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Research proposal

To explore whether children of varied early age groups have different memory skills compared to later age groups.

Rationale for the study

Childhood memory skills are important for further development in our lives. The main role in this memory development takes place in our brain. Children develop their memory at an early stage because of fast brain development. At this stage children start to show better planning abilities as well. They can start to think in the sequence and they are able to plan ahead. The ability to recall an act is developed at this stage also. With growth this ability slowly improves. Children imitate role play from their caregiver until a child is able to perform the activity without help or prompts.

Elicit imitation was used to compare children’s age 18, 24 and 30 months on their ability to recall a variety of tasks without any delays or mistakes. The main hypothesis is that the children in later age category have a better ability to recall tasks compared to children in an earlier age category.

Haden at al. (2009) study was used as a basis for this present study. Haden at al. study was to explore Elicit Imitation tasks and also work on memory location; finding hidden objects and learning new language skills. This present study aims to explore and compare Elicit Imitation tasks and to find the relationship between a child’s age and performance to recall sequences and language skills.

Elicited Imitation tasks are used in teaching children memory skills (Bauer, 2006). Memory is an important process where our information gets processed, stored and later retrieved. Elicited Imitation is part of the working memory and the study tasks for the children and will be based on visual-spatial sketchpad (Baddeley, 2000). Recall memory is also used to retrieve previous tasks and learned information. For example, children will be asked to re-produce a set of actions which had been shown to them previously without a delay between demonstration and reproducing the action. To asses an infant’s memory recall we mostly use deferred imitation technique and elicited imitation technique. Deferred imitation technique shows that toddlers are able to recall sets of actions which were shown to them four months previously, this is when they are asked to perform this set of actions again. In Elicited imitation technique, which is very like the previous technique, with the difference being that toddler demonstrates the performance immediately without delay. In this technique the toddler can recall the performance task again twelve months later (Meltzoff, 1995).

Children’s memory emerges at different developmental stages and the task performance is based on recall performance. Children’s working memory uses remembering points to reproduce demonstration of tasks shown to them by the examiner. Children can remember the task points after a certain delay of performance. As a child gets older their memory performance improves when their performance tasks can have longer periods between tasks to recall (Bauer, 2000).

The study above indicates the main hypothesis describing the development of children’s early memory skills.

1. Children in early stage of 13 – 24 months have the ability to recall tasks with – 5 steps sequence performance observed in early stages. For example; putting a doll in the car and taking her for a ride, taking the doll out of the car and placing her on a chair, serving her a piece of cake with the doll eating the cake (Bauer, Hertsgaard, & Dow, 1994).
2. Task sequences which are delayed for more than six weeks and are able to be performed without repeated observation. For example; picnic performance in steps: spread blanket, put a teddy bear on the blanket, cut the cake and place the cake on a plate and feeding the bear with the cake (Bauer, 1996).

The Haden et al (2009) study is concerned with the valence hypothesis and proposes the processing of children’s early memory skills at different stages of early age. The research investigated the response of task performance in each developmental stage with different tasks performance, by increasing the number of steps performed depending on the age and the delay of task recall performance. Their hypothesis was that children would recall each steps of performance after a delay with minimal or no mistakes when recalled. They found that the number of performed activities and pairs of activities done at each stage of age reflected the age difference and higher levels of skills of immediate and delayed performance, this was observed by 24 and 30 months age children compared with 18 months of assessment. They concluded that they found an advanced maturity of the children in different and elicited imitation age groups depending on the ability of increased task steps related to the difficulty and limited time of recall delays.

