing not to attend the night of science. Opt-in parental consent was then obtained for data collection via a Qualtrics form sent to parents. Finally, opt-out consent was used for public engagement activities. Young people for whom we did not have written parental consent could therefore still take part in the outreach programme, but their data was not collected. This approach respects autonomy and inclusivity, ensuring that participation in educational activities is not contingent on data contribution, while still upholding ethical standards of

informed consent and transparency. Importantly, using this method, parental consent was approximately 70 per cent for participation within the full session, which, in addition to giving consent for the young people to have their data recorded during the session, also included questions regarding demographic information such as age, sex, Index of Multiple Deprivation (obtained through postcodes), the AQ-child (Auyeung et al., 2008) and the SWAN (Swanson et al., 2012).

Recruitment for the sessions was completed largely through word of mouth and online advertising via social media platforms, with Scout and Girlguiding groups opting into the sessions, rather than being approached by researchers. This method has led to extremely positive leader engagement, both in communications prior to the sessions and in leaders' engagement during sessions.

Method

We propose an outreach programme, similar in structure to that proposed by McDonald et al. (2023), to facilitate data collection with such organisations. Throughout the course of their normal Scouting and Girlguiding evening, children rotate through multiple activity bases designed to be both engaging and educational. The programme aims to boost research participation while also offering a fun learning experience. Each activity base is designed to encourage engagement and interest in science and to align with badge requirements. These bases consist of 1) a gamified research study; 2) a scientific learning activity; and 3) a science-based conversation.

Young people rotate between these three bases during the session, lasting approximately 20 minutes, and catering to groups of approximately 30 young people (10 young people per base). The structure of these sessions can be adapted based on the age of the group, duration of sessions, the research being conducted and the expertise of the researchers. For example, in groups that meet for only one hour, it may be appropriate to have only two bases; and for groups with small numbers of participants, some components may be combined as a whole-group activity. In the instances where spare time is left, researchers can run a group game to mirror the normal structure of Scouting and Girlguiding evenings. This flexibility allows for delivery across a wide range of ages and group sizes. Furthermore, once the initial research project has been completed, the outreach programme activities and experiment can be adapted allowing researchers to return to groups on multiple occasions, without repetition of activities.

A gamified research study

This component of the programme allows for data collection. Within our view of outreach, this component exposes young people to psychological research methods and allows hands-on experience of how scientific experiments are conducted. The study used is designed to allow for group participation and, where possible, should be gamified to be engaging for young people. For example, a visual search task could be gamified through the introduction of cartoon characters needing assistance from the participant to reach a goal.

A scientific learning activity

Within this component, young people take part in a scientific learning activity. In the context of psychological research, this is designed to encourage children to question how their brain works, and to promote enjoyment in science. If possible, this could link to the research area of the gamified study. Continuing with the previous example, where the gamified research study investigates visual perception, then visual illusions could be used to explore the human visual system. For example, the Necker Cube Illusion could be presented, with children being asked to describe what they see. Following this, an explanation about ambiguity of the image can be provided. These descriptions should be adjusted in complexity according to the child's age.

A science-based conversation

The final base involves an open conversation where researchers disseminate ongoing research within their department at the university. This facilitates knowledge exchange, in an accessible way for young people, and allows them to explore topics such as neuroscience, or the 'day in the life of a scientist' with qualified academics. The complexity of such explanations can be tailored to the age of the children within the session, with the aim to encourage potential future careers in STEM subjects.

Participant demographics

To date, 568 young people from Scout and Girlguiding groups have participated in our research via the public engagement method. Convenience sampling was used to recruit participants, with group availability and distance from the academic institution acting as determining factors. Of our participants, 20 per cent were from the 50 per cent most deprived small areas in England as indicated by the Index of Multiple Deprivation. Additionally, gender was well represented in our research with 49.3 per cent of participants being male and 49.1 per cent female, with the remaining 1.6 per cent choosing not to supply this information.

While we acknowledge that members of Scouting and Girlguiding often come from less deprived backgrounds (47 per cent of our participants came from the 20 per cent least deprived areas in the country), recruitment through this method could be used to tackle specific areas of deprivation to develop a more representative sample when conducting research as Scouting and Girlguiding is increasingly opening sections in the most deprived areas of the UK ([Scout Association, 2019](#)). This approach may therefore capture young people typically underrepresented within research when required to attend research institutions for testing ([Emery et al., 2023](#)). As demonstrated by our current research whereby Scout and Girlguiding groups were equally visited, this method of recruitment can be used either to recruit an evenly balanced gender distribution or be used to target specific demographics of participants required for the research study.

