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Research Grants
PROPOSAL

Document Status: With Owner
ESRC Reference:

Standard Grants (Open Call)
Psychology Arts and Humanities*

Organisation where the Grant would be held

Organisation	University of Warwick	Research Organisation Reference:	jelly
Division or Department	Psychology		

Project Title [up to 150 chars]

Extracting Knowledge from Other Minds: What do Children Understand about Question-asking?

Start Date and Duration

a. Proposed start date	01 September 2008	b. Duration of the grant (months)	24

Applicants

Role	Name	Organisation	Division or Department	How many hours a week will the investigator work on the project?
Principal Investigator	Professor Elizabeth Robinson	University of Warwick	Psychology	3
Co-Investigator	Dr Stephen Butterfill	University of Warwick	Department of Philosophy	2.7

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Objectives

List the main objectives of the proposed research [up to 4000 chars]

The aims of the proposed research are:
1. To conduct five experiments to examine 3- 4 and 5- year olds' question-asking in order to pinpoint when they do and do not take into account a potential informant's knowledge
2. To interpret the results in terms of developing understanding about transfer of knowledge between minds, and
3. To develop a broader account of the development of children's understanding of what knowledge is, drawing on literatures in psychology and philosophy.

Summary

Describe the proposed research in simple terms in a way that could be publicised to a general audience [up to 4000 chars]

Why do children ask questions? The answer seems obvious. As adults, we assume that we can draw on other people's knowledge and experience of the world by asking them. We understand that knowledge can be transferred between people, and that we do not need to wait for somebody to offer information to us, but that we can be proactive in filling gaps in our own knowledge by asking a more knowledgeable other. Children are especially dependent on others for gaining knowledge, and so it is of particular interest to find out what they understand about the process of extracting knowledge from other people by asking questions. In the proposed research we shall investigate this.

Of course even 2-year-olds ask questions and do gain knowledge as a result, but their question-asking is not necessarily based on an understanding of what they are doing. Rather, young children may ask questions simply when they are uncertain and the social context invites question-asking. In our recent work, children aged between 3 and 5 years played a game in which they tried to identify a hidden toy. They were just as likely to ask an adult Experimenter for help whether or not she had seen the toy. That is, they asked questions to fill a gap in their own knowledge without taking into account the Experimenter's knowledge.

This behaviour becomes especially interesting when we consider other ways in which children this age appear to take into account an adult's knowledge. First, when an adult spontaneously tells the child which toy she thinks is hidden, without waiting to be asked, children correctly disbelieve her when she has not seen the hidden toy, and believe her when she has seen it. Yet when they receive the same information as a result of having asked a question, they believe the answer whether the adult is informed or uninformed. Second, when an adult marks a picture to show which toy she thinks is hidden, instead of giving an oral suggestion, children are influenced by the adult's knowledge when deciding whether proactively to consult her marked picture. Yet this behaviour is equivalent to asking a question, in that the child is proactive in gaining information from the adult. On the other hand, this behaviour is importantly different from question-asking in that the adult's knowledge is represented externally (in the form of a marked picture), whereas at the time the child decides to ask a question there is no external indication of the adult's knowledge. This may give us a clue to where children's difficulty lies with question-asking.

In the proposed research we shall carry out five experiments building on these results, to identify when 3-, 4- and 5-year old children do and do not take into account a potential informant's knowledge when they ask questions. Sometimes the potential informant's ignorance will be obvious because she has not seen the hidden toy, as above. Another cue to ignorance that children take into account when adults offer information spontaneously, is the adult's history of being inaccurate. We shall investigate whether children take into account history of inaccuracy when deciding whether to ask questions. We shall also vary the kind of knowledge the child aims to gain: knowledge about a current event or situation (such as the identity of a hidden toy), or more lasting knowledge about the name or function of a novel object. Children may be especially careful about the likely reliability of this latter kind of knowledge, and so may be better at taking into account the knowledge state of their potential informant when they decide to ask questions.

We shall use our results, as well as relevant existing literatures in developmental psychology and philosophy, to develop an account of what it means to understand what knowledge is, and how someone could be motivated to ask relevant questions without understanding knowledge.

Beneficiaries

Describe who will benefit from the research [up to 4000 chars].

The main beneficiaries will be academics: psychologists with an interest in young children's social and cognitive development, and philosophers of mind. We list philosophers as beneficiaries for several reasons. First a philosophical question is central to our work (What is involved in understanding knowledge, and what stages or forms of understanding must be distinguished?). Second there has been extensive debate in philosophy on theory of mind generally. We aim to contribute to this debate by focussing on knowledge rather than belief and by examining children's strategies for acquiring knowledge whereas other research emphasises how children use their knowledge. Third there is an longstanding debate concerning the nature of inquiry (e.g. Dewey 1938; Stich 1990; Hookway 2000; Butterfill 2003 [D.Phil thesis]) which is guided almost entirely by reflection on adult competence; it is possible that facts about the strategies, heuristics and

insights of children as novice inquirers should also inform this debate.

