

Spring 6-1-2019

Influences on Early Creativity: Examining the Role of Affect, Movement and Autonomy During Play on Divergent Thinking Skills of Preschool Children

Taylor S. Boyd

Huron University College, Western University, tboyd22@uwo.ca

Follow this and additional works at: https://ir.lib.uwo.ca/psych_uht



Part of the [Psychology Commons](#)

Citation of this paper:

Boyd, Taylor S., "Influences on Early Creativity: Examining the Role of Affect, Movement and Autonomy During Play on Divergent Thinking Skills of Preschool Children" (2019). *Undergraduate Honours Theses*. 39.

https://ir.lib.uwo.ca/psych_uht/39

INFLUENCES ON EARLY CREATIVITY: EXAMINING THE ROLE OF AFFECT,
MOVEMENT AND AUTONOMY DURING PLAY ON DIVERGENT THINKING SKILLS
OF PRESCHOOL CHILDREN

by

Taylor Boyd

Department of Psychology

Submitted in Partial Fulfillment
of the requirements for the degree of
Bachelor of Arts
in
Honours Psychology

Faculty of Arts and Social Science

Huron University College

London, Canada

April 22, 2019

© Taylor Boyd, 2019

HURON UNIVERSITY COLLEGE
CERTIFICATE OF EXAMINATION

Advisor: Dr. Christine Tsang

Reader: Dr. Irene Cheung

The thesis by:

Taylor Boyd

entitled:

Influences On Early Creativity: Examining The Role Of Affect, Movement And Autonomy
During Play On Divergent Thinking Skills Of Preschool Children

is accepted in partial fulfilment of the requirements for the degree of

Bachelor of Arts

in

Honours Psychology

April 22, 2019

Date

Dr. Christine Tsang

Chair of Department

Abstract

Play provides children an opportunity to practice cognitive and affective processes which are important in creativity. Studies have found that during play, children who display positive emotions, are physically active and play by themselves tend to demonstrate higher creativity. In the present study, the researcher observed fifteen preschool children to record their independence, affect and physical movement during free play. In addition, one adult from each classroom rated of each child's general affect. Next, participants completed two versions of an Alternate Uses Task assessing divergent thinking skills: one standard version in which participants verbally indicated multiple uses for an object presented by the researcher, and one embodied version in which they could physically manipulate the object while they generated their responses. Results indicated preschoolers provided a significantly greater number of responses on the embodied Alternate Uses Task ($M = 3.64, SD = 2.34$) than on the standard Alternate Uses Task ($M = 2.45, SD = 1.81$), $t(10) = -.67, p = .05, d = -.69$. Furthermore, children's general positive affect as rated by their ECE was a significant predictor of children's fluency scores on the Alternate Uses Task, $\beta = .60, t(10) = 2.26, p = .05$, and accounted for 36% ($R^2 = .36$) of the variance in fluency scores. These results indicate that physical movement during a creative thinking task and general positive happiness facilitates a greater number of responses. Results are discussed in the context of the classroom.

Acknowledgements

I am indebted to the director of University Child Care, Tracy Martin, and the director of East London YMCA Child Care, Lesley Hutton, for their support of my observation sessions in their classrooms. I am indebted to my thesis advisor Dr. Christine Tsang for her efforts in arranging these observation sessions and her unwavering support in the many stages of my thesis report as well as my earlier projects in developmental psychology under her supervision which were instrumental in inspiring my current thesis project. Furthermore, I would like to thank my second reader Dr. Irene Cheung for her continued feedback on my thesis which prompted me to reexamine and refine the study design and results analysis. Without the support of these individuals, the current project would not have been possible.

Table of Contents

	Page
CERTIFICATE OF EXAMINATION	ii
Abstract	iii
Acknowledgements.....	iv
Table of Contents	v
Introduction	1
Method	7
Participants	7
Materials	8
Procedure	10
Results	12
Discussion	13
References	22
Appendix I	25
Appendix II	26
Appendix III	27
CurriculumVitae	29

Introduction

“Every child has the right to rest and leisure, to engage in play and recreational activities appropriate to the age of the child and to participate freely in cultural life and the arts.”

- United Nations Convention on the Rights of the Child, Article 31

Play is universally recognized as a process that is central to child development.

Described by Vygotsky (2004) as the “root of all creativity in children”, playing is considered a natural form of learning in young children which encourages the growth of capacities such as curiosity that are a source of an endless variety of ideas which constitutes creativity. While creativity has flourished as a subject of psychology theory and research for many decades, it is only more recently gaining traction in education. As children enter their first formal learning environment of a preschool classroom, the natural processes of exploration and experimentation through which they have learned about the world up until this point are the foundation of their classroom learning and play. Play is considered “a vehicle for learning” which “rests at the core of innovation and creativity” and integrates the processes of learning and doing according to the Ontario Ministry of Education (2016). Furthermore, the Council of Ministers of Education, Canada (CMEC) states that “ministers of education endorse a sustainable pedagogy for the future that does not separate play from learning but brings them together to promote creativity in future generations” (Ontario Ministry of Education, 2016). While the integration of play and learning to yield creativity prioritized by educators is grounded in theory, this area of research deserves further exploration in experimental psychology. The present study aims to examine how play in the classroom during the earliest stages of development can predict the creative thinking abilities of preschoolers.

Play Versus Instruction

In contrast to learning through explicit instruction which involves the teacher as the primary source of knowledge, children are the directors of their own learning during play. The

learning objectives of play are undefined and often unknown by the child themselves (Vygotsky, 2004), and children are responsible for discovering how to acquire new knowledge. Compared to a traditional learning setting in which instructors transmit curricular knowledge to their students, in play there is no mediator between the child and their environment. Thus, curiosity and imagination must be the driving processes for learning which creates the opportunity to develop a broader range of cognitive and emotional outcomes. Vygotsky (1978) distinguishes the play Zone of Proximal Development (ZPD) from learning-instruction ZPD, stating that compared to learning through instruction,

play provides a much wider background for changes in needs and consciousness. Action in the imaginative sphere, in an imaginary situation, the creation of voluntary intentions, and the formation of real-life plans and volitional motives – all appear in play and make it the highest level of preschool development (p. 102-103) (as cited by Connery, John-Steiner, & Marjanovic-Shane, 2018, p. 35)

According to Russ (2004), pretend play may be instrumental in helping children become more creative because it involves a variety of cognitive processes such as making associations, using symbols, and manipulating object representations, as well as affective processes which are involved in divergent thinking. This measure of creativity “can be operationalized as the ability to generate numerous and diverse ideas” (Runco, 1991, p. 138). The development of divergent thinking tasks are perhaps the most commonly used measures to predict potential for creative thinking (Runco, 1991, p. ix) and are used extensively in research on play and creativity. Since abstract concepts such as creativity are difficult to operationalize in the classroom, these measures allow for the examination of creativity as a measurable outcome which are “not synonymous with creative thinking” (Runco, 1991, p. ix) but yield scores that are predictive of creative abilities.

