MULTI-AGE GROUPINGS IN EARLY CHILDHOOD EDUCATION:
THE AFFORDANCES AND OPPORTUNITIES
OF A MULTI-AGE CHILD CARE MODEL

by

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A thesis submitted in conformity with the requirements
for the degree of Master of Arts
Department of Human Development and Applied Psychology
Ontario Institute for Studies in Education of the
University of Toronto

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Abstract

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The present study was designed as an exploratory field investigation of children's interactions in one multi-age and one conventional age-segregated early childhood education program. Detailed observations of infants, toddlers, and preschoolers in their naturalistic settings yielded 275 documented interactions which were coded and analyzed. Categories derived from existing observation instruments and the literature were developed to provide a framework in which to address what affordances and opportunities a multi-age child care model may offer children when infants, toddlers, and preschoolers are grouped together in a program, as compared to children in age-segregated groupings. The study provides support for previous research that indicates that there are benefits for both younger and older children in multi-age groupings. The thesis concludes with the suggestion that multi-age child care models should be viewed as an acceptable option of group child care for families and their children.
I would like to acknowledge the following people whose support enabled me to accomplish the completion of this study. A special thank you to:

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The Educators of the child care centres who openly welcomed me into their playrooms and spent time discussing their programs.

The children who actually made this study possible.

Alla mia famiglia: a Mamma, a Peter, a Nino e a Lindo. Il loro infinito sostegno, la loro guida e il loro incoraggiamento, oltre al loro spirito gioioso, negli ultimi due anni, saranno sempre ricordati e apprezzati. (24 hour tech support can take a break now)
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Introduction

In early childhood education programs in Ontario, children are segregated by age according to the Day Nurseries Act (R.R.O. 1990, Reg. 262), which governs licensed child care. The homogeneous groups according to the Day Nurseries Act (R.R.O. 1990, Reg. 262, Schedule 3) are as follows:

<table>
<thead>
<tr>
<th>Grouping</th>
<th>Age of Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant</td>
<td>Under 18 months</td>
</tr>
<tr>
<td>Toddler</td>
<td>18 to 30 months (inclusive)</td>
</tr>
<tr>
<td>Preschool</td>
<td>30 months to 5 years of age (inclusive)</td>
</tr>
<tr>
<td>School Age</td>
<td>6 years of age to 12 years of age (inclusive)</td>
</tr>
</tbody>
</table>

However, there has been a recent shift in practice whereby a few licensed child care centres are grouping children of various ages together in one program. In what are referred to as multi-age programs, infants, toddlers, and preschool children are grouped together, and with few exceptions, interact with one another for the majority of the day.

As with any shift in practice, this potential move from age segregation to multi-age groupings has government officials and early childhood educators raising several issues, concerns, and questions. One of these questions pertains to the kinds of interactions that are occurring among the children. The question is an important one, and research is required in order to enhance our theoretical understanding of children’s interactions in multi-age programs. Therefore, my research objective is to determine what affordances and opportunities a multi-age child care model offers children when infants, toddlers, and
preschoolers are grouped together in a program. Based on Lev Vygotsky’s sociocultural theory (1978), Bodrova and Leong’s application of Vygotskian principles to early childhood education (1996), the Multi-age Relationship Observation Protocol (Ryerson, 1999), Furman, Rahe and Hartup’s (1979) category of reinforcement, and Goldman’s (1981) category of negative interaction, I have developed a checklist to record in detail the incidents that occur between children. By using Vygotskian concepts as a framework for observing and documenting interactions among children in a multi-age model as well as in an age-segregated program, my study will address the specific research question: “how may interactions between children in multi-age programs differ from those in age-segregated programs”?

There have been few studies conducted in the area of multi-age programming for children from infancy to preschool. Research has mainly focused on the benefits of multi-age groupings for children in elementary school grades. Experiments that include children younger than 5 years of age tend to be artificially contrived in laboratories and in some cases the children are not familiar with one another. In this study, I examine children’s interactions in their natural settings.
Literature Review

Overview

The literature review is divided into four sections. In the first section, I will address the historical context of age groupings in child care centres. Second, I will examine several issues related to multi-age programs. In the third section, I will discuss Vygotskian principles and how they relate to early childhood multi-age programs. Finally, in the fourth section I will examine studies of children’s interactions in multi-age and conventional age-segregated settings.

Historical Context

From Multi-Age to Age-Segregated Playrooms

In Ontario, children enrolled in early childhood settings are grouped with children of the same age, in accordance with the Day Nurseries Act, which governs child care in Ontario. However, an alternative to this practice is the multi-age grouping that includes infants through to preschool children.

Historically infants and preschoolers were grouped together but by the mid 1930s, there was a gradual movement to eliminate infants from group care. Varga (1997) has chronicled the path from multi-age to age segregated groupings in Canadian child care centers. In Ontario, centres such as East End Nursery, Ottawa Nursery, and Victoria Nursery (1950, 1960, 1935 respectively) excluded infants from their care, based on the principles that
infants were not developmentally ready for social experiences and that group care could be detrimental to their well-being. In addition, the 1930s and 1940s saw the elimination of school age care due to the belief that mixed age groupings were detrimental to children, regardless of age. Moreover, provincial funding in Ontario was restricted to preschool programs. Consequently, as more space became available for dividing children into same age groups, homogeneous age groupings of children became the norm in child care centres (Varga, 1997).