Despite these benefits, some limitations remain. Scouting and Girlguiding communities may not yet fully reflect the ethnic and cultural diversity of the wider population. Scout Impact reports demonstrate that when considering ethnicity, members do not currently reflect the diversity within the general population ([Scout Association, 2023](#)), however, both organisations have committed to addressing this, with initiatives aimed at improving representation across ethnicity, gender identity and socioeconomic status. These include opening more groups in deprived areas, offering diversity and inclusivity training, and actively recruiting from underrepresented communities ([Scout Association, 2024](#)). In this context, these organisations show strong potential as evolving, inclusive environments for research, offering a promising and practical alternative to school-based data collection.

Benefits to leaders

This approach is designed to be mutually beneficial for both researchers and club leaders. For researchers it is low-cost, with expenses relating to travel and engagement materials. For Scouting and Girlguiding leaders, as unpaid volunteers responsible for planning and delivering structured sessions, many welcome the involvement of external organisations. Researchers relieve leaders of the need to prepare content for the session, while fulfilling supervision requirements simply by attending. Sessions often introduce content that leaders may lack the time, expertise or resources to deliver, making these collaborations particularly valuable.

Feedback from Scouting and Girlguiding leaders supports the longevity of this model. In post-session questionnaires, 95 per cent of leaders said they would welcome researchers back. One Brownie leader commented, 'the session meant the Brownies could access something we could not provide as leaders'. Aligning session content with badge requirements further adds value, allowing young people

to progress in an engaging, hands-on way. Leaders described the session as ‘a great way to educate the girls on how our brains work & also about possible careers in neuroscience’ (Brownie leader), and ‘fun, educational, and thought-provoking’ (Guide leader).

Practical implications and conclusion

This commentary highlights the practical benefits of diversifying recruitment through public engagement, particularly with Scouting and Girlguiding groups. These settings broaden access beyond schools and enhance participation by combining research with enjoyable, interactive activities. In doing so, they may foster greater interest in STEM and support stronger engagement than traditional methods. This approach also benefits researchers, gatekeepers, families and participants alike, supporting inclusive, collaborative and scalable data collection while also removing the burden often placed on schools to conduct research within.

Research in schools often involves complex logistics, including rigid schedules and layered permissions. In contrast, afterschool clubs offer more flexible timelines and simplified coordination. This approach is also cost-effective, requiring little investment beyond travel and basic materials, often obtainable through institutional lending, making it accessible for researchers with limited funding.

Declarations and conflicts of interest

Research ethics statement

The authors declare that research ethics approval for this article was provided by School of Psychology, University of Nottingham ethics board.

Consent for publication statement

The authors declare that research participants’ informed consent to publication of findings – including photos, videos and any personal or identifiable information – was secured prior to publication.

Conflicts of interest statement

The authors declare no conflict of interest with this work. All efforts to sufficiently anonymise the authors during peer review of this article have been made. The authors declare no further conflicts with this article.