Solitary Play and Divergent Thinking

Educators have endorsed the conceptualization of learning as an inherently social process in which children experience development on the social level before being internalized by the individual (Vygotsky, 1978, p. 57) (as cited by Connery, John-Steiner, & Marjanovic-Shane, 2018, p. 29). And yet findings from Lloyd and Howe (2003) illustrate the creative benefits of solitary play. Their results suggest that playing by oneself is associated with improved divergent thinking skills because children are more likely to use close-ended materials in non-intended ways when playing alone compared to in a group. Close-ended materials are intended to be used in only one way and generally encourage convergent thinking, which generally requires one answer in response to a cue, compared to open-ended materials which can be used in multiple ways and encourage divergent thinking.

These authors found that children who engage in solitary-active play, which includes participating in make-believe (solitary-dramatic play) or displaying repetitive movements with or without a toy (solitary-functional play), tend to have better divergent thinking skills, use materials in non-intended ways and display higher imagination scores than their peers who engaged in solitary-passive play, which involves manipulation of objects with the aim of creating or learning about the object's properties, and who played in a group setting scored lower on these measures. The authors interpreted this relationship as indicating that solitary play is an opportunity to facilitate divergent thinking skills in children. It is also relevant to consider findings by Ooi, Baldwin, Coplan and Rose-Krasnor (2018) that a preference for solitary play is associated with asocial behaviour, which is related to peer exclusion. Peer exclusion negatively influences one's affect which could reduce creative performance. Thus, further exploration could reveal the competing influences of task enjoyability compared to the cognitive benefits that may arise from solitary play.

Play, Affect and Movement

Play is an effective way for children to learn because it is an enjoyable activity. The extent to which children are happy and engaged during a task could contribute to their motivation and cognitive processes. Play is an instrumental factor particularly in developing the expression and experiencing of positive affect, which helps develop the ability to access memories, and the ability to modulate affect (Ooi, Baldwin, Coplan & Rose-Krasnor, 2018). Kaugars and Russ (2009) found that children who expressed more emotions in their play demonstrated higher enjoyment and task involvement, demonstrated more pretend play, and provided more responses and more original responses on divergent thinking as measured by the Multidimensional Stimulus Fluency Measure (MSFM). Furthermore, these researchers found that teacher ratings of how intensely children experienced positive and negative emotions on a daily basis were associated with these children displaying variety of affect expression, comfort, and pretense in play. Children who expressed a variety of types of affect in their play, were comfortable playing, and engaged in pretend play were rated as demonstrating more intense positive emotions in their daily behavior. These results suggest that children's affect in play reflects their general affect. An area of further investigation is whether their dispositional affect is a better predictor of their creative thinking abilities than affect observed during play.

Play allows children to be active learners not only by allowing them to take control of their own learning, but also gives them freedom to physically explore their environments and embody their exploration processes. Movement contributes to learning in play through affect; unsurprisingly, when children are allowed more freedom of movement, they score higher on a range of emotional outcomes including happiness and confidence. Cheung (2010) found that in movement activities, children were happy, engaged, and more confident when responding to teachers' questions and when giving new ideas. Furthermore, teachers reported an increase in students "creative motivation" after participating in the creative movement activity. Similarly,

Lobo and Winsler (2006) observed that an eight-week dance program yielded benefits for children which included increased self-esteem and confidence in expressing themselves through movement. Additionally, participants took more risks, possibly because they perceived the class as a safe environment in which to try new things.

Several studies have shown that the effect of movement on creativity persists beyond the influence of affect. Scibinetti, Tocci and Pesce (2011) identified moderate correlations in school-aged children between fluency (the total number of items generated) and flexibility (the number of different categories in responses) scores on the Divergent Movement Ability Test and Torrance Test of Creative Thinking (TTCT), which indicates commonality between creative thinking and motor creativity. Fluency in creative thinking was found to be a predictor of all three dimensions of motor creativity, suggesting that generating many thoughts is a “fundamental prerequisite” for creativity in movement. Furthermore, Trevlas, Matsoukas and Zachopoulou (2003) found that preschool children’s playfulness as rated by their teacher was significantly correlated with their fluency and flexibility on the Divergent Movement Ability Test (Cleland & Gallahue, 1993). These authors cited their findings as support for Cleland’s (1994) argument that divergent movement is the product of creative and critical thinking and McBride’s (1992) theory in which fluency and flexibility in motor responses reflect one’s ability to generate and elaborate on many ideas produced from previous experiences. Thus, children’s prior motor experience and cognitive elaboration on their ideas may provide the basis for the relationship between movement and creativity.

In their study on movement and creativity university students, Slepian and Ambady (2012) identified a similar relationship between creative thought and action. They found that fluid movement while tracing a drawing enhanced creativity as measured by performance on alternate uses, category inclusiveness and concept association tasks. The research showed that

student affect and mental performance were not influenced by fluid movement, which reveals the differential effect of creativity on cognitive processing.

In the present study, the researcher aims to investigate the relationship between play, movement and creativity. While the studies reviewed examine pretend play which is defined as that which involves fantasy, make-believe, and symbolic object use (Fehr & Russ, 2016), play in the present study is operationalized as any activity participants perform during their designated free time which is not directed by their Early Childhood Educators (ECE). Although Lloyd and Howe (2003) found differential effects of solitary-active and -passive play on cognitive activity, the current research is focused on comparing children's learning processes in relation to their peers and their play materials. Thus, group play will be distinguished from solitary play but no distinctions within the latter category will be made. Based on the findings of Lloyd and Howe (2003), it is predicted that solitary play will be an opportunity for children to practice imagining uses of objects which will translate into a greater number of uses and more original uses of objects on divergent thinking tasks.

In addition, the influence of affect and movement on creative thinking will be explored. The researcher seeks to determine whether solitary play is associated with lower levels of positive affect which could translate to lower creative output. Furthermore, the present research will explore whether the process of embodied metaphor, in which fluid movement appears to cue a similarly fluid thought process which enhances creative output, is observed in preschoolers despite their lower level of cognitive development compared to university students in whom this relationship was observed. It is expected that a similar enhancement of fluid thinking as a result of fluid movement will be observed as demonstrated by improved performance on an embodied versus standard divergent thinking task.