Staff Duties

Summarise the roles and responsibilities of each post for which funding is sought [up to 2000 characters]

Robinson (developmental psychology) will take responsibility for the overall management of the project, and for ensuring that it runs to time. She will be involved in all aspects of the research.
Butterfill (philosophy) will be most heavily involved with the theoretical development in the later stages of the project although he will keep in touch with the conduct and results of the experiments and will observe some of the testing. Butterfill has previously collaborated successfully with developmental psychologists, on an AHRC funded project on causal understanding. His background in philosophy of mind as well as his familiarity with the developmental literature make him extremely well qualified for this research.
The psychology researcher appointed will be responsible for maintaining good contacts with schools and nurseries, for creating the experimental materials, collecting and analysing the data and providing feedback to schools. We hope to appoint a psychologist with an interest, and ideally expertise, in philosophy, who will be able to contribute to the theoretical development. Writing for publication and conference presentations will be shared collaboratively between the researcher and the co-applicants.

Communications Plan and User Engagement

Describe plans to engage with potential users of the research, to communicate the results of the research to such users, and the potential value of the research to users outside the research community [up to 4000 chars]

This is fundamental research and non-academic users will not be involved in the design or running of the research, although we always welcome comments from teachers who see our tasks when we take them into nurseries and schools. We provide accessible reports of our findings to the nurseries and schools involved, in the form of a regular newsletter. Depending on how our results turn out, it might be appropriate to communicate them to the media. Our main outputs however will be in academic journals such as Child Development, Developmental Science, Mind and Language, and Mind. Some of our outputs will be aimed at philosophers with no prior knowledge of the empirical research. We shall present our findings at national and international conferences including the European Society of Philosophy and Psychology that meets annually, and the biennial meetings of the Society for Research in Child Development and the Cognitive Development Society, both of which will meet in 2009.

Ethical Information

Has consideration been given to any ethical matters raised by this proposal ?	Yes

Please explain what, if any, ethical issues you believe are relevant to the proposed research project, and which ethical approvals have been obtained, or will be sought if the project is funded? If you believe that an ethics review is not necessary, please explain your view (available: 4000 characters)

The research involves young children as participants. The research will be conducted within the ethical guidelines of the British Psychological Society. Should funding be approved, an application will be made to Warwick University's Humanities and Social Sciences Research ethics Committee. Head teachers and class teachers will be fully informed about the tasks and will observe them in action if they wish. Parental consent will be sought if that is the head teacher's wish. Children only take part if they volunteer and it is a priority that the tasks are fun for the child participants. If the Experimenter judges that any child is unhappy during testing, testing will cease. No personal data will be gathered from children other than gender and birth date. No individual will be identifiiable in any report of the research. The researcher will submit to an enhanced Criminal Records Bureau check.

Summary of Resources Required for Project

Financial resources

Summary fund heading	Fund heading	Full economic Cost	ESRC contribution	% ESRC contribution
Directly Incurred	Staff	64675.00	51740.00	80
	Travel & Subsistence	12150.00	9720.00	80
	Equipment	0.00	0.00	80
	Other Costs	3200.00	2560.00	80
	Sub-total	**80025.00**	**64020.00**	
Directly Allocated	Investigators	20869.08	16695.26	80
	Staff	0.00	0.00	80
	Estates Costs	19784.00	15827.20	80
	Other Directly Allocated	0.00	0.00	80
	Sub-total	**40653.08**	**32522.46**	
Indirect Costs	Indirect Costs	69548.00	55638.40	80
Exceptions	Staff	0.00	0.00	100
	Other Costs	0.00	0.00	100
	Sub-total	**0.00**	**0.00**	
	Total	**190226.08**	**152180.86**	

Summary of staff effort requested

	Months
Investigator	3.75
Researcher	24
Technician	0
Other	0
Visiting Researcher	0
Student	0
Total	27.75

Related Proposals

Proposal is related to a previous proposal to ESRC

Reference Number	How related?	Reason for submitting
RES-000-22-2264	Resubmission	Major reworking. New results support our previous hypotheses. New questions arise from these.

