**Letter to Preschool Centre Manager**

Dear Centre Manager,

We would like to invite children aged 4-5 years and the educators at your centre to participate in a study conducted by researchers from the University of Wollongong. The project is entitled: ***Active games and cognitive development in pre-school children.*** We write to seek your approval and assistance to conduct this research.

Pre-school children’s cognitive development includes the development of executive functions, which are responsible for formulating goals, planning how to achieve them, and carrying out these plans effectively. Executive functions are strong indicators of school readiness and later academic achievement,and are linked to children’s development and behaviour. Studies in school-aged children suggest that being physically active may support children’s cognitive development. Although children experience rapid improvements in cognitive development and executive functions during the pre-school years, little research has investigated the influence that active play and physical activity may have on young children’s cognitive development. The purpose of this research is to investigate whether participation in active games (i.e., activities that require children to engage both physically through movement and mentally through involving problem-solving and cognitive challenges) influences pre-school children’s cognitive development. If so, this would provide a simple way for educators and parents to engage and enhance young children’s cognitive abilities while also supporting their physical health and development.

Approval is sought to visit your centre two days per week for 6 weeks, at days and times that you deem to be minimally disruptive to your centre’s operations. The first week would entail brief individual assessment of children’s executive function abilities, via **four iPad-based games**, in a single session of approximately 20-minutes. These games require children to exert control over their thoughts and behaviours to catch fish, sort cards and identify objects that match verbal instructions. Electroencephalography (EEG) will also be used to safely record children’s brain electrical activity. EEG is 100% safe and pain-free. Children will be **fitted with an EEG measurement headband** which will measure brain electrical activity from one location on the forehead. The EEG measurement headband contains a single, dry sensor that rests gently against the forehead, and an ear-clip sensor. The headband takes 10-30 seconds to fit. Children will wear this headband while they are carrying out the Executive Function tests and prior to the tests during a 6-minute resting task. Finally, to understand children’s typical level of physical activity, they will be asked to **wear an activity monitor** (known as an accelerometer) **on their waist using an elastic belt for one week while at the centre and at home.** Children will be asked to wear the monitor during the day and night, but monitors will be removed for water-based activities such as having a bath. The monitor is similar to a pedometer and is small, light and unobtrusive.

For the purpose of the study centres will be randomly allocated as either a control centre or an intervention centre.

Over the subsequent 6 weeks, we would visit intervention centres two times per week to deliver 2 small group active game sessions (5-8 children for 30 minutes). We are happy to negotiate times that you feel would be minimally disruptive to your centre’s operations. Before each session, each child will be fitted with an activity monitor to record how much they move during each session.

The active games will be age-appropriate experiences developed from our team’s background in early childhood and physical education. The games will challenge pre-schoolers to problem solve and exert control over their thoughts and behaviours, while moving. For example, the activities may target children’s memory (e.g., remembering to only collect the coloured bean-bags they have been allocated), their ability to shift focus (e.g., switching from collecting bean-bags based on their allocated colour to their allocated letter), and control their response (e.g., remembering not to move unless “Simon says”).

In the final week, children would again complete the four iPad games and EEG assessments that were described above, and be asked to wear the activity monitor for one week.

Control centres will be visited to deliver the small group active game sessions for 6 weeks in Term 3, 2018. Educators will be trained to deliver the active game sessions should Centre Management choose for this to occur. We are happy to negotiate times that you feel would be minimally disruptive to your centre’s operations.

Potential risks for children of participating in the active games include minor and acute injuries that sometimes occur when young children play group games that involve movement. Apart from children’s time to complete assessments and parents’ support in assisting children to wear activity monitors at home, we foresee no other risks to participation in this study.

The research has been reviewed by the University of Wollongong’s Human Research Ethics Committee *(Social Science, Humanities and Behavioural Science)*. If there are any ethical concerns you can contact the Ethics Officer, Human Research Ethics Committee, University of Wollongong on (02) 4221 3386 or email rso-ethics@uow.edu.au.

Please find attached, for your review, the Information Sheet and Consent Form that we would like to distribute to eligible children’s parents/caregivers and educators at your centre. The findings of this research can help to identify simple ways for educators and parents to engage and enhance young children’s cognitive development through active games. Further, participating centres will receive a brief summary of the research findings and copies of any publications arising from this study. Should you require any further information please do not hesitate to contact members of the research team.