Based on research reviewed, the following hypotheses are proposed:

- 1) Participants will earn a higher score on the embodied divergent thinking task compared to the standard divergent thinking task;
- 2) Increased positive affect during play will predict a higher score on both divergent thinking tasks;
- 3) Higher levels of motor movement during play will predict a better score on the embodied than the standard divergent thinking task;
- 4) Playing alone will be related to better performance across both divergent thinking tasks compared to playing in a group.

Method

Participants

Five girls and ten boys from preschool classrooms in two daycare centres in London, Ontario participated in the present study. The age of children ranged from approximately two to three years old. Participants were selected based on written consent obtained from their parents in addition to assent indicated to the researcher by participants themselves. Participants were otherwise not selected based on any characteristics. Behavioural observations were recorded for all participants, but four children did not want to participate in the creativity tests, yielding a total of three girls and eight boys who completed these tests.

Materials

Affect in Play-Preschool Scale

Play measures in the present study were adapted from the variety and frequency subscales of the Affect in Play-Preschool Scale (APS-P) (Kaugars & Russ, 2009). Categories of the original scale were grouped into positive affect, including happiness/pleasure and nurturance/affection; negative affect, including aggression, anxiety/fear, sadness/hurt, and frustration/disappointment/dislike; and a category for undefined affect. Participants in the

present study were scored with either an “P” for positive affect, “N” for negative affect, and “A” for ambiguous affect.

The consistent pattern of medium to large effect sizes for correlations between child displays of affect and teacher play ratings found by Kaugars and Russ (2009) were interpreted as supporting preliminary face validity for this measure. Furthermore, this measure demonstrated high interrater reliability, with correlations for primary ASP-P scores and play categories all above .90, as well as high internal consistency, as measured by the Spearman-Brown split-half reliability formula ($r = .88$). Furthermore, Fehr and Russ (2016) identified acceptable construct validity, external validity and reliability of this measure.

Positive and Negative Affect Schedule for Children – Parent Version (PANAS-C-P)

The abbreviated Positive and Negative Affect Schedule for Children – Parent Version (PANAS-C-P) (Ebesutani et al., 2012) was used as a secondary and dispositional measure of affect in addition to the APS-P. The original parent scales demonstrated good convergent validity with the Negative Affect (NA) and Positive Affect (PA) scales of the original scales, as well as high internal consistency. Ebesutani et al. (2012) found that for the shortened 5-item PA scale and original 12-item PA scale of the PANAS-C-P, Cronbach’s alpha coefficients were .85 and .88, respectively. Cronbach’s alpha coefficients for the reduced 5-item NA scale and original 15-item NA scale of the PANAS-C-P were .83 and .93, respectively. In the present study, ECE’s completed these rating scales to provide evaluations of children’s general affect instead of parents. As ECE’s spent a significant amount of time per weekday with participants, they were deemed appropriate evaluators of children’s general affect.

Alternate Uses Tasks

The task used to measure divergent thinking was the Alternate Uses Task by Wallach and Kogan (1965). While the task script was devised and executed by the researcher, the basic format and purpose of the task were followed closely. Following the procedure of Hoffman and

Russ (2012), participants were presented with familiar objects for which they were asked to generate multiple uses. Responses for both tasks were assessed for fluency, which were defined as the number of acceptable answers. For the present study, rather than deeming answers describing practical uses of objects, those which described any manipulation of the object were deemed acceptable in order to accommodate the younger age sample. This approach was taken as the divergent thinking task was originally developed for older children with more mature cognitive abilities compared to preschool children. Responses were also assessed for originality, which is traditionally defined as the number of answers given by less than 1% of respondents but for the present study which involves a small sample size, those answers which were given solely by the participant were considered original. As in Hoffman and Russ's (2012) study on young children, responses in the present study were not scored for flexibility, or the number of different uses generated by the participant, due to the young age of the sample. The researcher in the present study used Wallach and Kogan's (1965) method of uniqueness scoring due to its benefits as described by Silvia et al. (2008). The assignment of either a 0 or 1 is more straightforward compared to other methods which involve steps such as calculating frequencies. As well, interpretation of scores is quite simple: creativity is essentially equated with originality.

In addition to the standard Alternate Uses Task by Wallach and Kogan (1965), an embodied version of this task was administered which allowed the participant to physically manipulate the objects for which they are generating uses. In the task script, the instructions were modified from "Can you please *tell me* the different ways to use [an item]" for the standard Alternate Uses Task to "Can you please *tell me and show me* the different ways to use [an item]" for the embodied Alternate Uses Task.

Although psychometric properties were unavailable for the embodied version of this task, the standard Alternate Uses Task demonstrates acceptable validity. In his comparison of the reliability of various divergent thinking tasks, including the unusual uses task (a variation of

the Alternate Uses Task), instances task, and consequences task, Silvia (2011) found that the unusual uses task had the highest reliability level and was deemed appropriate for basic research based on its performance in a confirmatory factor analysis (CFA). Furthermore, Mouchiroud and Lubart (2001) found Cronbach's alpha scored above .80 for judges' ratings of originality and creativity of the Alternate Uses Task. Thus, the Alternate Uses Task was selected to be used in the present study based on its acceptable psychometric properties and widespread usage to measure divergent thinking.

Procedure

Before the researcher began classroom observations, written consent was obtained from parents and assent was acquired from the daycare centre director and ECE's. In the first stage of the study, the researcher observed preschoolers during their free play periods in the classroom from a secluded area of the classroom over the course of two five-minute observation sessions for a total of ten minutes per child. Only play behaviour which occurred outside of structured play activities led by daycare staff was recorded; participation in structured activities which occurred even during free play period were not recorded. During each observation session, components of play behaviour were recorded every ten seconds for a total of thirty recordings over five minutes. Momentary time sampling (MTS) was the selected method of observation recording in the present study, in which the researcher recorded the occurrence or non-occurrence of the target behaviour at the end of each 10-second interval (Cooper et al., 2007 as cited by Lane and Ledford, 2014). During the first session, participants' movement ("A" = active play, "S" = sedentary play) and sociability ("G" = group play, "S" = solitary play) were recorded. Active play was considered play which involved significant limb movement and group play was defined as any play during which the participant was not only in close proximity to their peers or ECE but also interacting with them. Participants' affect ("P" = positive affect,

“N” = negative affect, “A” = ambiguous affect) was recorded during the second observation session.