Previous Proposals

Enter the ESRC reference numbers of any support sought or received from ESRC in the past five years.	RES-000-22-0825 RES-000-22-0305 RES-000-22-0277 RES-000-22-1847 RES-062-23-0335 RES-000-23-7932 RES-000-23-0881

Staff

Directly Incurred Posts

						EFFORT ON PROJECT					
Role	**Name /Post Identifier**	**Basic Starting Salary**	**Scale**	**Increment Date**	**Start Date**	**Period on Project (months)**	**% of Full Time**	**London Allowance (£)**	**Super-annuation and NI (£)**	**Total Other Allowances (over period of appointment) (£)**	**Total cost on grant (£)**
Researcher	Researcher	25888	FA6 SP27	01/09/2009	01/09/2008	24	100	0	5478	0	64675
										Total	64675

Applicants

Role	Name	Post will outlast project (Y/N)	Contracted working week as a % of full time work	Total number of hours to be **charged** to the grant over the duration of the grant	Average number of hours per week **charged** to the grant	Rate of Salary pool/banding	Cost estimate
Principal Investigator	Professor Elizabeth Robinson	Y	100	264	3	90555	14489
Co-Investigator	Dr Stephen Butterfill	Y	100	238	2.7	44233	6380
						Total	20869

Travel and Subsistence

Destination and purpose		Total £
Within UK	Travel to schools for data collection 100 days @ £8 per day	800
Outside UK	Accommodation, registration, travel and subsistence for RF and 1 coapplicant to SRCD meeting, USA location unknown; Cognitive Development Society San Antonio, 2009; European Society for Philosophy and Psychology 2009 and 2010; European location unknown	7200
Within UK	Travel, subsistence and accommodation for RF and 1 coapplicant at British Psychogical Society Developmental Section meeting 2009, location unknown	600
Outside UK	Collaboration with Dr Stanka Fitneva - I person to the UK from Canada for 1 week; 1 person from the UK to Canada for 1 week	3150
Within UK	Travel by train Bristol to Coventry for Dr Erika Nurmsoo, 8 return journeys	400
	Total £	12150

Other Directly Incurred Costs

Description	Total £
PC + Printer for RF, standard Warwick specification	1300
Small consumables: toys for experiments, batteries, printer cartridges	300
Book tokens for schools at £20 per class of 25 children, in recognition of their help	600
Advertising for RF + travel expenses for 4 interviewees	1000
Total £	3200

Timetable estimates of the number of months after the start of the project to reach the following stages:

Stage	Number of Months
Completion of all preparation and design work	14
Commencement of fieldwork or material/information/data collection phase of study	1
Completion of fieldwork or collection phase of study	18
Commencement of analysis phase of study (substantive phase where research facilities are involved)	3
Completion of analysis phase of study	20
Commencement of writing-up of the research	4
Completion of preparation of any new datasets for archiving	23
Completion of writing-up	27

Data Collection

If the research involves data collection or acquisition, please indicate how existing datasets have been reviewed and state why currently available datasets are inadequate for the proposed research.	The relevant literature has been reviewed and no data are currently availalbe to answer the specific questions posed in the proposal.
Will the research proposed in this application produce new datasets?	Yes
Will this data be:	☒ Quantitative ☐ Qualitative
Please give a brief description of the datasets	5 experiments, N = 120,240, 180, 120, 120 approx.
It is a requirement to offer data for archiving, if you envisage any difficulties in making data available for secondary	No difficulties expected

research, please outline here:	
Who are likely to be the users (academic or non-academic) of the dataset(s)?	The raw data are unlikely to be useful to others since the experiments are designed to answer narrowly specified questions.
Please outline the plans for and cost of preparing and documenting the data for archiving to the standards required by the ESDS.	No additional costs.

OTHER INFORMATION

Academic Reviewers

1	Name	Address	Town	Email Address
Dr Vikram Jaswal		Dept of Psychology	Charlottesville	jaswal@virginia.edu

Academic Reviewers

2	Name	Address	Town	Email Address
Professor Josef Perner		Dept of Psychology	Salzburg	josef.perner@sbg.ac.at

Classification

International in nature? Yes

Please give details

The ESRC funded work will be located entirely in UK. However we ask for funds to collaborate with Dr Stanka Fitneva, Queens University, Ontario, Canada. She has been working on closely related research that also takes an interesting cross-cultural and cross-linguistic perspective. She has been in research contact with Robinson for some years. We ask for funds for the RF to make one week's research visit from Warwick to Queens, and for Dr Fitneva to make one week's return visit to Warwick. Immediately porior to the start of this proposed project, Robinson will be visiting Queens to take part in a workshop on testimony organised by Dr Fitneva. In addition, we shall meet at conferences. This collaboration will allow us to exchange ideas and results and develop future joint work.

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JUSTIFICATION OF RESOURCES

Directly allocated:

Investigator time: Robinson's average commitment of 3 hours per week will allow her to keep in close touch with all aspects of the research and ensure that the project runs efficiently and effectively, and complete the final report. There will be no interference with another ongoing ESRC project RES-062-23-0335, January 2007-February 2010, which takes on average 5 hours per week. Robinson has no other funded research and no other applications planned. Butterfill's commitment, on average 2.7 hours per week, will in practice be used less early on in the project and more towards the end, after the empirical work is completed. This will give him sufficient time to develop the theoretical side of the research, whilst keeping fully in touch with the progress of the experiments and with other relevant literature.

Directly incurred costs:

Staff: We ask for a psychology postdoctoral research fellow, ideally with expertise in relevant philosophy, who will collect and analyse the data and contribute to theory development..