Current Practice

Literature stating the intent behind the age groupings as set out by the Ontario Ministry of Community and Social Services (MCSS) is sparse. However, in the early 1980s, MCSS released a policy statement on standards for child care centres. According to A. Scott-Anthony (personal communication, April 17, 2000), the policy statement formed the foundation for a major revision of standards in the regulation under the Day Nurseries Act, which was first legislated in 1946. One such change, albeit for toddlers only, addressed age groupings. The rationale for this change stemmed from the notion that “children in the 24 to 30 month group appear, in general, to have needs for adult support more like those from 18 to 24 months than like those from 30 months to five years of age” (MCSS, 1983, p. 55). In marked contrast, no rationale or theoretical support was stated for the groupings of infants or preschoolers.

However, revisions to the legislation did permit 20% of the children in a grouping to be outside of the age parameters (Day Nurseries Act, 1990, section 55 subsection 2a). “This should allow flexibility in the placement of children in communities where no toddler
program operates” (MCSS, 1983, p. 55). Notwithstanding the focus on toddlers, the under- and over-age extensions are also applicable to the other age groupings.

The current practice reflects the age groupings set in the early 1980s, and it is within these limitations that child care programs in Ontario must establish their groupings. In the next section, I examine emergent issues in the current practice of multi-age programs.

**Issues in Multi-age Early Childhood Education Programs**

**Introduction**

The multi-age model, albeit not the norm in early childhood programs, may be an alternative to age segregated models. There is now a growing body of research (Katz, 1995; McClellan, 1993; Roopnarine & Johnson, 1984) that supports multi-age groupings and results are indicating that there are benefits for both younger and older children. Conversely, there are controversial issues that need to be investigated if we are to understand the influence of multi-age programs on children’s development.

**Continuity of Care**

One possible benefit of multi-age programs is continuity of care for young children. Continuity of care refers to the consistency that early childhood educators provide to young children when they are together for long periods. In age-segregated programs, it is common for children to move to new groupings several times within their first five years of life. On the other hand, when enrolled in a multi-age program, children stay with their educators throughout the preschool years, ensuring consistency and stability. Berk and Winsler (1995)
argue that, "having children stay with the same teacher and the same set of peers for three years is consistent with Vygotsky’s emphasis on history and the importance of understanding the development of children’s social interactions and relationships over time" (p. 145).

Moreover, research has examined the effects of staff turnover and its influence on children’s behaviour and results support the consistency of educators during the early years (Howes & Rubenstein, 1985; Cummings, 1980; Howes & Hamilton, 1993; Whitebook, Howes & Phillips, 1990 as cited in Doherty-Derkowski, 1995).

Another benefit attributed to multi-age programs is the ability of educators to meet the needs of the children given the small numbers of same-age peers within a multi-age grouping. Whaley & Kantor (1992) argue that multi-age programs afford educators the opportunity to be heedful, thus responding to infant needs appropriately. In other words, since the caregiving required by infants is fairly similar from one to the next, meeting the needs of only 3 infants within a group composed of infants, toddlers and preschoolers is more manageable than attending to 10 infants in an age-segregated grouping.

However, we must exercise caution, since their argument is based on personal experience and not systematic research evidence. Before claims such as the one posited by Whaley and Kantor can be accepted, studies examining differences in care giving responsiveness in multi-age versus age-segregated programs is needed.
**Developmental Differences**

The notion that children of the same age are in similar developmental stages forms the basis for the curriculum of many early childhood education programs. In age-segregated programs, there may be a tendency to view same-age peers as having similar needs and abilities. Consequently, activities are planned for the whole group instead of the individual child. McClellan (1993) refers to this as a “factory model of education” (p. 1). By contrast, multi-age programs offer educators a rare opportunity to challenge this notion and to view children as unique individuals within a group setting. Multi-age groupings open up the possibility for a wider range of maturity levels (Schrier & Mercado, 1994), acceptance and tolerance of others (Katz, 1995), and opportunities for younger children to imitate their older peers and for the older children to develop nurturing skills ((Bergman & Gainer, 1999, p. 58).

**Nurturing Younger Children**

Multi-age groupings may be conducive to children enhancing their nurturing skills. French’s (1984) research indicates that older children tend to display sympathy towards younger children. French’s results also suggest that although not significantly preferred over same-age counterparts, older children are favoured by younger peers needing assistance. Moreover, older children display sensitivity toward their younger peers when engaged in a task together (Graziano, French, Brownell & Hartup, 1976).

In addition, McClellan (1993) posits that multi-age programs offer opportunities for children to care for one another. This is further supported by Melson, Fogel & Mistry’s research. (as cited in Melson & Fogel, 1988) which showed that preschool children, when faced with a crying infant, attempted to distract the infant with a toy.
Safety of Infants

By contrast, a contentious issue amongst professionals is the safety of infants within a multi-age program. Understandably, it is difficult for educators who have training in age-segregated settings to conceive of how infants can be safe when placed in the same environment with older children. Bernhard, Pollard, Piérola, Pacini-Ketchabaw, and Morin’s (1998) preliminary study of multi-age programs in Canada found that safety was a controversial point with educators who did not work with infants, whereas “centres that had infant/toddler mixing did not report such problems” (p. 9).

Furthermore, Whaley and Kantor (1992), in their ongoing study of a multi-age grouping of infants and toddlers, have found that there are fewer conflicts and less competition amongst the children. They infer that educators have more opportunity to respond to the needs of the children because of an admixture of developmental levels as compared with similar developmental levels in age-segregated groupings. In other words, it is more manageable to meet the similar needs of only five toddlers in a group than it is to address those same needs in a group of 10 to 15 toddlers.