In the second stage of the study, the researcher approached participants to acquire their assent to complete two versions of the Alternate Uses Task measuring divergent thinking. In these tasks, participants were required to think of different uses for objects in their classroom. Objects selected for use in the task included toys such as elastics, strings, pipe cleaners and flexible plastic sticks. As these objects were part of participants' regular set of play materials readily accessible in the classroom from the main play area on the carpet, participants were already familiar with these objects which made them eligible for use in the divergent thinking tasks. In addition, these objects were selected for their ability to be easily manipulated. This was deemed an important feature by the researcher in maximizing the ability for preschoolers to generate multiple uses for objects.

In a within-subjects design, all participants were invited to complete both the standard version the embodied version of the Alternate Uses Task. The order in which participants completed these tasks was randomly assigned; after the participant had completed one version of the task, they were asked to complete the remaining task at either at a later point during the same session or during a subsequent session. For the standard Alternate Uses Task, participants were invited to play a game with the researcher at a table away from the primary play area of the classroom. If the child agreed to participate, they were shown an object from the set of toys surrounding the play area and asked by the researcher to say the different ways in which the object could be used. The researcher demonstrated uses of the toy which the child suggested. In the embodied version of the Alternate Uses Task, participants received the same instructions except they were permitted to touch and interact with the object during the generation of their responses.

In order to examine personality as a potential confound in the relationship between movement and creativity, one ECE from each classroom completed affect ratings for each preschooler participant on the abbreviated PANAS-C-P (Ebesutani et al., 2012). These responses were correlated with frequency affect scores recorded during observations of free play; both a measure of temperament and a behavioural outcome of affect were taken to improve the validity of the measure.

Results

Fluency and originality scores on the Alternate Uses Tasks were compared using a dependent-samples *t*-test. Significantly higher scores for both categories on the embodied task were expected compared to the standard task. Analysis revealed that preschoolers provided a significantly greater number of responses on the embodied Alternate Uses Task ($M = 3.64$, $SD = 2.34$) than on the standard Alternate Uses Task ($M = 2.45$, $SD = 1.81$), $t(10) = -.67$, $p = .05$, $d = -.69$. However, preschoolers did not provide significantly more original responses on the embodied divergent thinking task than on the standard divergent thinking task.

Simple regressions were run predicting originality and fluency scores on standard and embodied Alternate Uses Tasks from frequency of solitary and active play as observed by the researcher. Results revealed a non-significant positive relationship between movement during play and creative thinking. Furthermore, simple and multiple regressions were run predicting originality and fluency scores on standard and embodied Alternate Uses Tasks from frequency of positive, negative and ambiguous affect observed by the researcher. Analyses revealed no significant relationship between affect during play and scores on either version of the Alternate Uses Task, although results trended in the predicted direction.

Similarly, simple regression analyses predicting originality and fluency scores on standard and embodied Alternate Uses Tasks from ECE ratings of positive and negative affect revealed that in general, the ability of ECE affect ratings to predict divergent thinking skills did

not reach significance although trended in the predicted positive direction. The only variable which was a significant predictor of creative thinking was ECE-rated positive affect. A regression analysis was conducted with fluency scores on the standard Alternate Uses Task as the criterion variable and PANAS-C-P scores for positive affect as the predictor. PANAS-C-P positive affect scores was a significant predictor of fluency scores on the standard Alternate Uses Task, $\beta = .60$, $t(10) = 2.26$, $p = .05$, and accounted for 36% ($R^2 = .36$) of the variance in fluency scores.

Discussion

The goal of the present study was to explore the influence of preschoolers' affect and behaviour during play on their creative thinking abilities as measured by their performance on divergent thinking tasks. Statistical analyses revealed partial support for Hypothesis 1 that children would generate a greater number of responses on the embodied Alternate Uses Task than the standard version of this task. Although children generated a greater number of responses on the embodied Alternate Uses Task, they did not generate more original responses compared to the standard Alternate Uses Task. Thus, physically performing alternate uses appears to allow preschoolers to generate more but not necessarily more unique responses on a divergent thinking task. These results partially support findings that performance on movement and verbal measures of creativity are correlated (Scibinetti, Tocci & Pesce, 2011) and that movement during a creative task enhances task performance (Slepian & Ambady, 2012).

The result that improved fluency but not originality scores were observed during the embodied Alternate Uses Task as compared to the standard task may indicate that physical manipulation and experimentation allows for a greater output of responses to a cue by the researcher. Thus, potentially more ideas are generated when children are given room to experiment, but these ideas are not necessarily more original than those which are solely cognitively generated. Past studies yield mixed results which partially corroborate the present

findings. For example, Hoffman and Russ (2016) identified only slightly improved fluency and originality scores in response to a play intervention which involved practice creating stories and acting them out with toys. As the improvements in divergent thinking were minimal compared to those observed in the children's pretend play, these authors suggested that perhaps children's improvements in play do not generalize to divergent thinking skills, despite the strong relationship established between these activities in the literature (e.g. Russ, 2004). The lack of a relationship between characteristics of play and divergent thinking abilities in the present study support a possible discrepancy in development between these two domains. Further research should consider differences in evaluation such as the influence of testing on the responses generated for the Alternate Uses Task as well as whether the common mechanisms between play and creative thinking are visible in observed play or require testing to reveal.

The finding that fluency scores on the standard alternate uses task was predicted solely by ECE-rated positive affect suggests that preschoolers' general temperament may be a better predictor of their creative performance than their affect displayed during free play. These results partially support Hypothesis 2 that positive affect during play would be positively related to improved performance on divergent thinking tasks. ECE-rated positive affect was found to significantly predict the number of responses participants generated on the standard alternate uses task. This finding suggests that participants who are generally happier tend to think of more uses for a familiar object. Assuming that ECE ratings of children's affect are a reliable indicator of children's temperament, this finding suggests that children's general affect is a more effective predictor of their creative thinking abilities than their affect displayed during free play, beyond potential methodological problems with single-researcher data collection. These results corroborate findings by Hoffman and Russ (2016) that baseline positive affect was significantly positively correlated with fluency in divergent thinking as measured by the Alternate Uses Task and by a storytelling activity. Similarly, Kaugars and Russ (2009) found that teacher ratings of

how intensely children experienced positive and negative emotions on a daily basis were associated with these children displaying variety of affect expression, comfort, and pretense in play. Children who expressed a variety of types of affect in their play, were comfortable playing, and engaged in pretend play were rated as demonstrating more intense positive emotions in their daily behavior.

Alternatively, the affect measure used in the present study may not have been reliable. Although past studies have supported teacher ratings as reliable measures of play variables and affect, the PANAS-C-P was originally intended for parent use and teacher ratings on this measure have not been tested for reliability or validity. There was a notably narrow range of positive and negative affect ratings by ECE's across participants which may have indicated either that the scale was not sensitive enough.