Travel and subsistence: We estimate that the RF will need to visit schools on 100 days, assuming we test approx 8 children per day, with a total of 120, 240, 180, 120, and 120 children in Experiments 1,2,3,4 and 5 respectively. We assume the standard Warwick mileage rate of 40p per mile and visiting schools at an average distance of 10 miles from the university.

We ask for funds for two people, the RF and one of the investigators, to attend the following conferences, costing for which is based on previous attendances:
European Society for Philosophy and Psychology, Europe, summer 2009 and 2010;
Biennial meetings of Society for Research in Child Development, USA, spring 2009;
Biennial meetings of Cognitive Development Society, San Antonio, USA, Autumn 2009;
Meetings of Developmental Section of British Psychological Society, UK, Autumn 2009.

The research fellow will be given the opportunity to attend and present, to help his/her career development. We expect to gain funding from other sources to allow the third member of the team to attend also.

We also ask for travel costs for Dr Erika Nurmsoo to travel from Bristol to Warwick 4 times per year over the 2 years of the project, at £50 per return train journey. Dr Nurmsoo conducted the experiment involving the picture procedure as well as the pilot work for proposed Experiment 3A. She will be employed full time as an RF on another project at Bristol University, but we would like her to keep in touch with the project and if possible contribute to publications arising from it.

Finally, we ask for travel and subsistence costs to allow collaboration with Dr Stanka Fitneva, Queens University Canada. Robinson has been in research contact with Dr Fitneva for several years, and Dr Fitneva's ongoing research on children's question-asking is the only other research we know of that connects closely with ours. We ask for costs for a one-week visit to Queens by the RF, and a one week-visit to Warwick by Dr Fitneva, and in addition we shall meet at one or more of the conferences listed above.

Other: The research fellow needs a standard office PC and a laser printer for writing and data analysis, and we ask for the standard Warwick office model for each. Replacement printer cartridges will be needed, again at standard university cost. For the experiments we need toys, and attractive stickers for prizes. A suitable digital voice recorder is already available and is not costed into this project. We ask for funds for book tokens for schools in acknowledgement of their help (£20 per class of approx 25 children). These are appreciated and make us more welcome when we ask to visit again.

Finally, we ask for costs for advertising the RF post (£800) and recruiting, with estimated travel costs for 4 interviewees at £50 each.

BRIEF CURRICULUM VITAE: Elizabeth J. Robinson

Qualifications:
BSc first class, psychology, University of London (University College), 1968;
PhD psychology, University of London (University College), 1972

Current position:
Professor of Psychology, Warwick University
Honorary Professor of Developmental Psychology, University of Birmingham

Previous positions:
Professor of Psychology, Keele University (1999-2005);
Professor, senior lecturer, lecturer at University of Birmingham School of Psychology (1987-1999);
Part-time senior research fellow, research fellow at University of Bristol School of Education (77-87);
Part-time research fellow at Macquarie University, Sydney (73-77);
Lecturer in psychology at Southampton University (71-73).

Past Research Grants:
ESRC. Children's understanding of their knowledge or ignorance of utterance meanings, 1985-1990, £67,000 (EJR.);
SWRHA Patients' comprehension of doctor's instructions, 1984-1987, (E.J.R. & M.J. Whitfield), £6,000;
ESRC, Patients' comprehension of doctor's instructions 1985-1988, (E.J.R.) £11,000;.
WMRHA, 1988-1990, (E.J.R. & M. Drury) £25,000;
ESRC Development of writing skills in doctoral research students, 1989-1991 (G.V. Thomas & E.J.R.), £34,000;
ESRC Children's understanding of direct and indirect sources of knowledge, (18 mths) 1992-1993 (EJR. & P. Mitchell), £35,000;
ESRC. The development of children's understanding about pictures, (2 yrs) 1992-1994 (G.V. Thomas & EJR), £46,000;
Leverhulme Trust. Development of writing skills in undergraduate students, 1993-1996 (G.V. Thomas & E.J.R.), £77,000;
ESRC Counterfactual reasoning in young children: when do realist errors occur. (2 yrs) Oct 95 - Dec 97 (EJR, D.M Peterson et al.) £60,956;
ESRC Assessing understanding of referential opacity, (1 yr) Jan 96- Dec 96 (P. Mitchell & EJR) £29,360;
ESRC Do children confuse information learnt from real life and from television? (18 mths) April 98- Sept 99 (M. Blades & EJR) £34,076;
ESRC Handling of partial representation by children and adults. (2 yrs) April 99 - March 01 (EJR, I. Apperly & J. Barnden).£65,367;
NHS HTA Lay people's understanding of randomisation and equipoise in clinical trials, Dec 00-Dec 03, £140,000;
ESRC Development of children's thinking about possibilities, Sept 03-Aug 04, £40,000 (S.R.Beck, E.J.R, I Apperly);
ESRC Young children's metalinguistic awareness of oral and written language, £40,000 (I Apperly, EJR);
ESRC Do young children know how they know? Oct 04 – Sept 05 £45,000 (EJR);
ESRC Learning from others: Identifying unreliable individuals vs unreliable assertions Sept 06- 07, approx £75,000 (EJR);

Current Research Grant:
ESRC Children's handling of uncertainty: The influence of an unknown reality. Jan 07- Feb 10, approx £250,000 (EJR, S. Beck, M. Rowley).