Learning Opportunities

Multi-age programs may provide opportunities for younger children to learn from older children. Correspondingly, older children have an opportunity to refine their skills by assisting their younger peers. Roopnarine and Johnson (1984) observed the activities of 23 children whose ages ranged from 3- to 8-years for a period of 8 weeks. Their research provides evidence which supports the notion that older children in multi-age programs have opportunities to enhance their informal teaching skills with younger peers. In addition,
Ludeke and Hartup's study (as cited in Evangelou, 1989) indicates that children are more likely to offer instruction to younger rather than same-age children. Brody and Stoneman (1981) in their two-part study investigated children’s imitation of younger, same-age, and older peers. Children were paired with models who were younger, the same-age or older. The results indicate that, “… children selectively imitated both same age and older models when those models were paired with a younger peer model” (p. 720).

One may argue that imitation of others does not necessarily indicate that learning is occurring. In other words, a child is only copying the behaviour of another without the cognitive understanding of the behaviour. Vygotsky (1978) challenges this notion and posits that children can only imitate what is within the scope of their development. Furthermore, Vygotsky (1978, p. 88) argues that, “using imitation, children are capable of doing much more in collective activity …”. Therefore, it seems reasonable to propose that in a multi-age program children can encounter opportunities for modeling behaviours and skills to the younger children and alternatively imitating the older ones.

By contrast, controversy ensues over the effects of possible interruptions by the younger children when older children are involved in a task. How are preschoolers affected when infants and toddlers intervene in their play? Another critical related issue has to do with the type of materials available to preschool children in a multi-age grouping. It seems reasonable to suggest that, for safety reasons, all materials which are accessible must be safe for the younger children; hence, the question arises as to whether the older children are receiving optimal learning opportunities in the absence of presumably more sophisticated but possibly dangerous materials. Much research is still needed if we are to understand how multi-age environments influence preschool children’s play.
In the next section, I address Lev Vygotsky’s socio-cultural theory and how its principles may be applied to early childhood education settings and, specifically, to multi-age programs.

The Application of Lev Vygotsky’s Principles to Early Childhood Education Programs

Introduction

Lev Vygotsky’s concepts offer ideal observation lenses for a field investigation of a multi-age program in which interactions naturally occur between children of different ages. Hence, this section is comprised of subsections outlining three Vygotskian concepts and how they relate to early childhood multi-age programs. First, I will review the literature regarding the zone of proximal development. Second, I will discuss the notion of scaffolding. Lastly, I will discuss the concept of leading activities.

Zone of Proximal Development

An important concept of Lev Vygotsky’s socio-cultural theory is the zone of proximal development (ZPD). Vygotsky defines ZPD as “… the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (1978, p. 86). Thus, the more capable individual, known as the expert, provides the novice with assistance, consisting of prompts, hints and questions, to accomplish a task which otherwise would be beyond the novice’s reach.
According to Azmitia’s (1988), study of experts and novices collaborating on a task of block building, the experts in mixed-ability dyads gave more information to their less competent partners and positively influenced their learning, compared to their age-mates working alone or in dyads of similar abilities. Compared to the other novices, “only novices who worked with an expert generalized their skills to the individual posttest” (p. 94).

Bodrova and Leong (1996) argue that the adult is not the only person who is capable of giving children assistance. “Vygotsky believed that the child can start performing on a higher level of ZPD through any type of social interaction: interactions with peers as equals, with imaginary partners, or with children at other developmental levels” (Newman & Holzman, 1993 as cited in Bodrova & Leong, 1996, p. 40). Moreover, Berk and Winsler (1995, p. 131) argue that, “Vygotsky emphasized the importance of mixed-age groupings of children, which grant each child access to more knowledgeable companions and permit each child to serve as an expert resource for others”. Thus, multi-age child care groupings can be seen as more advantageous to children than age-segregated groupings.

Scaffolding

As experts assist children through the zone of proximal development, they are engaged in what has been termed as scaffolding. The metaphor, introduced by Wood, Bruner, and Ross (as cited in Wood & Wood, 1996) characterizes the kind of interaction that occurs between the expert and novice. Brown and Palincsar (as cited in Katz et al., 1990, p. 18), refer to scaffolding as a temporary support. Scaffolding provides an expert with a framework in which to provide a less competent peer with hints, prompts, and support; thus enabling the novice to master a particular skill. Through collaborative activity, the expert scaffolds the
novice through the zone of proximal development. As the novice gains in skill or knowledge, the expert gradually fades the level of assistance until it is evident that it is no longer needed.

Even quite young children can scaffold less competent peers if their “expert” help is within the novices’ zone of proximal development (Berk & Winsler, 1995, p. 132). Novices cannot learn skills that are outside the limits of their zone of proximal development; “when a skill is outside of the ZPD, children generally ignore, fail to use, or incorrectly use that skill” (Bodrova & Leong, 1996, p. 39).

Future research should investigate the quality of scaffolding occurring among children in early childhood multi-age programs in order to assess how effective preschoolers are at assessing and responding to the needs of younger children. In addition, it would also be interesting to investigate whether preschoolers are adept at adjusting their assistance as their younger peers gradually gain the necessary skills to accomplish the set task.