While movement during the divergent thinking task was related to improved creative thinking performance, movement observed during children's free play was not related to their performance on either version of the Alternate Uses Task. This finding does not support Hypothesis 3 that children who are more active during play will score better on the embodied than the standard divergent thinking task and suggests the degree to which children move around while they play does not affect their divergent thinking skills. On the other hand, children's general level of physical activity may be more reflective of their motor experience than the movement observed in their free play intervals. Unlike affect which was measured both by researcher observations and ECE ratings, a general measure of children's motor affect was not taken in the present study. Although baseline verbal ability has been found to be unrelated to performance on verbal divergent thinking tasks in elementary school students (Runco & Pezdek, 1984), there is evidence suggesting that previous motor experience is significantly related to divergent thinking (Cleland & Gallahue, 1993) (as cited by Zachopoulou et al., 2003). Thus, it is possible that children who participate in more physical activities on a regular basis scored

higher on the embodied version of the Alternate Uses Task. An additional implication of the influence of motor experience is that older children tend to score better on motor divergent thinking scores than their younger peers (Cleland and Gallahue, 1993) (as cited by Zachopoulou et al., 2003). This finding also raises the possibility that age differences within the present sample may have yielded a difference in scores on the embodied Alternate Uses Task.

The methodology selected for the study may have contributed to obscuring a significant relationship between researcher recordings of movement and affect and divergent thinking performance; it is possible that the researcher did not capture participants' typical displays of movement in the samples of their play behaviour the researcher observed. One of the disadvantages of using MTS as an observation technique is that occurrences of the target behaviour during each interval is not recorded; only those behaviours which occur at the end of the interval are counted. Perhaps recording the frequency of each display of the target behaviour would have provided a more accurate reflection of the children's affect and behavioural patterns. In addition, several observers could achieve more rigorous data collection and comparison of their results for interrater reliability would address reliability issues of single-researcher data collection and improve the validity of the behavioural measure of affect.

Finally, Hypothesis 4 that playing alone will be related to better performance across both divergent thinking tasks compared to playing in groups was not supported. In addition to examining solitary play, Lloyd and Howe (2003) examined parallel play, in which a child plays independently but among others and using similar toys, and group play, in which a child plays with others with a common purpose. For the present study, parallel play was recorded as solitary play because the distinguishing feature between solitary and group play was operationalized as the interaction between participants. Furthermore, the author of the present study did not distinguish solitary-passive play from solitary-active play; solitary and active play were recorded as categorical variables. It is possible that practice using materials in non-intended

ways acts as direct practice for performance on Alternate Uses Tasks. Thus, examining use of toys during play in future research may provide more insight as to the potential influence of practice effects depending on the modality of creative thinking assessed (i.e. verbal vs. physical) and which components of play contribute to cognitive processes which may underlie play and creative thinking processes.

Limitations

The most significant limitation of the present study was a small sample size. Reduced participation for the divergent thinking tasks resulted in an even smaller sample for statistical analyses and thus lower power of results, which ultimately also limits the generalizability of findings. A larger sample of preschoolers not only may reveal more significant relationships between features of play and creative thinking, but also allow for a more detailed examination of individual differences on creativity. For example, although participant age was not measured in the present study, significant differences have been identified in cognitive abilities between children even one year apart. Four-year-old children have been found to display significantly better executive functioning (EF) abilities and demonstrated learning across trials of EF tasks compared to three-year-old children (Carlson, Davis & Leach, 2005). As cognitive abilities are a significant component of divergent thinking, it is plausible that this pattern observed in EF applies to creative thinking. J.P. Guilford (1967) suggested that in divergent thinking tasks, “there is relatively more transfer recall in these fluency-test tasks and less of the direct, replicative type of recall” (p. 310). Thus, further research should investigate how even minor age differences between participants may result in different levels of recall and transfer recall abilities that yield improved divergent thinking performance in older children compared to their younger peers. Controlling for cognitive ability by administering basic cognitive tests such as working memory tasks could also mitigate potential confounding effects of cognitive ability.

Two important features of play which were not examined in the present study include children's fantasy and use of objects. Lloyd and Howe (2003) found that children who played alone tended to use their toys more creatively than when playing passively and playing among peers, regardless of whether children interacted with their peers. Recording even the frequency of toy use during play may have provided a useful predictor of divergent thinking abilities. Such a relationship may indicate whether using toys during play allows children to practice and imagine uses for toys which facilitates transfer recall and/or generation of multiple answer on a divergent thinking task.

Furthermore, play in the present study was defined in very broad terms compared to most research on play and creativity reviewed in this paper which examine specifically pretend play. The task was modified for a preschool population by applying a broader definition of alternate uses to accommodate developmental and cognitive differences in a younger population. This research may be useful in elucidating the need for a developmentally appropriate creativity task for a preschool population. The broader definition of alternate uses to include manipulations which do not necessarily constitute a "use" in real life meant that participants' standard of usefulness was personal. A potential implication of this operationalization is that preschoolers lacked awareness of "usual" uses for objects which may have meant that responses reflecting deviation from these norms which constitutes the traditional definition of originality for the Alternate Uses Task may have instead reflected individual differences in experiences or chance differences in object manipulations.

While divergent thinking tasks such as Thinking Creatively in Action and Movement Test (TCAM) (Torrance, 1981; Lloyd & Howe, 2003) and storytelling tasks (Fehr & Russ, 2016) have been administered in children as young as four years of age, the Alternate Uses Task which was used in the present study has been administered in children only as young as five years old (Hoffman & Russ, 2016) and is not extensively used with preschoolers. Children in

the present study were younger than samples of even these studies; current participants ranged between two to three years of age, whereas the range for most studies examining divergent thinking in preschoolers is between three to 6 years of age. Research such as findings of EF differences which result from a mere one-year difference between participants suggest participant age in future research should be held constant in order to control for potential effects of differences in cognitive maturity on creative thinking.

The uniqueness scoring method used in the present study has been criticized for confounding creativity with fluency. Silvia (2008) and Silvia et al. (2011) identified a significant positive relationship between fluency and uniqueness scores, which was interpreted as evidence that uniqueness scoring confounds fluency and originality scores. In addition, Silvia et al. (2011) report a similarly high correlation between these dimensions reported by Torrance (2008) on the Torrance Tests of Creative Thinking. While the finding in the present study that movement during the Alternate Uses Task was related to improved fluency but not originality scores suggests that these two dimensions of the divergent thinking task were distinct, a Pearson r bivariate correlation revealed a significant positive correlation between originality and fluency scores on the standard alternate uses task, $r(9) = .91, p = .00$, as well as on the embodied alternate uses task, $r(9) = .75, p = .01$, which suggests that uniqueness scoring confounds originality scores with fluency scores (Silvia et al., 2011). Silvia et al. (2011) noted that this confounding is perhaps inevitable since as children provide more responses, the likelihood of generating a unique response naturally improves as well. Although the present researcher attempted to limit the effect of multitude of responses on originality by setting a short time limit on Alternate Uses Task, this pattern of significantly related dependent variables appears to be a symptom of creativity tests which plagues multiple studies.