Relevant Recent Publications (omitting papers on understanding of randomised controlled trials):

Robinson, E.J. & Apperly, I.A. (2001) Children's difficulties with partial representations in ambiguous messages and referentially opaque contexts. *Cognitive Development, 16,* 595-615.

Apperly, I.A. & Robinson, E.J. (2002) Five year olds' handling of reference and description in the domains of language and mental representation. *Journal of Experimental Child Psychology, 83,* 53-75.

Robinson, E.J. & Whitcombe, E. (2003) Children's suggestibility in relation to their understanding about sources of knowledge. *Child Development, 74,* 48-62.

Robinson, E.J. (2003) Six year olds' contradictory judgments about knowledge and beliefs. *Trends in Cognitive Science, 7,* 235-237.

Apperly, I.A. & Robinson, E.J. (2003) When can children handle referential opacity? Evidence for systematic variation in 5- and 6- year old children's reasoning abut beliefs and belief reports. *Journal of Experimental Child Psychology, 85,* 297-311.

Collins, J.S. & Robinson, E.J. (2005) Can one written word mean many things? Prereaders' assumptions about the stability of written words' meanings. *Journal of Experimental Child Psychology, 90,* 1-20.

Beck, S.R., Robinson, E.J., Carroll, D.J. & Apperly, I.A. (2006). Children's thinking about counterfactuals and future hypotheticals as possibilities. *Child Development. 77,* 413-426.

Robinson, E.J., Rowley, M.G., Beck, S.R., Carroll, D.J., & Apperly, A.I. (2006) Children's sensitivity to their own relative ignorance: Handling of possibilities under epistemic and physical uncertainty. *Child Development*. *77,* 1642-1655

Banerjee,R., Yuill, N., Larson, C., Easton, K., Robinson, E.J. & Rowley, M.G. (2007) Children's differentiation between beliefs about matters of fact and matters of opinion. *Developmental Psychology*. 43, 1084-1096

Rowley, M.G. & Robinson, E.J. (2007). Understanding the truth about subjectivity. *Social Development,*16.

Haigh, S. N. & Robinson, E.J. (in press, Jan 2007). What children know about the source of their knowledge without reporting it *as* the source. *European Journal of Developmental Psychology.*

Robinson, E.J., Haigh, S.N. & Pendle, J.E.C. (in press, April 2007) Children's working understanding of the knowledge gained from seeing and feeling. *Developmental Science*

Robinson, E.J., Haigh, S.N. & Nurmsoo, E. (in press, May 07) Children's working understanding of knowledge sources: Confidence in knowledge gained from testimony. *Cognitive Development.*

Beck, S. R, Robinson, E.J. & Freeth, M. (in press, June 2007) Can children resist making interpretations when uncertain? *Journal of Experimental Child Psychology*.

Nurmsoo, E., & Robinson, E.J. (in press, Nov 07) Identifying unreliable informants: Do children excuse past inaccuracies? *Developmental Science.*

Stephen Andrew Butterfill

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Telephone: +44 (0)2476 522085 (office); +44 (0)1865 793774 (home)

Present position

10.07–	Lecturer in Philosophy, University of Warwick
10.04–09.07	Research Fellow on AHRC-funded project, 'Causal Understanding: Empirical and Theoretical Foundations for a New Approach', University of Warwick

Education, scholarships and academic employment

10.01–09.04	Research Fellow, St. John's College, Cambridge
10.99–09.03	D.Phil in Philosophy, St. Catherine's College, Oxford Thesis: 'Beliefs and how they are acquired'
10.99–09.01	Stipendiary Lectureship, St Catherine's College, Oxford AHRB (since renamed AHRC) studentship St. Catherine's College senior scholarship
10.97–06.99	B.Phil in Philosophy, Wadham College, Oxford AHRB studentship Wadham College graduate scholarship
10.96–06.97	Goethe Institut *Mittelstufeprüfung* in German, grade 1 Bielefeld Volkshochschule, Germany
10.91–06.94	BA in Mathematics and Philosophy, 1st class, Wadham College, Oxford College scholarship (1992–4)

Non-academic employment

07.94–09.96	Project Officer, CHOICE (Responsible for programmes to motivate 15- and 16-year-olds to consider higher education.)