References

- Abraham, M. M., & Kerns, K. A. (2013). Positive and negative emotions and coping as mediators of mother–child attachment and peer relationships. *Merrill-Palmer Quarterly*, 59(4), 399–425. <https://doi.org/10.13110/merrpalmquar1982.59.4.0399>
- Alibali, M. W., & Nathan, M. J. (2010). Conducting research in schools: A practical guide. *Journal of Cognition and Development*, 11(4), 397–407. <https://doi.org/10.1080/15248372.2010.516417>
- Asensio-Ramón, J., Rodríguez-Ferrer, J. M., Manzano-León, A., Aguilar-Parra, J. M., Díaz-López, M. d. P., & Torres-López, N. (2021). Does being a scout affect confinement due to COVID-19? A comparative exploratory descriptive study with Spanish adolescents. *Sustainability*, 13(18), 10409. <https://doi.org/10.3390/su131810409>
- Auyeung, B., Baron-Cohen, S., Wheelwright, S., & Allison, C. (2008). The autism spectrum quotient: Children’s version (AQ-Child). *Journal of Autism and Developmental Disorders*, 38(7), 1230–1240.
- Baines, E., Rubie-Davies, C. M., & Blatchford, P. (2009). Improving pupil group work interaction and dialogue in primary classrooms: Results from a year-long intervention study. *Cambridge Journal of Education*, 39(1), 95–117. <https://doi.org/10.1080/03057640802701960>
- Beere, C. A., Votruba, J. C., & Wells, G. W. (2011). *Becoming an engaged campus: A practical guide for institutionalizing public engagement*. John Wiley and Sons Inc.
- Blaxland, J., Thomas, R., & Baillie, L. (2021). Development of the school science club at Cardiff University. *Research for All*, 5(1), 86–100. <https://doi.org/10.14324/RFA.05.1.08>
- Boelens, M., Smit, M. S., Raat, H., Bramer, W. M., & Jansen, W. (2022). Impact of organized activities on mental health in children and adolescents: An umbrella review. *Preventive Medicine Reports*, 25, 101687. <https://doi.org/10.1016/j.pmedr.2021.101687>

- Bonnell, K. J., Hargiss, C. L., & Norland, J. E. (2018). Challenges conducting research with adolescents in public schools. *Natural Sciences Education*, 47(1), 1–7. <https://doi.org/10.4195/nse2018.01.0002>
- Brevik, L. M. (2013). Research ethics: An investigation into why school leaders agree or refuse to participate in educational research. *Problems of Education in the 21st Century*, 52(1), 7–20.
- Campbell, A. (2008). For their own good: Recruiting children for research. *Childhood*, 15(1), 30–49. <https://doi.org/10.1177/0907568207086834>
- Chişiu, C. M. (2013). Extracurricular activities, an alternative for interdisciplinary learning. *Postmodern Openings*, 4(4), 67–79. <https://doi.org/10.18662/po/2013.0404.07>
- Creagh, S., Thompson, G., Mockler, N., Stacey, M., & Hogan, A. (2023). Workload, work intensification and time poverty for teachers and school leaders: A systematic research synthesis. *Educational Review*, 77(2), 1–20. <https://doi.org/10.1080/00131911.2023.2196607>
- Department for Culture, Media & Sport. (2024, November 7). *Official statistics youth participation pilot survey: Executive summary*. www.gov.uk/government/statistics/youth-participation-pilot-survey-findings/youth-participation-pilot-survey-executive-summary
- Devonshire, I. M., & Hathway, G. J. (2014). Overcoming the barriers to greater public engagement. *PLoS Biology*, 12(1), e1001761. <https://doi.org/10.1371/journal.pbio.1001761>
- Edwards, K. M., Orchowski, L. M., Espelage, D. L., & Temple, J. R. (2023). What is not in the methods section: Challenges, successes, and lessons learned from conducting school-based interpersonal violence prevention research. *Journal of Interpersonal Violence*, 38(3–4), 4507–4532. <https://doi.org/10.1177/08862605221109881>
- Emery, L. F., Silverman, D. M., & Carey, R. M. (2023). Conducting research with people in lower-socioeconomic-status contexts. *Advances in Methods and Practices in Psychological Science*, 6(4), 1–13. <https://doi.org/10.1177/25152459231193044>