Future Directions

It is critical for researchers to reassess the purpose and value of using divergent thinking tasks to assess creative thinking in preschoolers. While measures of preschooler creativity should be designed to reflect the unique learning styles of this developmental period, researchers should also consider examining how creative thinking at a young age predicts performance in later years, not only in creativity but also other measures of intelligence. Divergent thinking tests consistently score acceptably on psychometric tests yet there still exist some mixed reports indicating a lack of discriminant validity (Runco, 1991, p. 159) and limited long-term predictive validity for children (Kogan and Pankove, 1972, 1974). In addition, the predictive ability of divergent thinking has been found to be largely domain-specific (Runco, 1991). The lack of a creativity measure with predictive validity and generalizability may raise the question of whether creativity is specific to a discrete developmental period and domain.

Originality is considered a valuable feature of creativity because creativity in adults is generally measured as works which contributes significantly greater insight to one's field than the creator's peers. While creativity was largely equated with originality in the present study on the Alternate Uses Task, it is important to consider whether this was an appropriate judgment for the age sample. Preschoolers have not yet entered the formal classroom environment and thus have not yet experienced conforming their behaviour to meet external evaluation criteria. Especially in play, those ideas which are the most valuable to preschoolers and their peers may not necessarily those which adults judge to be creative.

Creativity research in preschoolers is of critical importance because there is currently a shift of focus from academic subject matter towards the development of 'soft skills' not only within the classroom but also in the workplace. The Six C's of Deep Learning are a set of learning competencies which were created as part of the New Pedagogies for Deep Learning initiative to guide student development of interpersonal skills demanded by modern workplaces (Fullan & Scott, 2014). Recently, Ontario made important strides in developing these

competencies within schools: the proposed changes to elementary report cards to include “transferable skills” include several of these skills, such as creativity, and character (Rushowy, 2017). The present study responds to these developments in policy and classroom practice by investigating the role of play in developing the competency of creativity, which is desired by employers as a “21st Century Competency” and prioritized as a learning objective in the classroom (Fullan & Scott, 2014; Ontario Ministry of Education, 2013) The present study aimed to investigate this holistic view of education from its roots in the preschool classroom. Future research should continue to contribute to informing the practice of pedagogical reflection and elucidate the role of the educator in how to prepare the classroom environment and activities to optimize learning through play.

References

- Carlson, S. M., Davis, A. C., & Leach, J. G. (2005). Less is more: Executive function and symbolic representation in preschool children. *Psychological Science, 16*, 609-616. doi:10.1111/j.1467-9280.2005.01583.x
- Cheung, R. H. P. (2010). Designing movement activities to develop children's creativity in early childhood education. *Early Child Development and Care, 180*, 377-385. doi:10.1080/03004430801931196
- Connery, M. C., John-Steiner, V., & Marjanovic-Shane, A. (2018). *Vygotsky and creativity: A cultural-historical approach to play, meaning making, and the arts* (Second ed.). New York: Peter Lang.
- Fehr, K. K., & Russ, S. W. (2016). Pretend play and creativity in preschool-age children: Associations and brief intervention. *Psychology of Aesthetics, Creativity, and the Arts, 10*, 296-308. doi:10.1037/aca0000054
- Fullan, M., & Scott, G. (2014). *Education PLUS: The world will be led by people you can count on, including you!* [White paper]. Retrieved October 28, 2018, from Michael Fullan's website: <https://michaelfullan.ca/wp-content/uploads/2014/09/Education-Plus-A-Whitepaper-July-2014-1.pdf>
- Guilford, J. P. (1967). *The nature of human intelligence*. New York: McGraw-Hill.
- Hoffmann, J., & Russ, S. (2012). Pretend play, creativity, and emotion regulation in children. *Psychology of Aesthetics, Creativity, and the Arts, 6*, 175-184. doi:10.1037/a0026299
- Kaugars, A. S., & Russ, S. W. (2009). Assessing preschool children's pretend play: Preliminary validation of the affect in play scale-preschool version. *Early Education & Development, 20*, 733-755. doi:10.1080/10409280802545388
- Kogan, N., & Pankove, E. (1972). Creative ability over a five-year span. *Child Development, 43*, 427-442. doi:10.1111/j.1467-8624.1972.tb01114.x

- Kogan, N., & Pankove, E. (1974). Long-term predictive validity of divergent-thinking tests: Some negative evidence. *Journal of Educational Psychology, 66*, 802-810.
doi:10.1037/h0021521
- Lloyd, B., & Howe, N. (2003). Solitary play and convergent and divergent thinking skills in preschool children. *Early Childhood Research Quarterly, 18*, 22-41. doi:10.1016/S0885-2006(03)00004-8
- Lobo, Y. B., & Winsler, A. (2006). The effects of a creative dance and movement program on the social competence of head start preschoolers. *Social Development, 15*, 501-519.
doi:10.1111/j.1467-9507.2006.00353.x
- Mouchiroud, C., & Lubart, T. (2001). Children's original thinking: An empirical examination of alternative measures derived from divergent thinking tasks. *The Journal of Genetic Psychology, 162*, 382-401. doi:10.1080/00221320109597491
- Office of the United Nations High Commissioner for Human Rights. (1989). *Convention on the Rights of the Child*. Retrieved from
<https://www.ohchr.org/EN/ProfessionalInterest/Pages/CRC.aspx>
- Ooi, L. L., Baldwin, D., Coplan, R. J., & Rose-Krasnor, L. (2018). Young children's preference for solitary play: Implications for socio-emotional and school adjustment. *British Journal of Developmental Psychology, 36*, 501-507. doi:10.1111/bjdp.12236
- Ontario Ministry of Education. (2013). *Ontario Early Years Policy Framework*. Retrieved from
<http://www.edu.gov.on.ca/childcare/ontarioearlyyear.pdf>
- Ontario Ministry of Education. (2016). *21st Century Competencies*. Retrieved from
http://www.edugains.ca/resources21CL/About21stCentury/21CL_21stCenturyCompetencies.pdf

