Exploring babies' and young children's development and learning

Exploring cognitive development

Narrator:
Alison Garton is currently Adjunct Professor or Psychology at Edith Cowan University in Perth, Australia. She is a chief policy advisor on child health and child protection issues to the Western Australian government and a past Director of the Australian Psychological Society. At the start of her career as a developmental psychologist in the 1970's, she was a member of Jerome Bruner's research group at the University of Oxford. This led to her life-long interest in children's learning and language development. Alison is the author of the set text Exploring Cognitive Development: The Child as Problem Solver.

Alison:
I was motivated to write the book because I wanted to consolidate much of the research that I'd done over the previous years, particularly the work that had been conducted by students which had sort of moved the field forward ever so slightly and really required bringing together in one spot so that I could then move the research on to its next phase. And I also felt that the time was right to write a book around some of the socio-cultural aspects of children's learning and to bring together different theoretical perspectives and try and consolidate those as well, and also use them to move the area onwards.

I've been working in this area for quite some time, driven originally by a sense that I was interested in what happened when children worked together and that then became why are two heads better than one? And really looking at all sorts of reasons around why that situation helped children in terms of their learning. Now when you boil that down to conduct a study you end up having to isolate a particular part of the process, so you're only ever looking at one little element within that, so I've looked at different tasks that the children use when they work together, I've looked at the language that the children use when they work together, I've been looking at the levels of empathy between children as they work together, so there's all sorts of little bits and pieces that seem to have been looked at in, and I think what I was wanting to do is try consolidate those in order for us to perhaps think a little bit more broadly about the whole situation rather than just looking at pairs of children working together, pairs of same sex, same age children working together, which is what the research typically is.

Int:
In her book, Alison explores the differences between Piagetian theory and Vygotskian theory: here she explains why she thinks it is important to try to arrive at a synthesis of the two.

Alison:
I do think they complement each other but there has been some sort of view that you sort of pit the two against each other because they are superficially quite different. Piaget emphasised the individual, had a stage theory of development and so on and so forth whereas Vygotsky, on the other hand, was much more interested in how the socio-cultural environment assisted the child to learn. But the fact remains that these theories have been the ones that have underpinned virtually every other theory that has followed since the 1920's, that has looked at children's development and many of the contemporary theories or some of the ones that follow, maybe not so much the contemporary ones, have either misconstrued Piaget or misread Piaget, or misinterpreted Piaget, and similarly with Vygotsky, and I've spent many years reading both of them, and some of the Piaget work in the original Swiss French and it's interesting to see what they actually said about the child's development if you dig right down, rather than looking at other people's interpretation of what they said, which does tend to polarise them much more than I think that they are. I think that we can combine elements of both of their theories - we shouldn't be taking one interpretation over

another interpretation, that it's not either Piaget nor Vygotsky and there are elements of both, and I thought that was quite interesting.

Narrator:
Towards the start of her book, Professor Garton says that it's always been her belief that children require social support to learn. So why is it that until fairly recently psychologists have tended to ignore that aspect of children's learning?

Alison:
Well if you want the blunt answer it's because it's really hard to do the research. It's much easier to isolate elements of development. When we did all the original Piagetian sort of experimentation, conservation and so on, the child was in there with the experimenter on their own. But moving into looking at children in social contexts, you add so many more variables that in fact people were very nervous about moving into this area with children. To begin with we used to run copious numbers of videotapes and spend hours and hours and hours analysing them, looking for minute detail. We've got more sophisticated now; we've actually got more sophisticated recording techniques. We've actually got more sophisticated statistical analytical techniques so we can actually do some of this more complex research much more easily than we ever could in the past, so that's one of the reasons, it was much easier just to sit a child down and get them to, you know, manipulate rows of counters or horses and cows, and those sorts of things, and I suppose from a personal point of view, from reading and that's why I said it's my belief that some sort of social support is necessary because in fact, even when you read Piaget he didn't actually say the child didn't need social support or didn't need social interaction in order to learn, it's just that the way the emphasis came through in the subsequent research so I think that, we can introduce the social element and we can introduce it in a much more creative way, and we can actually look at how some of these social processes work with children.

Narrator:
What is it that social support brings to children when they're learning? What advantage does it have when children are actually learning together rather than trying to tackle something as an individual?

Alison:
Well if we go back to Vygotsky and this is where I've found that this was, a zone of proximal development which found its way into the literature and gets interpreted as an entity which of course it isn't, it's a hypothetical construct, but it actually describes the space between what the child can do on their own, on his or her own, and what the child can do with some adult or, older peer support, so that gave voice to some of the views around the need for social support and the zone of proximal development as a construct, that should be a very useful explanatory device that people have used over the years and, again, it's got more sophisticated over time as to what this actually entails, but I think it describes the need for the child to be either pulled or pushed, or challenged or whatever in order to reach that next step and I think we can capitalise on that when we work with children and use that notion that a more capable partner can assist a child to learn.