- Engzell, P., Frey, A., & Verhagen, M. D. (2021). Learning loss due to school closures during the COVID-19 pandemic. *Proceedings of the National Academy of Sciences of the United States of America*, 118(17), e2022376118. <https://doi.org/10.1073/pnas.2022376118>
- Gaias, L. M., Duong, M. T., Pullmann, M. D., Brewer, S. K., Smilansky, M., Halbert, M., Carey, C. M., & Jones, J. (2020). Race and ethnicity in educational intervention research: A systematic review and recommendations for sampling, reporting, and analysis. *Educational Research Review*, 31, 100356. <https://doi.org/10.1016/j.edurev.2020.100356>
- Girlguiding. (2023). *Girlguiding impact report 2023: Understanding our impact*. <https://girlguiding.foleon.com/girlguiding-impact-report/girlguidingimpactreport/>
- Gul, R. B., & Ali, P. A. (2010). Clinical trials: The challenge of recruitment and retention of participants. *Journal of Clinical Nursing*, 19(1–2), 227–233. <https://doi.org/10.1111/j.1365-2702.2009.03041.x>
- Harackiewicz, J. M., & Barron, K. E. (2004). Conducting social psychological research in educational settings: “Lessons we learned in school”. In C. Sansone, C. C. Morf, & A. T. Panter (Eds.), *The Sage handbook of methods in social psychology* (pp. 471–484). Sage Publications, Inc.
- Hoenig, J. M., & Heisey, D. M. (2001). The abuse of power: The pervasive fallacy of power calculations for data analysis. *The American Statistician*, 55(1), 19–24. <https://doi.org/10.1198/000313001300339897>
- Idema, J., & Patrick, P. G. (2019). Experiential learning theory: Identifying the impact of an Ocean Science Festival on family members and defining characteristics of successful activities. *International Journal of Science Education*, 9(3), 214–232. <https://doi.org/10.1080/21548455.2019.1614238>
- Ievers-Landis, C. E., Burant, C., Drotar, D., Morgan, L., Trapl, E. S., Colabianchi, N., & Kwok, C. K. (2005). A randomized controlled trial for the primary prevention of osteoporosis among preadolescent Girl Scouts: 1-year outcomes of a behavioral program. *Journal of Pediatric Psychology*, 30(2), 155–165. <https://doi.org/10.1093/jpepsy/jsi003>
- Jensen, E., & Buckley, N. (2014). Why people attend science festivals: Interests, motivations and self-reported benefits of public engagement with research. *Public Understanding of Science*, 23(5), 557–573. <https://doi.org/10.1177/0963662512458624>
- Kiernan, L., Walsh, M., & White, E. (2023). Gender in technology, engineering and design: Factors which influence low STEM subject uptake among females at third level. *International Journal of Technology and Design Education*, 33(2), 497–520. <https://doi.org/10.1007/s10798-022-09738-1>
- Lamb, J., Puskar, K. R., & Tusaie-Mumford, K. (2001). Adolescent research recruitment issues and strategies: Application in a rural school setting. *Journal of Pediatric Nursing*, 16(1), 43–52. <https://doi.org/10.1053/jpdn.2001.20552>
- Lonergan, R., & Cumming, T. M. (2017). Riding the rapids of classroom-based research. *The Australian Educational Researcher*, 44(2), 141–160. <https://doi.org/10.1007/s13384-016-0223-6>
- Lovato, L. C., Hill, K., Hertert, S., Hunninghake, D. B., & Probstfield, J. L. (1997). Recruitment for controlled clinical trials: Literature summary and annotated bibliography. *Controlled Clinical Trials*, 18(4), 328–352. [https://doi.org/10.1016/s0197-2456\(96\)00236-x](https://doi.org/10.1016/s0197-2456(96)00236-x)
- Magaji, A., Ade-Ojo, G., & Bijlhout, D. (2022). The impact of after school science club on the learning progress and attainment of students. *International Journal of Instruction*, 15(3), 171–190. <https://doi.org/10.29333/iji.2022.15310a>