Academic activities

01.05–09.05	Associate Editor, Mind
09.04–08.07	Programme Chair for Philosophy, European Society for Philosophy and Psychology

Publications

(with Ian Apperly), 'Do humans have two systems to track beliefs and belief-like states?' (under revision for re-submission)

'Seeing causes and hearing gestures' (under review)

'What Are Modules?' (2007), Mind and Language 22: 4, pp. 450–473

'Awareness of Belief' (2001), in A. Beckermann and C. Nimtz (eds.), *Argument & Analyse*, vol. 2. Bielefeld: Mentis, pp. 362–372

'Two Kinds of Purposive Action' (2001), European Journal of Philosophy 9:2, pp. 141–165

'Review of *Thinking without Words* by José Luis Bermúdez' (2004), Mind 113:452, pp. 733–736

'Review of *Consciousness: New Philosophical Perspectives* edited by Quentin Smith and Aleksander Jokic' (2005), Philosophical Quarterly 55:219, pp. 373–375

Recent invited talks

(with Liz Robinson & Erika Nurmsoo) Extracting Knowledge from Other Minds: What do Children Understand about Question-Asking?, Department of Psychology, University of Birmingham, 29 October 2007

'Joint Action', Department of Philosophy, University of Birmingham, 29 October 2007

'Commentary on Joint action and communication in early childhood symposium', British Psychological Society Developmental Section, University of Plymouth, 29-31 August 2007

'Seeing causes and hearing gestures', The Admissible Contents of Experience, Glasgow, 20-22 March 2007

'The role of perception in developing causal understanding', University of York, 23 February 2007 and Institute of Education, University of London, 14 February 2007

'Is vision a source of causal understanding?', The Metaphysics of Science, Nottingham 10-11 February 2007

'Developing Understanding of Minds and Maps', Department of Developmental and Comparative Psychology, Max Planck Institute for Evolutionary Anthropology, Leipzig, 20 November 2006

'Is there a role for modularity in explaining development?', Department of Psychology, University of Stirling, 9 November 2006

'The role of perception in causal understanding', Royal Institute of Philosophy Lecture Series, University of Bradford, 8 November 2006

References

Apperly, I.A. & Butterfill, S. (2007), Do humans have two systems to track beliefs and belief-like states? (submitted)

Birch, S., Vauthier, S.A., & Bloom, P. (2007). Three- and four-year-olds spontaneously use others' past performance to guide their learning. Paper under submission

Butterfill, S. (2003). *Beliefs and how they are acquired* D.Phil Thesis, University of Oxford.

Campbell, J. (1992), Past, Space and Self. Cambridge, Mass.: MIT Press.

Chouinard, M. (2007). Children's Questions: A Mechanism for Cognitive Development. *Mono. of the Society for Research in Child Development. Serial no. 286, vol. 72 no. 1*

Csibra, G. & & Gergely, G. (2005). Social Learning and Social Cognition: The Case for Pedagogy, in M. H. Johnson and Y. Munakata (eds.), *Processes of Change in Brain and Cognitive Development. Attention and Performance, XXI.* Oxford: Oxford University Press.

Davies, M. (1986). Tacit Knowledge, and the Structure of Thought and Language, in C. Travis (ed.) *Meaning and interpretation*. Oxford: Blackwell

Dewey, John (1938), *Logic: The Theory of Inquiry*. New York: Henry Holt.

Dienes, Z. & Perner, J. (1999). A Theory of Implicit and Explicit Knowledge. *Behavioral and Brain Sciences, 22*, 735-808.

Graesser, A.C. & Olde, B.A. (2003). How does one know whether a person understands a device? The quality of the questions the person asks when the device breaks down. *Journal of Educational Psychology, 95*, 3. 524-536.

Harris, P. L. (2007a). Commentary on Chouinard, M. (2007). Children's Questions: A Mechanism for Cognitive Development. *Monographs of the Society for Research in Child Development. Serial no. 286, vol. 72 no 1.*

Harris, P. L. (2007b). Trust. *Developmental Science, 10,* 135-138.

Hookway, Christopher (2000), *Truth, Rationality and Pragmatism.* Oxford: Clarendon Press.

Jaswal, V. K., & Neely, L. A. (2007). Adults don't always know best: Preschoolers use past reliability over age when learning new words. *Psychological Science, 17*, 757-758.

Karmiloff-Smith, A. (1992), Beyond Modularity: A Developmental Perspective on Cognitive Science. Cambridge, MA: MIT Press.

Koenig, M. & Harris, P. (2005).Preschoolers Mistrust Ignorant and Inaccurate Speakers. *Child Development, 76(6),* 1261-1277.

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Cover letter to justify re-submission of RES-000-22-2264, rejected January 2007.

We have completely re-worked the proposal in the light of the assessors' comments, and taking into account three experiments and one pilot study we have conducted since the previous version was submitted. It is now a two-year standard proposal rather than a small grant proposal. In summary, the changes are:

1. Bearing in mind the assessors' unease, and making closer links with Chouinard's 2007 task, we have simplified procedures so that child participants do not have to understand about the knowledge gained from seeing *vs* feeling, but only about seeing *vs* complete ignorance.