- Ontario Ministry of Education. (2016). Play-based learning in a culture of inquiry. In *The Kindergarten Program*. Retrieved from <https://www.ontario.ca/document/kindergarten-program-2016/play-based-learning-culture-inquiry>
- Runco, M. A. (1991). *Divergent thinking*. Norwood, N.J.: Ablex Pub. Corp.
- Runco, M. A., & Pezdek, K. (1984). The effect of television and radio on children's creativity. *Human Communication Research, 11*, 109-120. doi:10.1111/j.1468-2958.1984.tb00040.x
- Rushowy, K. (2017, September 6). Report card, curriculum changes on the way in Ontario. *Toronto Star*. Retrieved from <https://www.thestar.com>
- Russ, S. W. (2004). *Play in child development and psychotherapy: Toward empirically supported practice*. London; Mahwah, N.J.; Lawrence Erlbaum.
- Scibinetti, P., Tocci, N., & Pesce, C. (2011). Motor creativity and creative thinking in children: The diverging role of inhibition. *Creativity Research Journal, 23*, 262-272. doi:10.1080/10400419.2011.595993
- Silvia, P. J. (2008). Creativity and intelligence revisited: A latent variable analysis of Wallach and Kogan (1965). *Creativity Research Journal, 20*, 34-39. doi:10.1080/10400410701841807
- Silvia, P. J. (2011). Subjective scoring of divergent thinking: Examining the reliability of unusual uses, instances, and consequences tasks. *Thinking Skills and Creativity, 6*, 24-30.
- Slepian, M. L., & Ambady, N. (2012). Fluid movement and creativity. *Journal of Experimental Psychology: General, 141*, 625-629. doi:10.1037/a0027395
- Trevlas, E., Matsouka, O., & Zachopoulou, E. (2003). Relationship between playfulness and motor creativity in preschool children. *Early Child Development and Care, 173*, 535-543. doi:10.1080/0300443032000070482

Vygotsky, L. S. (2004). Imagination and creativity in childhood. *Journal of Russian and East European Psychology*, 42, 7-97.

Appendix I

Behavioural Observation Table adapted from Affect in Play-Preschool Scale (APS-P) (Kaugars & Russ, 2009)

Time	Play (A=alone, G=group) A=ambiguous)	Movement (A=active, S=sedentary)	Affect (P=positive, N=negative,
------	--	-------------------------------------	------------------------------------

0:10

0:20

0:30

0:40

0:50

1:00

1:10

1:20

1:30

1:40

1:50

2:00

2:10

2:20

2:30

2:40

2:50

3:00

(...)

5:00

Appendix II

Positive and Negative Affect Schedule for Children – Parent Version (adapted for teacher use from Ebesutani et al., 2011 and Ebesutani et al., 2012)

This scale has a number of words that describe different feelings and emotions. Read each item and then circle the best answer next to that word. Indicate to what extent your student has felt this way during the past few weeks. There are no right or wrong answers.

1 = Very Slightly
Extremely 2 = A little 3 = Moderately 4 = Quite a bit 5 =

Joyful	1	2	3	4	5
Miserable	1	2	3	4	5
Cheerful	1	2	3	4	5
Happy	1	2	3	4	5
Mad	1	2	3	4	5
Afraid	1	2	3	4	5
Lively	1	2	3	4	5
Scared	1	2	3	4	5
Proud	1	2	3	4	5
Sad	1	2	3	4	5

Appendix III

Child Scripts written for Alternate Uses Task (Wallach & Kogan, 1965)

Notes:

“Uses” will be defined as the manipulation of an object to perform a function. Simple manipulations of the object with no intended purpose do not meet this criterion and thus will not qualify.

Task will end when two minutes have elapsed or when the child has run out of uses to suggest. Child will receive a sticker as a small reward at the end of each session.

Standard Divergent Thinking Task

Experimenter: Today we are going to play a game with a(n) [ITEM]. Do you want to play the game with me?

***Task does not proceed unless child says yes.

Place item (i.e. roll of newspaper, marker etc.) on the table in front of the child and experimenter.

Experimenter: This is a(n) [ITEM]. Do you know what a(n) [ITEM] is?

If child says no, experimenter will place another object in front of child until child is able to identify object.

Experimenter: Can you please **tell me** the different ways you can use a(n) [ITEM]? If you tell me how to use a(n) [ITEM] I will show you and you can tell me if I'm doing it right.

Embodied Divergent Thinking Task

Experimenter: Today we are going to play a game with a(n) [ITEM]. Do you want to play the game with me?

***Task does not proceed unless child says yes.

Place item (i.e. roll of newspaper, marker etc.) on the table in front of the child and experimenter.

Experimenter: This is a(n) [ITEM]. Do you know what a(n) [ITEM] is?

If child says no, experimenter will place another object in front of child until child is able to identify object.

Experimenter: Can you please **tell me and show me** the different ways you can use a(n) [ITEM]?

Debrief Script

Thank you for playing this game with me! I really appreciate it. We have been playing these games to find out if you were better at one game than the other game. I was thinking that you might be better at the game where you got to touch the [ITEM] because you get to try more things with it.

TAYLOR BOYD

EDUCATION

Bachelor of Arts, Psychology, Honours Specialization – Huron University College at Western University
(Expected Graduation 2019)

HONOURS THESIS

My research examines the relationship between movement and creativity skills; specifically, how embodied cognition during a divergent thinking task can improve the creative output of preschool children. Additionally, I will determine the role of affect, movement and autonomy during play as mediating the relationship between movement and creativity.

RESEARCH INTERESTS

- Developmental psychology with a focus on educational psychology; specifically, creativity and motivation in elementary school classrooms
 - Research that explores play-based learning, teacher training, policy, curriculum development
-

WORK EXPERIENCE

Lab Manager, Huron University College, Western University, 2017 - Current

- Supervise and support research assistants with data analysis in lab of Dr. Donna Kotsopoulos for projects on education practice and policy in elementary and university classrooms
- Organize team meetings, identify research opportunities for dissemination of lab findings and assist with submission to conferences and publications

Writing Fellow, Huron University College Writing Services, Western University, 2018 - Current

- Assist undergraduate and graduate students with writing assignments including essays, proposals and resumes
- Contribute to team meetings and professional development workshops

Aquatic Supervisor, In-Service Trainer, Examiner, Swim Instructor, and Lifeguard,
City of Toronto, 2014 - Current

- Train lifeguards and swim instructors on first aid National Lifeguard skills; supervise and evaluate staff performance and facilitate in-service training
- Responsible for facility programming, procedure, health regulation compliance and incident documentation for emergencies
- Instruct and evaluate participants in aquatics programs, ranging from infants to adults

Swim and Leadership Instructor, City of London, 2015 - 2017

- Instructed children in Red Cross and Lifesaving Society programs; taught leadership courses to adolescent and adult participants including Standard First Aid and National Lifeguard