**Leading Activities**

Vygotsky’s emphasis on the influence of the social environment on children’s development provided the foundation for the concept of “developmental accomplishments” (Bodrova & Leong, 1996). Bodrova and Leong (1996) developed the term to define “the new cognitive and emotional formations that appear at different ages” (Bodrova & Leong, 1996, p. 159). Furthermore, “Leont’ev (1977/1978) used the concept of leading activity to specify the types of interactions between the child and the social environment that lead to developmental accomplishments” (as cited in Bodrova & Leong, 1996, p. 50). Leading activities differ for each stage of development and are pivotal to children’s developmental accomplishments. According to Leont’ev and Elkonin, (as cited in Bodrova & Leong, 1996,
the following are the leading activities that are central to the individual developmental stages:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Leading Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant (birth to 1-year-old)</td>
<td>Emotional Communication</td>
</tr>
<tr>
<td>Toddler (1- to 3-years-old)</td>
<td>Manipulation of Objects</td>
</tr>
<tr>
<td>Preschool (2.6- to 6-years-old)</td>
<td>Play</td>
</tr>
</tbody>
</table>

During the child’s activity, the adult engages the infant in emotional communication, which consists of both verbal and non-verbal exchanges. As a toddler, the child learns by manipulating objects in the environment. Finally, the preschool child engages in play that enhances both cognitive and social development (as cited in Bodrova & Leong, 1996).

The question that must be asked is: Do children in multi-age groupings have more opportunities to engage in leading activities with other children than their peers in age-segregated settings? The present study attempts to address this question.

Children’s Interactions in Multi-Age Groupings

Introduction

A review of the literature related to multi-age groupings reveals that a great deal of research has attempted to identify the social benefits for children. In multi-age groupings, children have occasion to engage in interactions with younger and older counterparts. These opportunities may be particular to multi-age groupings and not so readily available in age-
segregated programs. Examples of such opportunities are: assisting with the feeding of a younger child, assisting another child with a task, opportunities to ‘teach’ others, nurturing younger children, and participating in a program with siblings or neighbourhood friends. Wertsch (as cited in Whaley & Kantor, 1992) suggests that based on Vygotskian notions “... children should regularly have the opportunity to interact with children of a wide age range as they would naturally in a family or community setting” (p. 2). Furthermore, McClellan posits “… that the mixedage [sic] classroom offers numerous opportunities to support children’s social development, including prosocial and friendship behaviors and children’s cognitive development” (1993, p. 2). In addition, children are more inclined to display prosocial behaviour in mixed-age groups (Evangelou 1989; McClellan & Kinsey, 1996; and Whiting as cited in Evangelou, 1989). Brownell’s research on interactions in mixed toddler/preschool dyads indicates that, “when paired with an older, more affectively positive and more sociable partner, 18-month-olds were more interactive and more positive than with same-age peers” (1990, p. 844). Conversely, “both younger and older children exchanged more turns during social interaction with a 24-month-old partner … than with an 18-month-old partner …” (1990, p. 842).

Roopnarine and Johnson (1984), in their investigation of social interactions in 3- to 8-year old children, showed that preschoolers interacted more with kindergarten than with same-age or school age children. Conversely, the kindergarten children interacted more with age-mates than with either the preschool or school age children. However, the results show that “… a good deal of cross-age interaction occurred. Both older and younger children were in a position to benefit from the mixed-age program” (Roopnarine & Johnson, 1984, p. 831).
Ascertaining optimal age spans and influences on children's choice of playmates in multi-age groupings in early childhood programs may be a topic for future research.

Graziano, French, Brownell & Hartup (1976) examined same- and mixed-age triads of 231 grade one and grade three children. An experimenter instructed the children to build a tower from building blocks, and recorded each triad member’s contribution to the task. Results indicate that the mixed-age triads of one grade three and two grade two children yielded the highest level of performance.

Furthermore, studies show that socially, multi-age groupings encourage co-operation (Elkind, 1987), increase social activity of less socially mature same-age peers (Furman, Rahe, & Hartup, 1979), have fewer cases of children who are isolated and rejected (McClellan & Kinsey, 1986) and afford opportunities for more complex levels of play (Howes & Farver, 1987).

**Play**

Observing children in play situations provides researchers an opportunity to examine play patterns and interactions among peers. With multi-age groupings, the question emerges as to whether mixed-age groups of children display different play patterns than same-age groups.

Howes and Farver’s (1987) study indicates that when 2-year-olds interact with an older peer, they engage in more complex and cooperative social pretend play. However, we can ask: In the asymmetrical interactions that occur in mixed-age groupings, what does each child contribute to the play? To investigate this question, Howes and Farver conducted a subsequent study and observed toddlers in three separate situations. In the first and last
situation, the toddler was coupled with a same age child and in the second with a 5-year-old child. The results indicate that toddlers who had played with the 5-year-olds did not transfer the more complex form of play to same-age situations, and the authors conclude that “the toddler, limited in pretense and communicative skills, is less able to create the same complex play when interacting with age-mates” (Howes & Farver, 1987, p. 313). Consistent with this finding, Katz, Evangelou, and Hartman (1990, p. 16), argue that, “younger children can engage in more interactive and complex types of play when older peers are easily accessible to them than when they are in homogeneous age groups”. Thus, it may be that conventional early childhood settings are denying toddlers an opportunity to engage in complex acts of play by separating them from older children.

Mounts and Roopnarine (1987) examined social-cognitive modes of play within same- and mixed-age groups of 3- and 4-year-old children. They found that the 3-year-olds in a mixed-age classroom engaged in more complex modes of play than the 3-year-olds in the same-age classrooms. Conversely, the play of the 4-year-old children did not differ between the two groups. It may appear however, that the older children did have an opportunity to refine their informal teaching skills when interacting with younger children.

Goldman (1981), in a two-part study, investigated social participation among 3- and 4-year-old children in same- and mixed-age groups. Goldman’s findings indicate that, compared to their counterparts in the same-age groupings, the 3-year-old children in mixed-age groupings spent significantly less time in parallel play. Similar results were found for the four-year-old children. Surprisingly, the 4-year-old children in mixed-age groupings spent significantly more time in solitary play than their age-mates in the same-age groupings. However, we must keep in mind that solitary play, albeit a characteristic of younger
children’s play, is not indicative of immaturity in older children but rather a reflection of a goal directed activity (Johnson & Ershler, 1981; Roper & Hinde, 1978; Rubin, Maioni, & Hornung, 1976).