2. We have answered the first two empirical questions listed in the Objectives section of the previous submission, and so these questions no longer appear in the revised proposal. First, when children aimed to identify a hidden toy and had the choice of guessing or asking the Experimenter, 3-, 4- and 5- year-olds asked for help just as frequently whether the Experimenter had or had not seen the hidden toy. This was the case whether, to elicit help, children had to say something such as "Tell me please," or simply had to raise a toy mobile phone to their ear. Second, the incidence of question-asking, and the insensitivity to the Experimenter's knowledge, was unaffected by whether the alternative to asking for help was (i) guessing with no contact, or (ii) uninformative shaking of the hidden toy's container. Importantly, there were no floor or ceiling effects that could account for these findings.

3. We have dropped question 3 in favour of more interesting questions that arise from our already-completed experiments.

4. Question 4 remains, concerning generalizable knowledge such as names or functions of novel objects, *vs* epistemic knowledge such as the identity of a hidden toy, but has been developed to take into account recent in press findings arising from another ESRC funded project on children's trust in testimony (Nurmsoo & Robinson, 2007a).

5. The focus of the theory development has moved away from implicit *vs* explicit understanding of knowledge (although that will still be considered), since Butterfill has developed that issue in work under review (Apperly & Butterfill, 2007). Instead, the theoretical focus will be on what it means to understand about knowledge, how someone might be motivated to ask questions without an understanding of knowledge (drawing on Butterfill's DPhil thesis on pragmatists' theories of enquiry) and whether the activity of question-asking could play a role in the development of understanding about knowledge.

We respond to the two Assessors' specific points as follows:

Assessor 1 was concerned that children would have learned that visual inspection is often informative about hardness: 'everyday experience may provide for an asymmetry in children's assumptions about the relevance of visual *vs* tactile input regarding colour and texture.' The experiments we have run, and the proposed experiments, involve informative visual access *vs* no access, so this potential problem no longer arises.

Assessor 2 was concerned about social and contextual impediments to children's asking for help. We agree that the general issues of rapport, motivation and demand characteristics are crucially important, but this Assessor's specific suggestions as to why children may not have asked for help no longer apply for two reasons: (i) in the studies we have completed since the previous proposal was submitted, children *did* ask questions, but asked them just as frequently whether the Experimenter was ignorant or knowledgeable; (ii) we have shown that when the Experimenter's knowledge was externalised in the form of a marked picture behind a barrier, children made a substantial body movement to look at this significantly more frequently when the Experimenter was knowledgeable than when she was ignorant. Given the similarity of the Ask and Picture conditions in terms of rapport, motivation and demand characteristics (as specified by this assessor), these factors alone cannot explain the difference in results between conditions.

We are aware of Mitchell and Bennett's ESRC funded work on children's judgments about their own self-knowledge, and of Waterman's BJDP 2004 study, and will make links that are appropriate.

In one of the studies conducted since the previous proposal was submitted, we checked on any influence of children's 'need for autonomy' as mentioned in Assessor 2's comments in his or her section headed 'Age.' On each trial children aimed to identify a hidden toy, and were given the choice of guessing for themselves or asking the Experimenter, who had either looked at the toy or was as ignorant as the child. We compared the effect on the frequency of asking for help rather than guessing of:
(i) giving children an unambiguous clue to the hidden toy, rather than telling them the answer directly, thereby allowing them to feel they had solved the problem themselves. This neither increased the overall frequency of question-asking, nor increased sensitivity to whether the Experimenter was knowledgeable or ignorant; and, as mentioned in 2 above,
(ii) giving children the option of uninformative shaking of the container with the hidden toy, rather simply guessing without any contact, thereby allowing them to fulfil any desire to act for themselves even if such action was uninformative. This neither decreased the overall frequency of question-asking, nor affected sensitivity to the Experimenter's knowledge state.

Presumably the questions posed in the previous submission did not excite the Assessors sufficiently for them strongly to recommend funding. We hope our thinking has now developed sufficiently for a much clearer and more persuasive argument to be made in the revised version.

Elizabeth Robinson
Steven Butterfill
04 December 2007

Progress report on RES-062-23-0335: Children's handling of uncertainty: The influence of an unknown reality.

The project began in January 07 with the appointment of Jamie Pendle as the RF. He had conducted the pilot work on adults' and children's preferences to guess the fall of a die before *vs* after throwing. We therefore decided to begin with the research arising from this pilot work. We have completed this successfully and have also begun to examine children's certainty judgments, and children's acknowledging possibilities under different determination conditions. As we were aware from the outset, Jamie Pendle resigned from September 30th to join a Masters conversion course in computer science. On November 1st Kerry McColgan took up the research post, and she very quickly became familiar with the work done so far and had begun collecting data by the end of November. In summary, the project is running well, is making good progress, and we have no reason to expect problems in the future.

