



UNIVERSITY OF
BIRMINGHAM

Real world problem solving: advancing cognitive developmental science and supporting informal education.

University of Birmingham and Thinktank, Birmingham Science Museum

We often encounter problems that we need to solve, for example, how to obtain an out-of-reach object. Problem solving has been researched by cognitive scientists, biologists, and comparative psychologists. Developmental psychologists have generally focussed on individual children solving problem that are given to them by adults. Yet real world problem solving is much richer than this. This project will explore neglected aspects of problem solving (specifically problem spotting, collaboration, and communication), and take our research from the laboratory to the real world. Our aims are to advance our theoretical understanding of children's problem solving and apply this knowledge in an informal educational setting.

The project is a collaboration with Thinktank Science Museum in Birmingham. Thinktank Museum has an extensive educational programme and is currently developing its resources for under 8-year-olds focusing on children's scientific problem solving in the context of creating a city and children's everyday lives. The PhD student will develop new activities and evaluate their success. The PhD student will also complete two 1-month placements to further their understanding of informal education.

Key research questions:

- How does children's ability to spot problems develop? Are children influenced by problem-solving with others? How do children communicate their solutions?
- How can evidence be applied to support development of informal education activities?

Methods and techniques

Three phases of research each address a neglected aspect of children's problem solving: problem spotting, collaboration, communication. Each phase will include a theoretical and an applied study. The PhD student will be involved in designing problem-solving tasks (e.g. Beck et al., 2011; Tennie et al., 2009), experimental data collection, observations of children's behaviour in the museum, data analysis, and writing up and presenting results.

The student will gain high levels of training in scientific methods and informal education. They will benefit from supervision at the University by Dr Sarah Beck, Prof Ian Apperly and their research groups, and at Thinktank, from John Arcus, Exhibitions Project Manager, and the Community Engagement Team. The student will develop public engagement skills in events at Thinktank and beyond. After the PhD the student will be well placed to pursue a postdoctoral post in theoretical or applied research, or apply their skills in educational settings.

Related Reading

- Beck, S.R., Apperly, I.A., Chappell, J., Guthrie, C., & Cutting, N. (2011). Making tools isn't child's play. *Cognition*, 119, 301-306.
- Callanan, M.A. (2012). Conducting cognitive developmental research in museums: theoretical issues and practical considerations, *Journal of Cognition and Development*, 13, 137-151
- Tennie, C., Call, J., & Tomasello, M. (2009). Ratcheting up the ratchet: on the evolution of cumulative culture. *Philosophical Transactions of the Royal Society of London B Biological Sciences*, 364, 2405-2415.

The successful applicant will need:

- A good (2i or higher) first degree in Psychology or a related subject.
- A strong interest in cognitive development and cognitive science.
- Experience working, and ideally conducting research, with young children.
- Excellent communication skills for working with children, their families, and the museum team.
- Excellent research methods skills.

To apply for this studentship please complete the application form [available here](#) and send it with your CV, two references, transcripts of your previous qualifications, and a cover letter, describing one or more research projects you have been involved in (no more than 1000 words) to Parveen Chahal p.k.chahal@bham.ac.uk.

Questions about the PhD project can be directed to the lead supervisor, Sarah Beck s.r.beck@bham.ac.uk.

Closing Date for applications 17th February 2017

Interviews will be held on 2nd March 2017