Skate Programs Instructor, City of Toronto, 2013 - 2015

- Instructed and evaluated adults and children in levels of the City of Toronto skating program

RESEARCH EXPERIENCE

Lab Manager, Huron University College, Western University – 2017 - Current

- Supervise and support research assistants with data collection and analysis in lab of Dr. Donna Kotsopoulos for projects on education practice and policy in elementary and university classrooms
- Review and edit data analysis, reports, papers and submissions for research staff
- Conduct literature reviews for researchers at Western University

Research Assistant, Lab of Dr. Rebecca Merkley, Western University – 2017 - 2018

- Administered tests exploring preschool children’s acquisition of new number words

Researcher, Telemark, Norway – 2017 Fall

- Designed and conducted independent study “Teacher Conceptions and Teaching Methods for Creativity in Norwegian Classrooms” under guidance of Dr. Marte Gulliksen of the University of South-Eastern Norway
- Observed classes and interviewed teachers and principals from three elementary schools; analysis revealed significant correlations which have implications for cross-cultural comparisons
- Research grant from the Norwegian Centre for International Cooperation in Education

Researcher, Huron University College, Western University – 2017 Spring

- Designed and conducted independent study “Impact of Learning Environment and Instructor Gender on University Students’ Performance Motivation Within the Classroom”
- Results suggested students rate professors who fit gender stereotypes higher than professors who do not use traditional gender-specific teaching approaches

Educational Partnership and Research Workshops, Huron University College, Western University, and the University of South-Eastern Norway – 2016 Fall

- Participated in a collaborative research workshop in Notodden, Norway as part of an international cooperation project to foster student mobility across disciplines
-

CONFERENCES

Boyd, T. (2018, December) *Teacher Conceptions and Teaching Methods for Creativity in Norwegian Classrooms*. Poster presented at the Research on Teaching and Learning Conference, Paul R. MacPherson Institute for Leadership, Innovation & Excellence in Teaching, McMaster University, Hamilton, Ontario.

Boyd, T. (2017, April) *Impact of Learning Environment and Instructor Gender on University Students’ Performance Motivation Within the Classroom*. Poster presented at the Centre for Undergraduate Research Learning Research Conference, Huron University College, Western University, London, Ontario.

Boyd, T. (2018, July) *Teacher Conceptions and Teaching Methods for Creativity in Norwegian Classrooms*. Poster presented at the Symposium on Education and Cognition, McMaster University, Hamilton, Ontario.

Boyd, T. (2017, July) *Impact of Learning Environment and Instructor Gender on University Students' Performance Motivation Within the Classroom*. Poster presented at the Symposium on Education and Cognition, McMaster University, Hamilton, Ontario.

Boyd, T. (2017, April) *Teacher Conceptions and Teaching Methods for Creativity in Norwegian Classrooms*. Poster presented at the Centre for Undergraduate Research Learning Research Conference, Huron University College, Western University, London, Ontario.

SUBMITTED PUBLICATIONS AND PROPOSALS

Boyd, T. (2019, January). *Influence of Classroom Assessment on Motivation, Autonomy and Creativity in Children*. Mitacs Globalink Research Award Application to Norway.

Boyd, T. (2018, December). *What Motivates Children to Be Creative?* Canada Graduate Scholarships-Master's Program application.

Dickson, B. A., Harris, L. M., Boyd, T., & Kotsopoulos, D. (2018, November). *Wide walls, mathematics, and computational thinking*. Paper submitted to the Psychology of Mathematics Educators – North American Chapter (PME-NA) Conference. University of South Carolina and Clemson University; Greenville, South Carolina.

Dickson, B. A., Harris, L. M., Boyd, T., & Kotsopoulos, D. (2018, July) *Coding and critical thinking: Beyond the mathematics curriculum*. Paper submitted to the American Educational Research Association Annual Meeting. Toronto, Ontario.

RELEVANT COURSEWORK

- Lab Mentor, Dynamics of Mentorship in Psychology Research, Psychology 3760G
- Does Motor Development Predict Language Development in Preschool Children?
- Intelligence and Self-Regulatory Ability in Preschoolers and Young Adults
- The Relationship Between Grit and Perseverance
- Egocentrism and Empathy: Reconciliation in *Sense and Sensibility*
- Policy Brief: Student Guidance in Ontario Schools

UNIVERSITY INVOLVEMENT

President, Huron Psychology Association, Huron University College, Western University – 2017 - Current

Undergraduate Editor, Western Undergraduate Psychology Journal, Western University – 2018 - Current

Student Representative, Centre for Undergraduate Research Learning, Huron University College, Western University – 2017 - Current

Vice-President of Events, Huron Psychology Association, Huron University College, Western University

– 2016 - 2017

Western Triathlon Club Member, Western University – 2016 - 2017

Western Varsity Figure Skating Team Athlete, Western University – 2015 - 2016

HONOURS AND AWARDS

2018 – **Research Fellowship Grant Recipient**, Centre for Undergraduate Research Learning, Huron University College, Western University

2018 – **Dr. Don Melady and Mr. Rowley Mossop Diversity Scholarship**, Huron University College, Western University

2016 - Current – **Dean’s Honour List**, Huron University College, Western University

2016 – **Western Mustangs Scholar Athlete Award**, Western University

2015 - Current – **Hellmuth Scholarship (renewable)**, Huron University College, Western University

2015 – **Loran National Finalist Award**, Loran Scholars Foundation

2015 – **Ontario Scholar**, Ontario Ministry of Education

2015 – **Workers Health & Safety Centre Scholarship**, Ontario Health and Safety Training Centre

2014 – **Toronto Star High School Newspaper Award, Sports Feature Writing**

VOLUNTEER EXPERIENCE

Trainer/Examiner, Royal Life Saving Society Canada, 2016 - Present

Teaching Assistant, Grade 3 ESL class, Thorncliffe Park Public School, Toronto, ON – 2016 Spring

Editor-in-Chief, The Epigram newspaper, Northern Secondary School, Toronto, ON – 2013 - 2015

Evaluator, Skate Canada Central Ontario – 2013 - 2015

Therapy Assistant, aquatics and therapeutic playroom programs, Holland Bloorview Kids Rehabilitation Hospital, Toronto, ON – 2013 – 2015

Co-Founder, Books in the Park – literacy initiative which provided new books to build personal libraries of students in high-needs areas in Toronto, ON – 2013 - 2015

Literacy Tutor, Leading to Reading program, Flemingdon Park Library, Toronto, ON – 2013 - 2014

Assistant Coach, North Toronto Skating Club, Toronto, ON – 2012 - 2013