What you have to do is identify what it is that is the focus of attention and so that both parties are focused on the same thing, and work out what it is the child knows about. A good example is a jigsaw puzzle and it's been used extensively in research, and with something like a jigsaw puzzle the parent in this case will start to build up the jigsaw puzzle and then ask the child to pick up a piece and put it in, and do that, you know several times, and then with the aim ultimately of the child being able to do this puzzle on their own, so that's the movement from the inter-personal to the intra-personal, so what you're doing is you're actually helping the child by small steps, by making sure that the child understands what's going on and you're focused on the same thing, but through these small steps helping the child to do an activity on his or her own.

Narrator:
What about the same-age peer-to-peer learning that very often happens during pair working or group work in schools?

Alison:
Well this is where it gets a bit tricky and I mean I think this is where classroom management skills come in because you really have to be quite careful about which children are paired together because even when we work experimentally with children we can get seriously what we would call mismatched children so you have to, again, tell the children this is what the task's about, you need to make sure the task they work on together is a similar task to the one where their competence has already been identified. Now when you don't do this carefully you can end up in situations, where one child completely dominates the other child, and so that's usually the more competent one which defeats the purpose of the activity, and we have tried not intervening but actually reminding the children that they have to work together you do have to be very careful in the classroom. I'm sure teachers say yes, it's all very well, we've got this lovely research, but it doesn't work in the classroom, but it can be made to work, but it does require a certain amount of sensitivity on the part of the teacher to what children's abilities are and what the particular task is, it's not just a case of seeing children work in pairs, it's a case of identifying children who have strengths and weaknesses, and capitalising on that.

You need to be aware of children's abilities and limitations as well, and it's not simply their competence, it's things like their inter-personal relationships and the way they interact with others as well, it's not simple, it's not just a case of saying, you know, Johnny go and work with Jimmy, it's more complicated than that.

Narrator:
How do Alison and her students go about analysing what's going on in an interaction in terms of what a pair of children are saying to each other?

Alison:
Well you obviously have to transcribe either the video or the audio, depending on what you've got, but then you have to go through it and really start making decisions about what it is that you think is going to be important, and people will argue that you've chosen the wrong categories for your interpretation of the language but what I've always done is once those categories have been determined we then apply them, and two people do that, and I look at the extent of the agreement between the application of those categories, and if we're somewhere between, round about 80% agreement, I think is pretty robust for language data, the transcribed data, hopefully they're accurate data.

Narrator:
Alison is also interested in the empathy and inter-subjectivity between children when they're working together.

Alison:
Inter-subjectivity I've defined as a meeting of minds and that's probably not new. It's what you would find within the zone of proximal development, it's where you want to get the two minds working on the same activity thinking, if you like, almost in the same way. They need to share and understanding of the task, they need to both understand what it is that they're trying to achieve and trying to work towards. Now, that can be done through discussion, and children don't do this, they always launch straight into you know playing with the experimental materials, but in an ideal world they would sit down and they would discuss what it is that they're trying to achieve. The mother and child with the jigsaw is probably a better example, where the mother would be explaining what it is that she's wanting to achieve in them working together, so there would be some, possibly some talk about the joint achievement of this particular task. Ultimately what you want to find is that that each partner knows that the other shares the same understanding about what it is they're trying to achieve because you really are getting a meeting of minds, and so with the jigsaw both parties know that what you're going to do is, you know, create the picture that matches that one on the box, with the pieces that are available, and that's done through the mother showing the child how to do it, and then ultimately the child doing it on his or her own, so there is a joint understanding. Now, that can be facilitated by there being greater empathy between the parties, we call it sensitivity. And the idea would be to measure children's sensitivity to see if that was a factor in their capacity

to demonstrate or achieve inter-subjectivity because at the moment we don't have any way that we can measure that except by looking at the outcome, that is we can look at them successfully achieving the goal, inter-subjectivity is important but it's one of these things that's actually quite difficult to measure, it's a proxy measure is the outcome measure, but we wanted to have a look at a input measure as well to see if that was part of the equation.

Narrator:
What should teachers be looking for when trying to assess what individual children have taken from the interaction and what they've internalised?

Alison:
That's a good question because I think that's what, it's this translation of this work into classroom activities and classroom organisation that is a challenge. The best we can look at are the proxy measures for success namely, I guess, children being able to achieve more, I've seen this working for example in a maths classroom, this is probably the best example where children work on problems together and you've got some children who actually manage to work out the problems, and you know they're working with another child, what you're wanting to demonstrate is that the originally less competent child demonstrates an understanding of the mathematical concept that they're learning, and sustain that over time. And also, I mean by the same token, and this is one of the conundrums of the research, to make sure that the more competent child doesn't go backwards. You're actually assuming that that, particularly with children, the older peer has a robust competence that it's, you know, sustainable and isn't, isn't wobbly. That's your measure that there has been some success is that the child has benefited from the interaction with the other child, and they've both been focused on the task and there's been some form of interaction, I mean you can't just sit them side-by-side, you have to encourage interaction and sustained interaction between the children because they need to talk to each other, they need to be active in the process, they can't be passive, either of them.