Blasco, Bailey & Burchinal (1993) hypothesize that multi-age groupings may enhance children’s dimensions of mastery during play. The researchers randomly assigned 48 children from 18- to 60-months-old to either a same- or mixed-age classroom. Participants included both typically developing children and those with special needs. Observers coded the sophistication of play and the results indicate that, compared to their counterparts in the same-age classrooms, typically developing children in mixed-age classrooms were just as apt to become involved in dramatic play. The researchers cite the ability to generalize social skills and developmental maturation as probable reasons for the lack of difference between the same- and mixed-age classrooms (p. 203). Conversely, children with special needs in the same-age classrooms “... spent more time simply manipulating materials than in purposeful play or social play compared to their peers in the other classrooms” (p. 203). In effect, when placed in a homogeneous group, children with special needs displayed lower levels of play sophistication.

Leadership

Decision making behaviour may be different in same- and mixed-age groups of children. Graziano, et al. (1976) found that singleton grade three children in mixed-age triads with grade one children demonstrate increased leadership behaviors. Similarly, French (1984) analyzed the responses given by 43 grade one, and 52 grade three children to
questions related to relationships. Results indicate that, “older children were selected to fulfill leadership roles in preference to both younger ... and same-age children ...” (p. 1432).

French, Wass, Stright, and Baker (1986) explored leadership behaviours in same- and mixed-age triads of children ranging in age from 7 to 11 years. The results indicate that older children in mixed-age groupings demonstrate more leadership behaviours than their age-mates in same-age triads. “These children facilitated the participation of their younger group members by soliciting opinions, organizing the decision-making process, and refraining from stressing their own opinions” (French et al., 1986, p. 282). Similarly, Stright and French (1988) suggest that the social milieu of multi-age groupings may provide the appropriate environment for children to enhance their leadership skills. Their research indicates that “the older children in the mixed-age groups facilitated and organised the participation of the younger children, and did not utilise simple dominance to control the decision” (Stright, 1988, p. 513).

To date, studies investigating leadership in multi-age groupings tend to focus on school age children. Empirical evidence that supports the same results for children in early childhood education programs is required to enhance our understanding of leadership behaviours in multi-age groupings.

Summary

Research supports the benefits of multi-age groupings. Findings indicate that both older and younger children benefit in several ways: the continuity of care, acceptance of developmental differences, opportunities to develop nurturing skills, effective learning opportunities, enhanced play patterns and opportunities to display leadership behaviours.
However, it must be noted that the majority of studies (Brody & Stoneman, 1981; Brownell 1990; Graziano, French, Brownell & Hartup 1976) examined multi-age groupings outside of the children’s natural environment. Furthermore, dyads or triads were common groupings for the observations of mixed-age interactions and so are not reflective of early childhood programs (Howes & Farver, 1987; Brownell 1990). Grouping unfamiliar children and assigning them tasks was also typical of these studies, and again the findings may not be applicable to early childhood programs (Brody & Stoneman, 1981; Graziano, French, Brownell & Hartup 1976). Moreover, there is a void in studies investigating multi-age groupings of infants and toddlers. Future research involving young children in their natural environment is warranted if we are to understand the implications of multi-age groupings in the early years.
The Present Study

Purpose

Designed as an exploratory field investigation of multi-age groupings in early childhood education programs, the purpose of this study is threefold. The first purpose is to observe and document interaction patterns and incidents that occur among children in an early childhood education program. The second purpose is to add to the growing research related to multi-age groupings as an alternative to conventional age segregated programs in child care centres. The third purpose is to provide information for policy developers, government officials, faculty in early childhood education programs and early childhood educators regarding the kinds of outcomes that can be expected for multi-age programs as an alternative form of quality child care.

Research Objective

My research objective is to determine what affordances and opportunities are offered in a multi-age child care model, as compared to a conventional age-segregated model.
Definition of Terms

Multi-age

In terms of the present research, the definition of multi-age is the placement of infants, toddlers, and preschoolers (i.e., 0-5 years) together in one group for the majority of the day.

Affordances

Eleanor Gibson (1988) and James Gibson's (1986) research in the area of visual perception illuminates the concept of affordances. Berger (1998) defines affordances as “the various opportunities for interaction that an object offers. These opportunities are perceived differently by each person depending on his or her past experiences and present needs” (p.162). It is important to note that for the purposes of this study, the term affordances is not limited to objects in the environment but also includes the people in the child’s life.

Scaffolding

Although Vygotsky did not use the term scaffolding, the expression was developed by scholars based on the notion of tutoring and guiding novices through the zone of proximal development (Wood & Wood, 1996). Berk & Winsler’s (1995) definition of scaffolding will be used in the present study.

A changing quality of support over a teaching session, in which a more skilled partner adjusts the assistance he or she provides to fit the child’s current level of performance. More support is offered when a task is new; less is provided as the child’s competence increases, thereby fostering the child’s autonomy and independent mastery (p. 171).
Zone of Proximal Development

An important concept of Lev Vygotsky’s socio-cultural theory is the zone of proximal development (ZPD). Vygotsky defines ZPD as “… the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (1978, p. 86).