This study is funded by the Faculty of Social Sciences, University of Wollongong

Yours sincerely,

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| Dr Dylan Cliff  School of Education  dylanc@uow.edu.au  (02) 4221 5929 | Dr Steven Howard  School of Education  stevenh@uow.edu.au  (02) 4221 5165 | A/Prof Stuart Johnstone  School of Psychology  stuart\_johnstone@uow.edu.au  (02) 4221 4495 |

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| Ali Giobbi  School of Education  agiobbi@uow.edu.au | Karen Tonge  School of Education  ktonge@uow.edu.au | Xiaomeng Wei (Kate)  School of Education  xw037@uowmail.edu.au |

**Parent/Caregiver Participant Information Sheet**

Dear Parent/Caregiver:

Your child has been invited to participate in a research project conducted by researchers from the University of Wollongong. The project is entitled: **Active games and cognitive development in pre-school children.**  We are writing to seek your approval to involve your child as a participant in this study.

PURPOSE OF THE RESEARCH

Pre-school children’s cognitive development includes the development of executive functions, which are responsible for formulating goals, planning how to achieve them, and carrying out these plans effectively. Executive functions are strong indicators of school readiness and later academic achievement,and are linked to children’s development and behaviour. Studies in school-aged children suggest that being physically active may support children’s cognitive development. Although children experience rapid improvements in cognitive development and executive functions during the pre-school years, little research has investigated the influence that active play and physical activity may have on young children’s cognitive development. The purpose of this research is to investigate whether participation in active games (i.e., activities that require children to engage both physically through movement and mentally through involving problem-solving and cognitive challenges) influences pre-school children’s cognitive development. If so, this would provide a simple way for educators and parents to engage and enhance young children’s cognitive abilities while also supporting their physical health and development.

INVESTIGATORS

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| Dr Dylan Cliff  School of Education  *dylanc@uow.edu.au*  (02) 4221 5929 | Dr Steven Howard  School of Education  *stevenh@uow.edu.au*  (02) 4221 5165 | A/Prof Stuart Johnstone  School of Psychology  *stuart\_johnstone@uow.edu.au*  (02) 4221 4495 |  |

METHOD AND DEMANDS ON PARTICIPANTS

If you agree for your child to be included in this study, your child will be asked to **complete four**

**iPad-based games to assess their executive functioning**, in a single session of approximately

20-minutes. These games require children to exert control over their thoughts and behaviours to catch fish, sort cards and identify cards that match verbal instructions. These tasks should take no longer than 20 minutes to complete. Children will be asked to wear **an Electroencephalography (EEG)**  **measurement headband** while they are carrying out the Executive Function tests and prior to the tests during a 6-minute resting task. EEG is 100% safe and pain-free. Theheadband will measure brain electrical activity from one location on the forehead. It contains a single, dry sensor that rests gently against the forehead, and an ear-clip sensor. The headband takes 10-30 seconds to fit and is designed for young children. Finally, to understand children’s typical level of physical activity, they will be asked to **wear an activity monitor** (known as an accelerometer) **on their waist using an elastic belt for one week while at the centre and at home.** Children will be asked to wear the monitor during the day and night, but monitors will be removed for water-based activities such as having a bath. The monitor is similar to a pedometer and is small, light and unobtrusive. In addition to this, if you agree for your child to be included in this study, your child will participate in either a small group active game session (5-8 children for 30 minutes), or a group story-time session (15 children for 30 minutes) at their centre, twice per week for 6 weeks. Before each session, each child will be fitted with an activity monitor to record how much they move during each session. If you choose not to allow your child to participate, they will still be welcome to join the activities, but no data will be collected from or about them.

The active games will be age-appropriate experiences developed from our team’s background in early childhood and physical education. The games will challenge pre-schoolers to problem solve and exert control over their thoughts and behaviours, while moving. For example, the activities may target children’s memory (e.g., remembering to only collect the coloured bean-bags they have been allocated), their ability to shift focus (e.g., switching from collecting bean-bags based on their allocated colour to their allocated letter), and control their response (e.g., remembering not to move unless “Simon says”).

The three iPad games, EEG measurement weekly activity monitor measurement will again be administered (as described above) after the 6 weeks of active games to understand if any changes have occurred.

In centres that are control centres the children will participate in active games in Term 3, 2018. Educators will be trained to deliver the active game sessions at the end of the study, should Centre Management choose for this to occur.

POSSIBLE RISKS, INCONVENIENCES AND DISCOMFORTS

Potential risks for children of participating in the active games include minor and acute injuries that sometimes occur when young children play group games that involve movement. Apart from children’s time to complete assessments and parents’ support in assisting children to wear activity monitors at home, we foresee no other risks to participation in this study.