Narrator:
In her book, Peer Interactive Minds, Margarita Azmitia says that the individual needs a period by themselves afterwards where the learning that's taken place in the group can sort of bed down, essentially a period of Vygotskian collaboration, followed by Piagetian assimilation and accommodation.

Alison:
I think that that's a very fair observation, I think that that is the case, I mean this is back to moving from the inter-personal to the intra-personal, you've got to make sure that the accomplishment or the learning, or whatever is consolidated in the child, and that's done, with the child either on their own or spending some time just making sure that that ability is understood. In the Piagetian model where you actually check that children have learnt things as you ask them to justify what they've done and I guess you could do the same thin, if you've adopted a Vygotskian framework, where you've got the child you could then say well, what is it, you know what's the principle underpinning what you've learned here, and do that over time to make sure that the child understands. A lot of the work on conservation some thirty years ago was exactly that, was actually identifying what it was that the child had learned, and what was the principle that the child had understood from the conservation task that he or she had just done.

Narrator:
The field of cognitive variability and new models of cognitive development such as Robert Siegler's are much more focused on the individual child and variability within the individual child.

Alison:
Siegler's work's been very influential and not just in my particular areas of interest. His work has certainly led us to rethink things about individual, it is about individual children but nonetheless he still sees a child as being situated in more of a social environment, his theory and his model are very much at the individual child level, he's very interested in the broader picture of the child, and so I think most of the models even these ones like Siegler's, are

actually embedded in, a broader view of the child's development and learning, and while he's been drilling down and very, very specifically, and has actually picked up some of the old Piagetian concepts like conservation and class inclusion, and has actually been re-looking at them in terms of his model which I think is really interesting. And again he's been facilitated by the fact that we've got better technology to help us do some of this work, both in terms of filming children and in terms of undertaking much more sophisticated analyses and interpretation.

Narrator:
Siegler talks a lot about the micro genetic method, which seems to require detailed analysis. What is different about the micro genetic method of analysing what a child is learning in a problem solving situation compared to just coding and categorising what's going on?

Alison:
I guess what they would argue is that they are drilling down as far as they can go to look at what children are actually doing, and using that information not to try and come up with a theory or a model of how children work, which is what we were trying to do before, so there was one size fits all, they're actually acknowledging that there are possibly different ways of going about things, and children may approach a task depending on their circumstances – their prior knowledge, or their age, or whatever – in one way, and then on another day or another week approach it in a completely different way and he acknowledges that there is variability in strategy use when approaching different tasks may in fact be a marker of cognitive change, so rather than being something that was a bit of a nuisance, it's actually seen as a strength rather than a weakness, because what we were looking for, you know, previously were nice ordered markers of children's development and their learning, whereas what his model and others models are saying is that this may actually represent children trying out different things and then coming to what is the best method, the best approach for them and I think that these changes signal that the child is actually thinking about the task or the activity, rather than the child either being difficult or the child not knowing what to do, so you actually say well let's look at all these different strategies and see what's going on here and he comes up with a model that doesn't have a single trajectory or a single set of steps, it rather has these overlapping waves where different things can be tried at different times.

Narrator:
What do studies like these reveal about metacognition, how children reflect on their own learning and the strategies they use?

Alison:
I think they are beginning to tell us a little about metacognition because we can look at what the child knows about the task so we can ask the child, what it is they're trying to do, so the sort of the justification after the event because it's knowledge about the task, knowledge about the activities, so it's about their learning, it's reflecting on their learning so it would be part of their sustained understanding, what they've been doing in the task and how they've come to achieve or accomplish what it is that they are being asked to do,. There is some relationship between I guess it's social interaction, inter-subjectivity, metacognition are in some ways interrelated and I've, begun to explore some of that but at a very much at a conceptual level, trying to define what the common elements are and how you would measure them is actually proving to be quite challenging.

Narrator:
What does Alison see as the main messages that emerge from her book, Exploring Cognitive Development: The Child as Problem Solver?

Alison:
I suppose we would like teachers and developmental psychologists to look not so much of what it is that children are doing but how they are doing it, so look at, the processes, the strategies that they use,– I think what we've learnt over recent years is that, as I said, one size doesn't fit all, children go about things in different ways, so I think we need to recognise that variability and not impose our ways of doing things on them, for example when we went to school we were all taught to add and subtract in certain ways, there are other ways of

doing addition to subtraction to the ways that we were drilled in and I think we have to recognise that, some children find some ways easier than others obviously, so that would be one message - to focus more on the process than the outcome. I would also like teachers to think about how they can manage their classrooms so that they can allow children to work successfully in pairs because there are, there are clear advantages to children working in pairs, even though we don't know the full story yet, we know there are advantages to the children, and there can be advantages to the teacher too. The other thing would be to allow children to talk to each other and I think that that's much more acknowledged in classrooms now that talking to one another helps. Most teachers will know about the zone of proximal development and I think that we need to make sure that people understand that it's a construct, it's not an entity that they have to cross like the road, it's an idea where both teaching and learning play a role together so it's not just a teacher, and it's not just a learner, you need both parties there, and I think that that needs to be understood as well.