Categories

Categories are employed in order to provide a framework in which to organize the data and to address the research objective. The headings introducing the sections of the child-to-child interaction checklist (see Appendix E) form the basis of the categories. The categories are as follows:

1. Receptive of Others in Play
2. Adaptive Behaviour: To Meet the Needs of Other Children
3. Negotiations
4. Observations and Reactions
5. Infants: Leading Activities
6. Toddlers: Leading Activities
7. Preschoolers: Leading Activities
8. Communication
9. Role of Peers in Shared Activity
10. Other-Regulation: Regulating Behaviours of Others
Category 1: Receptive of Others in Play

This category is divided into components that may be indicative of a child being receptive of others during play. Specifically, I will examine the number of times children offer their peers toys/materials, how often a child assigns other children a role to play, and how often a child invites a child or children to join in the play.

Category 2: Adaptive Behaviour: To Meet the Needs of Other Children

This category is comprised of indicators that may demonstrate that children will adapt their behaviour in different ways to meet the needs of others. Specifically, I will examine whether the following acts occur:

- A child models a task step by step to another child.
- A child offers verbal or physical guidance to another child.
- A child changes his/her tone of voice, speech, or word selection when interacting with others.
- A child changes his/her proximity to another child or alters his or her gestures in order to meet the needs of others.

Category 3: Negotiations

This category incorporates the notion that children will negotiate with other children when working at a task or in play. For the purposes of this study, I was interested in determining if children in multi-age programs were engaging in forms of negotiating with same- and mixed-age peers. As this category has a number of criteria listed, please refer to the checklist in Appendix E.
Category 4: Observations and Reactions

In this category, I will discuss the actions of younger children when observing other children in the setting. In particular, how does a younger child react when observing older peers at play or working on a task? Reaction is defined by several behaviours: child observes from the periphery, child gradually moves closer to the other children, child joins in the activity, and lastly, the child observes and then is noted to imitate the behaviour at a later time.

Categories 5, 6, and 7: Infants, Toddlers, and Preschoolers: Leading Activities

Category 5 (infants: leading activities), Category 6 (toddlers: leading activities), and Category 7 (preschoolers: leading activities) emerge from the term leading activities developed by Leont’ev (as cited in Bodrova and Leong, 1996). In particular, I was interested in observing whether children in a multi-age grouping had more opportunities to engage in leading activities with mixed-age peers than with same-age counterparts. This category helps to explore what special affordances, if any, the children may encounter in a multi-age program by virtue of naturally interacting with mixed-age peers.

Category 8: Communication

In this category, I will examine communication among children. It is divided into two sub-sections, positive and negative interactions. The interactions are coded as Initiator (the child initiating the social bid) and Recipient (the child who is the target of the social bid). Specifically the objective is to determine how often an interaction is positive or negative among same- and mixed-age children.
Observable positive interactions are adapted from Furman, Rahe, and Hartup's study (1979) and include prosocial behaviours such as “help giving, guidance, praise, affection, reassurance, protection, ... compliance, acceptance of directions, ... warm greetings, smiling and laughing, invitation to plan ...” (p. 917). Conversely, negative interactions, adapted from Goldman's study (1981), include any “... interaction which involves a physical or verbal threat, attack, interfering with the ongoing activity of another, or denying activities or privileges” (p. 646).

**Category 9: Role of Peers in Shared Activity**

This category applies to the role a child adopts when involved in an activity with same- or mixed-age children. Specifically, I will examine whether the following behaviours occur:

- Co-operating to successfully complete a task
- Assuming assigned roles
- Acting as a sounding board for a peer
- Acting for an imaginary person
- Acting as the expert (initiated by the expert)
- Acting as the novice (initiated by the novice)
- Creating cognitive conflict

**Category 10: Other-Regulation: Regulating Behaviours of Others**

In this category, I will examine whether children in a multi-age grouping regulate the behaviours of their same- and mixed-age peers. Specifically, I am interested in the opportunities available for children to engage in “other-regulation” in a multi-age grouping as compared to children in a conventional grouping.
Method

Introduction

This study is designed specifically as an exploratory field investigation to examine interactions among children in one multi-age and one conventional age-segregated early childhood education program. Having been informed that one child care centre was an age-segregated program, the reader might assume that no cross age interactions could occur. However, in designing my methodology, I allowed for the possibility that there might be visits between the age-segregated playrooms.

I have chosen to combine quantitative and qualitative approaches for this study. First, I engaged in naturalistic observations. As a non-participant observer, I documented descriptive sequences of the children’s interactions. Second, I coded the running records according to criteria listed in a child-to-child interaction checklist. Third, I employed categories, vignettes (pseudonyms have been employed in order to protect the identity of the children), and descriptive statistics as a means to describe the data.
Participants

Multi-Age Program

Overview

Located in a University in a major urban city in Southern Ontario, the laboratory child care centre has been operating since 1963. The centre originally operated as a preschool program, and in 1976, the infant and toddler programs were established. The multi-age model, designated as a pilot project began in September of 1995.

There are three multi-age programs within the child care centre. Each group consists of three infants, five toddlers, and eight preschoolers. In each grouping there is one space reserved for a child with special needs. The children are together for the majority of the day. However, one exception to this is outside play at which time the infants are separated from the rest of the children.

Children

Observations were conducted on 18 children enrolled in one of three multi-age programs in a university-based child care centre. There was one child with special needs enrolled in the program during the observation period. Although the children are grouped together, they are still enrolled based on the age-segregated categories of the Day Nurseries Act (R.R.O. 1990, Reg. 262, Schedule 3). It is important to note that the Day Nurseries Act (1990, section 55 subsection 2a) allows for 20% of the children in a grouping to be outside of
the age parameters. Table 1 outlines the age ranges of the children at the beginning and end of the observations.