- Mahoney, J. L., Larson, R. W., & Eccles, J. S. (2005). *Organized activities as contexts of development: Extracurricular activities, after-school and community programs*. Lawrence Erlbaum Associates Publishers.
- McDonald, S., Beer, S., Cragg, L. (2023). The impact of out-of-school science activities for primary school children on science knowledge, interest and later academic choices: An evaluation study. *Research for All*, 7(1), 20. <https://doi.org/10.14324/RFA.07.1.20>
- McLaughlin, J. A., Boothroyd, L. G., & Philipson, P. M. (2018). Impact arising from sustained public engagement: A measured increase in learning outcomes. *Research for All*, 2(2), 244–256. <https://doi.org/10.18546/RFA.02.2.04>
- Mediha, S. A. R. I. (2006). Teacher as a researcher: Evaluation of teachers' perceptions on scientific research. *Educational Sciences: Theory & Practice*, 6(3), 880–887.
- Midford, R., McBride N., & Farrington, F. (2000). Conducting research in schools: Lessons learnt from experience. *Health Promotion Journal of Australia*, 10(1), 63–68.
- Milnes, L., & Kendal, S. (2012). Ethical challenges of conducting health research in UK school setting. *British Journal of Nursing*, 21(5), 294–298. <https://doi.org/10.12968/bjon.2012.21.5.294>
- National Institute of Health Research. (2021, August 6). *Recruitment challenges of school-based research in the wake of Covid-19*. <https://sphr.nihr.ac.uk/news-and-events/recruitment-challenges-of-school-based-research/>
- Oates, C., & Riaz, N. N. (2016). Accessing the field: Methodological difficulties of research in schools. *Education in the North*, 23(2), 53–74. <https://doi.org/10.26203/81j5-ac70>
- Pincus, D. B., & Friedman, A. G. (2004). Improving children's coping with everyday stress: Transporting treatment interventions to the school setting. *Clinical Child and Family Psychology Review*, 7(4), 223–240. <https://doi.org/10.1007/s10567-004-6087-8>
- Prescott, R. J., Counsell, C. E., Gillespie, W. J., Grant, A. M., Russell, I. T., Kiauka, S., Colthart, I. R., Ross, S., Shepherd, S. M., & Russell, D. (1999). Factors that limit the quality, number and progress of randomised controlled trials. *Health Technology Assessment (Winchester, England)*, 3(20), 1–143.
- Rice, M., Bunker, K. D., Kang, D. H., Howell, C. C., & Weaver, M. (2007). Accessing and recruiting children for research in schools. *Western Journal of Nursing Research*, 29(4), 501–514. <https://doi.org/10.1177/0193945906296549>
- Scout Association. (2019). *Over 20,000 young people in areas of deprivation join Scouts*. <https://www.scouts.org.uk/news/2019/may/over-20-000-young-people-in-areas-of-deprivation-join-scouts/>
- Scout Association. (2023). *Annual report and accounts 2022–2023*. <https://www.scouts.org.uk/about-us/our-impacts-and-reports/scouts-annual-report-2022-23/>
- Scout Association. (2024). *Race Equity*. <https://www.scouts.org.uk/about-us/strategy/our-programmes-of-work/race-equity/>
- Shapiro, M., Grossman, D., Carter, S., Martin, K., Deyton, P., & Hammer, D. (2015). Middle school girls and the 'Leaky Pipeline' to leadership. *Middle School Journal*, 46(5), 3–13. <https://doi.org/10.1080/00940771.2015.11461919>
- Sugden, N. A., & Moulson, M. C. (2015). Recruitment strategies should not be randomly selected: Empirically improving recruitment success and diversity in developmental psychology research. *Frontiers in Psychology*, 29(6), 523. <https://doi.org/10.3389/fpsyg.2015.00523>
- Sugden, N. A., Kusec, A., & Moulson, M. C. (2013). *Stepping out with my baby: Does involvement in extracurricular activities predict parents' willingness to participate in developmental research?* [Conference presentation]. Canadian Psychological Association 74th Annual Convention, Quebec City, QC.
- Swanson, J. M., Schuck, S., Porter, M. M., Carlson, C., Hartman, C. A., Sergeant, J. A., Clevenger, W., Wasdell, M., McCleary, R., Lakes, K., & Wigal, T. (2012). Categorical and dimensional definitions and evaluations of symptoms of ADHD: History of the SNAP and the SWAN rating scales. *The International Journal of Educational and Psychological Assessment*, 10(1), 51–70.
- Testa, A. C., & Coleman, L. M. (2006). Accessing research participants in schools: A case study of a UK adolescent sexual health survey. *Health Education Research*, 21(4), 518–526. <https://doi.org/10.1093/her/cyh078>
- Torgerson, J. S., Arlinger, K., Käppi, M., & Sjöström, L. (2001). Principles for enhanced recruitment of subjects in a large clinical trial: The XENDOS study experience. *Controlled Clinical Trials*, 22(5), 515–525. [https://doi.org/10.1016/s0197-2456\(01\)00165-9](https://doi.org/10.1016/s0197-2456(01)00165-9)
- Watson, J. M., & Torgerson, D. J. (2006). Increasing recruitment to randomised trials: A review of randomised controlled trials. *BMC Medical Research Methodology*, 6, 34. <https://doi.org/10.1186/1471-2288-6-34>
- Young, J., Ortiz, N., & Young, J. (2017). STEMulating interest: A meta-analysis of the effects of out-of-school time on student STEM interest. *International Journal of Education in Mathematics, Science and Technology*, 5(1), 62–74. <https://ijemst.com/index.php/ijemst/article/view/373>