In this part of the study different and elicited imitation paradigms permitted to observe the age of the children and their development process (Mandler, 1990). This task proved that children, when shown a task at an early age could reproduce this at a later age, this behaviour was consistent with the direct act where children during early phases of learning observed steps of tasks and later on are asked to perform the observed steps. Each child had a predetermined time for each task. The different stages of early age, and similar were asked to repeat, as close as possible to the original learning session. Every child is observed individually and the ability of recall is assessed depending on the recall of the task performed. The lack of verbal statement which is emphatic and explicit is needed for fast learning and task performance repetition, so previous observation of performance is required for correct repetition (Carver, Bauer & Nelson, 2000). With each stage of task performance the children needed to adapt the previous observation of the task to their own situation. Different and elicited imitation request processing, using multiple sensory skills, which children use while processing these tasks like their auditory and visual senses (McDonough, Mandler, McKee& Squire, 1995).

Different methods can be used to assess and analyze cognitive capability based on different and elicited imitation studies. Findings which are present are age dependent & complex depending on when task performance is increased, for example, the number of steps in the task increase and recall period is delayed. For instance, children at a certain age have specific performance skills of different imitations tasks where steps are present when asked to repeat them after a 24 hour delay and children at an earlier age can perform these without a delay (Collie & Hayne, 1999). Children nine months of age are able to perform multiple steps repetition which they have observed, with delay from the adults after a few weeks with no prompting, which supports the theory that children are able to recall steps after a certain period of time with same sample and sequences for memory assessment (Carver & Bauer, 1999).

The present research will link to Haden et al. original paper where researchers wish to explore dependence on ‘Elicited Imitation’ task performance and dependence on age and performance of a child’s working memory.

Type of design

Longitudinal mixed ANOVA design 2 x 3 between participants quantitative design study – using age group and task performance as a comparison group

It is felt that in order to further Haden et al. (2009) study, an interim study with aforementioned number of variables and conditions is necessary.

Independent variable –

1. First independent variable ages – 18 months, 24 months, and 30 months.
2. Second independent variable – performance tasks: immediate recall, delayed recall.

The performance tasks were presented twice to each child, first with immediate recall and second with delayed recall.

Dependent variable – number of correct responses of presented tasks.

The hypothesis is that children 30 months of age will score higher in the recall delay task than children in 18 and 24 months of age.

Participants

The study will comprise of a sample from participants recruited from the wider population such as friends’, family & work colleagues’ children etc, of the researchers. 40 children in total will be recruited, of which 20 will be male participants and 20 will be female participants. The researchers intend to run a pilot study to establish and eliminate any errors in the experiment design. Age ranges will be limited to the participants of 18 months of age at the beginning of the first visit of the assessment.

Participants (parents) will be advised that the study should take about 1 hour.

Data will be collected in person, face to face. Once the data is collected, the data sets will be analysed using SPSS.

Children’s participation is to be obtained by rewarding them with toy gift on the test completion. This will be decided by the researchers.

Study test material

Real material will be use for each task from the researcher’s own resources, for example teddy bear, blocks, hats, papers, stickers, ball, doll, cups etc.

Procedure

Children will be visited three times in their homes. First visit will be at 18 months of age followed by a visit at 24 months of age and finally at 30 months of age. Visit scheduled will be based on review of the “Elicited Imitation” task literature (Bauer et al., 2000) to achieve a goal, that children of specific ages will recall specific tasks after delay. The specific test will be administered according to tasks appropriate to the particular age. Tasks procedure of ‘Elicited Imitation’ was adapted from Bauer’s (2000) work and each child will have a set of specific tasks and tests models to perform. Each specific task test such as length, tests and type is described below. This test starts with a period where children get familiar with their tasks & materials such as toys etc. The presentation will follow a target sequence where children can see and manipulate the toys as they wish.

‘Elicited Imitation’ procedure use specific model action steps individualized to each child. Each child age has a number of specific steps of the task, 18 months of age will have a three step task, 24 months of age will have a five step task and 30 months of age will have a seven step task.

* First research model test with three steps at 18 months of age will be as follows:

1. In this test the child will be encouraged to take an empty box, put marbles into the box, close the box and make a sound by shaking the box.
2. On this test, the child will be encouraged to take a doll, put a coat on the doll, put a hat on the doll and place the doll in the stroller.
3. This test will encouraged the child to work with play dough, take play dough from the box, spread the play dough on a mat and cut shapes with a star form.