Table 1

**Age Ranges of Children at the Beginning and End of the Observations as per the Day Nurseries Act (DNA)**

<table>
<thead>
<tr>
<th>Grouping</th>
<th>Age Range of Children As per the DNA</th>
<th>Age Range at beginning of study</th>
<th>Age Range at end of observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant</td>
<td>&lt; 18 months</td>
<td>6 to 11.5 months</td>
<td>7.5 to 14.5 months*</td>
</tr>
<tr>
<td>Toddler</td>
<td>18 to 30 months</td>
<td>18.5 to 29 months</td>
<td>21.5 to 32 months</td>
</tr>
<tr>
<td>Preschool</td>
<td>30 to 60 months</td>
<td>31 to 53.75 months</td>
<td>34 to 56.75 months</td>
</tr>
</tbody>
</table>

*Note: *One infant started the program after the observations began, hence the young age of 7.5 months at the end of the observations.

Based on the Day Nurseries Act, the number of children in each age category should be as follows: three infants, five toddlers, and eight preschoolers with 16 children per grouping. However, as a result of part-time spaces the number of children exceeded 16 but in enrollment only. In practice, aside from absences, only 16 children attended the program at one time. Table two breaks down the enrollment pattern of the program according to the Day Nurseries Act (R.R.O. 1990, Reg. 262, Schedule 3).
Table II
Enrollment Pattern of the Children Attending the Multi-age Program as per the Day Nurseries Act (DNA)

<table>
<thead>
<tr>
<th>Grouping as per the DNA</th>
<th>Licensed Capacity</th>
<th>Total Number of Children Enrolled</th>
<th>Full-time</th>
<th>Part-time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant</td>
<td>3</td>
<td>3(^a)</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Toddler</td>
<td>5</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Preschool</td>
<td>8</td>
<td>9</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>

Note. \(^a\) At the beginning of the study, two infants were enrolled in the program and one month later, the third infant started the program.

Although the children are grouped together, the child care centre is still required by provincial legislation to maintain adult to child ratios (Day Nurseries Act. R.R.O. 1990, Reg. 262, Schedule 3). Thus, there are three Early Childhood Educators (ECE) per multi-age grouping. Specifically there is one ECE for three infants, one ECE for five toddlers, and one ECE for eight preschoolers. However, all three educators are responsible for all of the children.

Of the eight preschool children, five began in the program as infants, two enrolled as toddlers, and two enrolled as preschoolers, one of which is a child with special needs. Of the six toddlers, four began in the program as infants and two on the cusp of infant/toddlerhood. The children had no exposure to the previous age-segregated program.
Setting

The children spend the majority of the day in a 68.2 square metre (735 sq. ft.) playroom designed to support the needs of the children in the group. The environment includes toys, materials, and child-size furniture such as tables, chairs, and toy shelves. The playroom is divided into distinct interest areas such as: art, blocks, drama, literacy, music, and sensory. The children also have a pet rabbit, which makes its home in a cage between the drama and book centre. Adjacent to the playroom is a sleep room for the infants (the older children sleep on cots which are placed throughout the room during naptime), a cubby area for the children’s personal belongings, and a washroom area, which includes child size toilets, child size sinks, and a diaper change table. Please refer to Appendix A for a floor plan of the playroom.

Conventional Age-Segregated Program

Overview

This program serves as a workplace child care centre for a large corporation and is located in a major urban city in Southern Ontario. Operated by a Board of Directors, this not-for-profit centre was established in 1989. The centre offers care for children ranging in age from birth to 5-years-old. As per the Day Nurseries Act (R.R.O. 1990, Reg. 262, Schedule 3), the children are grouped by age, thus there is an infant, toddler, and preschool program. However, based on centre policy, the preschool program is divided into two groupings and referred to as the preschool program, ages 30 – 48 months, and the kindergarten program, ages 48 – 60 months.
Children

Observations were conducted on 14 infants, 16 toddlers, 15 preschoolers, and 1 kindergarten child who visited the preschool program for one morning. There were no children with special needs enrolled in any of the age-segregated programs during the observation period. Between September and December 1999, five infants moved to the toddler program, two toddlers moved to the preschool program and two toddlers withdrew from the centre. In addition, five infants and one preschool child were enrolled in their respective age groups. Table 3 outlines the age ranges of the participating children at the beginning and end of the observations.

Table III

Age Ranges of Children at the Beginning and End of the Observations as per the Day Nurseries Act (DNA) (R.R.O. 1990, Reg. 262, Schedule 3)

<table>
<thead>
<tr>
<th>Grouping</th>
<th>Age Range of Children As per the DNA</th>
<th>Age Range at beginning of study</th>
<th>Age Range at end of observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant</td>
<td>&lt; 18 months</td>
<td>10 to 17 months</td>
<td>8 to 17.5 months</td>
</tr>
<tr>
<td>Toddler</td>
<td>18 to 30 months</td>
<td>17.5 to 27.5 months</td>
<td>16.5 to 27.5 months</td>
</tr>
<tr>
<td>Preschool</td>
<td>30 to 60 months</td>
<td>27.5 to 40 months</td>
<td>29 to 43 months</td>
</tr>
</tbody>
</table>

Note. One kindergarten child (55 months) visited the preschool program one morning and was included in one observation.

Of the 16 toddlers, 14 started their care in the infant program and the remaining two enrolled in the toddler program. Of the 15 preschool children, 11 children began their care in the infant program, three children in the toddler program and one in the preschool program.
Setting

Infant Room

The children spend the majority of the day in a 31.4 square metre (338 sq. ft.) playroom, which is designed to meet the needs of the children in the group. There is one low toy self with a variety of toys and books. There are also several mats of different sizes and colours, which the children sit on or climb. Additional toys are placed around the room as per the curriculum plan. The playroom is self-contained with a fridge, microwave oven, diaper change table, adult sink, and cubby area. A child size table with chairs and the feeding seats are stored outside the room and brought in as needed. In addition, there is a sleep room adjacent to the playroom. Please refer to Appendix B for a floor plan of the playroom.