04 December 2007

Appendix I: Summary of Typical procedures for the Ask and the Picture tasks.

1. The Ask task with 'phone for help' and explicit options on each trial

On each of a series of trials, the child sees three identical boxes and opens them to reveal a different toy in each. The toys are returned to their boxes, which are placed in an opaque bag, shaken vigorously by the child, and then one box is tipped out. The child aims to find out which toy it contains, and to tell a toy frog. The trials differ in the options offered to the child to enable her to give frog the correct answer. On every trial one option is to ask the Experimenter, who has either looked or not looked inside the box. The alternative is to guess, or to look inside the box. Hence on some trials, asking the Experimenter is the only way to ensure that the child can give Frog the correct answer, whereas on others it is not useful, although it is not strictly wrong to ask. Hence should children ask for help on every trial, or on no trials, the results would not be interpretable. In practice children ask on some but not all trials, and we can therefore examine whether they are more likely to ask when the Experimenter has seen the hidden toy than when she has not.

On the first *warm-up trial*, the child is invited to look inside the box and tell Frog its contents. On the second practice trial, the Experimenter has a look, says that she knows what is inside, and says to the child "You don't know which one it is do you? I've had a look. I can tell you which one I think it is." The child is then shown that if she raises a toy mobile phone to her ear, the Experimenter will say which toy she thinks is in the box. The child then tells Frog which toy is in the box, and Frog, operated by the Experimenter using a distinctive voice, finishes the trial by saying "Thank you."

Experimental trials follow a similar procedure except that on each trial children are given two options. One option is to ask the Experimenter, who has either looked or not looked inside the box. When she has looked, she announces that she knows the box's content, and when she has not looked she announces that she does not know. The other option is to guess. For example, when the child's choice is between asking the well-informed Experimenter or guessing, Frog says, "I wonder which toy it is. Can you tell me?" The Experimenter then says, "I had a look didn't I. This time, you can just have a guess and tell Frog which one you think it is, or you can phone for help and I'll tell you which one I think it is. What's the best thing to do to make sure you tell Frog the right one? You guess or you phone me for help?" The question is accompanied by nonverbal support to help the child grasp the options. The order of options is counterbalanced between children. A check that children understand the procedure is if they choose to look for themselves when that is an option.

On *Filler trials* the child is given the option of looking inside the box herself or asking the Experimenter, who has either seen or not seen.

2. The Picture task with explanatory warm-up trials instead of explicit options on each trial, and with the child having an initial guess on each trial

At the start of the game the child sees three toys and a strip showing three matching pictures, and the child places each toy on its picture. The Experimenter shows that she has the same pictures, as does the Frog. Child, Experimenter and Frog choose markers (differently coloured blocks) and practice placing them on one of the pictures indicate one of the toys.

As in the Ask game, on each trial the toys are placed in identical boxes, shaken up in an opaque bag, and one is tipped out, and the child aims to correctly identify the toy. The Experimenter places a barrier between her and the child so that each cannot see the other's pictures (although the Experimenter can judge where the child's hand moves to place her

marker and so can infer which picture she has marked. The Experimenter's movements do not allow the child to make a similar inference).

On all trials, the child and Experimenter each make their own judgments, and a final judgment is then made on behalf of Frog.

On the first *Explanatory Warm-up trial*, the Experimenter explains that she will not look in the box, but simply make a guess about the contents of the box. She then places her marker on her guess and the child is invited to look around the barrier to see her marker placement. The child is then allowed to look inside the box, and is invited to place her marker on one of the pictures to show which toy she thinks it is. To place a marker for Frog, the Experimenter explains that she is not allowed to look in the box, but she is allowed to look at the child's marker placement, and by doing that can find out the right answer. The Experimenter models standing up to look over the barrier, and copies the child's marker placement. The box is then opened to reveal the hidden toy. On a second Explanatory warm-up trial the child makes an initial guess without seeing inside the box, the Experimenter looks inside the box and places her marker on a different picture. The child is told to look over the barrier at the Experimenter's marker placement, and why this helps. The child then places a marker on Frog's set of pictures, and the box is opened to reveal the hidden toy.

On the *Experimental trials* the child always makes an initial guess without having seen inside the box. The Experimenter either looks or does not look inside the box, and places her marker on a different picture from the child's. The child is then invited to place a marker on Frog's picture. We are interested (i) in whether or not the child stands up to look at the Experimenter's pictures more frequently when the Experimenter has seen the toy than when she has not, and (ii) whether, when placing a marker on Frog's pictures, she matches the Experimenter's marker more frequently when the Experimenter has seen the toy than when she has not.

As in the Ask task, *filler trials* are included on which the child is allowed to look inside the box, such as in the first Explanatory Warm-up Trial.