Please note that your child’s involvement in the study is entirely voluntary and you may withdraw your child from the study at any time (this includes withdrawal of any data that has been provided to that point). If your child decides to withdraw from the study during testing, their involvement in the study will be immediately discontinued and any data they have provided to that point will be destroyed. If you would like to withdraw your child’s data from the study at a later date, please contact the Chief Investigator with this request and this data will be destroyed. In either event, declining to participate or withdrawing from the study will not affect your, or your child’s, relationship with the researchers, the University of Wollongong or your child’s preschool centre. Further, all data collected will be kept strictly confidential. You, your child and their preschool centre will not be identified in any part of the research.

FUNDING AND BENEFITS OF THE RESEARCH

This study is funded by the Faculty of Social Sciences, University of Wollongong. The findings of this research can help to identify simple ways for educators and parents to engage and enhance young children’s cognitive abilities while also supporting their physical health and development. As such, findings from the study may be published in research journals and presented at research conferences. However, at all times confidentiality will be assured, and you, your child and their preschool will not be identified in the reporting of this research.

ETHICS REVIEW AND COMPLAINTS

This study has been reviewed by the Human Research Ethics Committee (Social Science, Humanities and Behavioural Science) of the University of Wollongong. If you have any concerns or complaints regarding the way the research is or has been conducted, you can contact the Ethics Officer on (02) 4221 3386 or e-mail [rso-ethics@uow.edu.au](mailto:rso-ethics@uow.edu.au).

Thank you for your time and interest in this study.

Yours sincerely,

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| Dr Dylan Cliff  School of Education  *dylanc@uow.edu.au*  (02) 4221 5929 | Dr Steven Howard  School of Education  *stevenh@uow.edu.au*  (02) 4221 5165 | A/Prof Stuart Johnstone  School of Psychology  *stuart\_johnstone@uow.edu.au*  (02) 4221 4495 |

**Parent/Caregiver Consent Form**

**Research Title:** Active games and cognitive development in pre-school children.

**Researchers:**

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| Dr Dylan Cliff  School of Education  *dylanc@uow.edu.au*  (02) 4221 5929 | Dr Steven Howard  School of Education  *stevenh@uow.edu.au*  (02) 4221 5165 | A/Prof Stuart Johnstone  School of Psychology  *stuart\_johnstone@uow.edu.au*  (02) 4221 4495 |  |

I have read the Letter of Information to Parents/Caregivers and have had an opportunity to ask the researchers any further questions I may have. I understand that my child’s participation in this study is voluntary and I, or they, may decline to participate or withdraw from the study at any time (as well as any data provided to that point) without affecting my or my child’s relationship with the researchers, the University of Wollongong or their preschool centre.

I understand that the risks to my child from participation in the active game session include minor and acute injuries that sometimes occur when young children play group games involving movement. I have read the information sheet and asked any questions I have about the risks. I understand that my child will be asked to complete four iPad-based measures of executive functioning in a single session of approximately 20-minutes. In addition to this, my child will be read an Australian animal-based story three times a week (either individually or in a group) for 8 weeks. After that, they will again complete the three iPad-based measures of executive functioning to see if there has been any change. I understand that all information collected will be anonymous, will be kept strictly confidential and that my child will not be identified in any part of the research.

If I have any concerns or complaints regarding the way the research is or has been conducted I can contact the Ethics Officer, Human Research Ethics Committee, Office of Research, University of Wollongong on (02) 4221 3386 or email rso-ethics@uow.edu.au.

I understand that this study may result in publication in a peer-reviewed educational journal, in order to disseminate important findings to the wider educational community. However, data will not be reported for individual participants and no individual identifying information will be reported.

By signing below I am consenting to:

1. My child participating in two testing sessions of approximately 26-minutes, in which they will be asked to play four iPad-based games involving executive functions and wear an EEG head-band during the games and a resting activity; and,
2. My child participating in either a small group active game session, at their centre, for 30 minutes, twice per week for 6 weeks, while wearing an activity monitor; and,
3. My child wearing an activity monitor for one week at the start and one week at the end of the study, including at home and at the centre.

I give permission for my child \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to participate in this research (please print child’s name)

Parent/ Guardian Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Parent/Caregiver Name: (please print) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Phone Number:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Email:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Child’s Date of Birth: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Child’s Gender: \_\_\_\_\_\_\_\_\_

Address:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Postcode: \_\_\_\_\_\_\_\_\_\_\_\_

Child’s Attendance: Monday Tuesday Wednesday Thursday Friday

(please circle)

**Please return this form to your child’s teacher. Thank you.**