* Second research model test with five steps for a child, 24 months of age, will be:

1. In this test the child will be encouraged to taking doll shopping; put the doll in the shopping cart, place cookies in the cart, place vegetables in the cart, pay at the cashier, and take out the shopping and place it into the car.
2. With this test the child will be encouraged to build a race track; the child will take play blocks and build the course, he/she will take a car and drive over the course, build a bridge, drive the car under the bridge and park the car in the garage.
3. In this final test the child will be encouraged to cook soup; child will take a pot, put vegetables inside, build a stove from play blocks, place the pot on the stove and serve the soup on a plate.

* Third research model test with seven steps will be:

1. In this test the child will be encourage to build a living room; Child will take a sofa and will place it in the corner, take play blocks and build a closet, put in place a table and chairs, take a doll and sit the doll on the sofa and serve cake to the doll.
2. In this test the child will be encouraged to play with sand; he/she will place sand forms on the sand, put sand in them, then put the forms upside down and make patterns with stars, dig a hole into the sand, place a carrot in the hole, build a hill with the sand.
3. In this final test the child will decorate a cake; He/she will bake a cake, take it out of the form, place stickers on the cake, put sprinkles on the cake, place the cake on the tray, cut the cake and place it on a plate.

Children will be instructed with their tasks by showing them first what you would like them to do and then they will repeat the same action immediately and after some delay. All these tests will be done in three stages at 18 months, 24 months and 30 months with two repetitions as immediate recall and delayed recall.

Data analysis

All the results from the tasks performance will be recorded for later analysis. In the test of ‘Elicited Imitation’ the score will be for each memory test; i.e. as immediate performance and delayed performance. It is expected from previous researches that children will have a better score on tasks previously performed even before the repeat task is presented by the researcher.

At each age points will be allocated on the bases that the study expects that delayed performance be better than immediate performance. In the current study the assessment

across the children age groups outcome is expected to either support or invalidate present study.

Ethical Consideration

Consent

The researchers intend to protect the dignity and welfare of all of our participants. As such they will be given the right to anonymity relating to any scores published or personal details. Researchers will obtain informed consent from all participants(Guardian) in this study and researchers do not consider that any risk or threat to their welfare will arise from participating in this study.

Prior to investigation each participant(Guardian) will asked to complete a consent form (Appendix 1) stating that upon invitation they have agreed to participate and understand what they are being asked to do. The consent form will be to explain that they have agreed to take part in this study and the data obtained from testing them will be used for this study purpose only. The form will inform them they have the right to withdraw at any point from the investigation.

Deception

It is not intention of the researchers to use any means of deception in this study, since it is not required for the purpose of the study.

Debriefing

Participants (Guardian) will be debriefed and further information on the research will be made available as required.

Withdrawal from the investigation

Participants will be able to withdraw at any time without having to provide a reason and will be able to ask questions as they arise. They may also withdraw their data at any time should they wish to do so.

Confidentiality

Participant’s confidentiality will be assured in so much as they will be given the right to anonymity relating to any scores published or personal details.

Protection of participants

Research will intend to ensure there is no fabricated data within our publications and should it be discovered that any data that is erroneous, the researcher will take appropriate steps to retract any such data. Researchers will ensure that credit is acknowledged to previous research through appropriate citation.

Implication and Application of this study

* Evaluation of children’s responses on performed task and ability to recall early memory skills. Children memory recall starts from early childhood, more study research on these themes especially the non-verbal aspects of memory recall.
* To point out if the same children, through a period of time, display cross information with childhood development and task performance, and so point out a model of association across the different stages of development.
* To help assess children on their non-verbal memory - the means and degree of performance, which were discovered in this study, and every memory task reproduced and similar findings in previous research studies, regarding children’s’ memory development, and their age were similar to the task performance skills (Bauer, 2000). Association between age and gender, on the task performance, and steps of task performance, affects the non-verbal memory development (Bauer at al., 1998)
* This study can also be used in children using a cross-section of ages to demonstrate that in some experiments, older children, 21 – 25 months of age can better recall on immediate performed task performed in the current assessment of children at 24 months of age, only. A wider range of ages can explore immediate and delay in memory recall (DeLoache, 1985). More study is needed in future to assess the working memory performance as pointed out by Reznick et al (1997) study where more delay with children of an early age for retrieving delay recall on performance task.
* Assessment of the study can be also implicated in young children remembering, were researchers to investigate and analyse children language skills in different stages of development and language understanding skills and other areas of cognitive development (Rakison & Oakes, 2003) were this to be linked between memory and language skill. Remembering and failure to remember with these tasks can be used to demonstrate what goes on in the children’s memory at certain ages and what language development are associated at each age of the children.
* For future research language development and children memory skills are two aspects that will need more investigation in the relation to verbal and non-verbal children language (Bauer, 2006).

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**Participant Information Sheet and Consent Form**

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**A study of different recall memory skills by children in early stage of age**

Please take a few minutes to read the following information on this research carefully before you agree to participate. If at any time you have a question regarding the study, please feel free to ask the researcher who will provide more information.

This study is being conducted by Katerina Holeckova, third year undergraduate psychology student at The University of Derby. It aims to investigate if whether children of varied early age groups have different memory skills compared to later age groups.

In this research your will be presented with performance tasks were children will be visited in their homes three times. Each performance task will be performing to the child and they will be asked to immediate repeat the task and after some delay. Each task will have three tests with three steps at 18 months, five steps at 24 months and seven steps at 30 months. The Child will be asked to repeat simple play performance task, for example: take a doll, put a coat on the doll, put a hat on the doll and place the doll in the stroller…

Of course you are not obliged to participate in this research. You may also withdraw from the study at any point without giving any reason. In this case all of your responses will be destroyed and omitted from the research. It is not envisaged that participation in this task will lead to any detrimental effects, however you will be provided with a full debrief at the conclusion of this study. If you agree to participate in and complete the study, all responses will be treated confidentially. Any identifying information will be kept securely and separately from the rest of our observation sheet. You also have the right to withdraw for up to 7 days after taken part.

Please indicate your age: \_\_\_\_\_\_\_\_ Male: \_\_\_\_\_ Female:\_\_\_\_\_

To signify your voluntary participation please completes the consent form below.

**Please tick the boxes to confirm that you agree to each statement.**

1. I confirm that I have read and understood the information sheet for this study and have had the opportunity to ask any questions.
2. I understand that my participation is voluntary and that I may withdraw from the   
   study at any time without explanation.
3. I agree to take part in this study

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Name Date Signature

**Appendix 1**

**Participant Debrief Form**

Thank you very much for participating in this study. Please take a few minutes to read the following information, which will explain the aims and purpose of the research further. If you have any questions, please feel free to ask the researcher.

This experiment investigates whether children of varied early age groups have different memory skills compared to later age groups. The purpose of the study was to investigate if children of different age groups 18, 24 and 30 months old have better memory recall in immediate recall tasks or after delay based on the study done by Haden et al. (2009).

If you are interested in finding out the results of the study please contact the researcher (contact details below).

If you wish to withdraw your data at any point up to 7 days after taking part, please contact the researcher. You do not have to give a reason for your withdrawal.

Please note that if after participating in this research you experience any psychological effects please contact student support services or counseling services at University of Derby, tel. 0044 1332 590500 or contact your general practitioner if you experience any health concern.

Once again thank you for your valuable contribution to this research. Your participation is greatly appreciated.

Yours sincerely,

Katerina Holeckova (kacaholeckova@yahoo.com)