Toddler Room

The children spend the majority of the day in a 91.6 square metre (987 sq. ft.) playroom. The environment is set up to meet the needs of the children in the group. This includes a variety of toys and materials and child-size furniture such as tables, chairs, and toy shelves. The playroom is divided into distinct interest areas such as: art, blocks, drama, literacy, and sensory. In addition, there is a washroom area with a diaper change table, child size toilets, and child size sinks. Please refer to Appendix C for a floor plan of the playroom.

Preschool Room

The children spend the majority of the day in a 67.2 square metre (724 sq. ft.) playroom. The environment includes clearly defined interest areas such as: art, blocks, computer, drama, literacy, sensory, and science. The room is equipped with age-appropriate
toys, and materials, and with child-size furniture such as tables, chairs, and toy shelves. In addition, there is a washroom area with child size toilets and sinks. Please refer to Appendix D for a floor plan of the playroom.

**Procedure**

**Introduction**

The data were collected over a period of 3 months from September to December of 1999. Visits to the centres were concurrent but did not occur on the same day. In both centres, the total observation time was 15 hours and there were 275 episodes of social interactions recorded. Specifically, a total of 7.5 hours of documented observations took place in the multi-age grouping resulting in 148 targeted interactions. A total of 7.5 hours of documented observations took place in the conventional age-segregated program resulting in 127 documented interactions.

As a non-participant observer, I documented, in writing, descriptive sequences of the children's interactions. Whenever an interaction occurred, it was recorded in detail until one or both children terminated it. For the purposes of this study, I employed the term interaction to include behavioural events in which a child makes a social bid to another child(ren), whether or not there was an overt response.

Immediately following an observation, the running recording was transcribed and coded according to set categories. The child-to-child interaction checklist was then completed for each observation.
Observations

Multi-age Program

Observations were conducted in one of three multi-age playrooms in the centre. In the present research, the definition of multi-age is the placement of children from birth to 5 years of age, otherwise known as infants, toddlers, and preschoolers together in one group for the majority of the day.

The criteria for choosing one playroom over the others were visibility and hearing. All playrooms are viewed from observation rooms that are equipped with earphones. However, one playroom was set up in such a way that visibility from the observation room was obstructed by the placement of furniture. Another playroom, fully visible, had poor auditory equipment; thus hearing the children proved to be a challenge. The third playroom had full visibility and adequate auditory equipment, thus making this particular room the choice for the study.

Prior to the observations, there were four general visits to the program. These observations provided me with an opportunity to become familiar with the children and the program. I was also given a list of the children’s names and birth dates so that I could note which children were engaged in the interaction.

Observations were scheduled during morning free play between 8:00 a.m. and 10:30 a.m. over various days of the week. Free play is a time in which children may choose to engage in activities that are set up by the educators. This includes access to different interest centres and planned activities. Morning time also includes a snack which children are free to go to when they are ready to eat. In addition, two visits took place over the lunch hour.
between 11:40 a.m. and 12:15 p.m. In total twenty-one visits occurred over various days of the week during a 3-month period, resulting in documentation of 148 targeted interactions. A total of 7.5 hours of documented observations took place. The length of time scheduled for each particular visit varied. The average time however was 70 minutes. I scanned the playroom and when I noticed two or more children initiating or engaging in an interaction they were chosen for observation and their interactions were recorded until terminated by one or both children. An interaction bid was recorded whether or not the initiating child received a response. Any other interaction occurring at this time was not recorded.

**Conventional Age-Segregated Program**

Prior to the observations, there was one general visit to the program. Although I was previously acquainted with the program, this visit provided me with an opportunity to familiarize myself with new children and with any changes made to the program. I was also given a list of the children’s names and birth dates so that I could note which children were engaged in the interaction.

Observations were scheduled during morning age-segregated free play between 9:00 a.m. and 11:30 a.m. over various days of the week. The toddler and preschool educators schedule free play between 10:00 a.m. and 11:00 a.m. whereas the infant educators schedule free play from 9:15 a.m. to 10:00 a.m. and again from 11:00 a.m. to 11:30 a.m. With the exception of one visit to the infant program in the afternoon and a lunchtime observation in the preschool program, all other observations took place within the morning free play period.
As there are no observation booths in this setting, observations took place in the playrooms. I avoided eye contact with children and did not initiate interactions. If children approached me, I responded briefly and neutrally.

Nineteen visits occurred over various days of the week resulting in 127 documented interactions. Specifically there are 12 infant, 51 toddler, and 64 preschool documented interactions. A total of 42 minutes documented observations took place in the infant program, 134 minutes in the toddler program and 291 minutes in the preschool program. The average length of visits was 18 minutes in the infant program, 21 minutes in the toddler program and 23 minutes in the preschool program. Of the nineteen visits, the first five were documented by running records and the remaining 14 visits were video recorded on the suggestion of the centre supervisor.

For the first five visits, I scanned the playroom and when I noticed two or more children initiating or engaging in an interaction they were chosen for observation and their interactions were recorded until terminated by one or both children. An interaction bid was recorded whether or not the initiating child received a response. Any other interaction occurring at this time was not recorded. The videotapes of the remaining 14 visits were analyzed and children’s interactions were documented. Occasionally several interactions occurred in the camera’s field of vision and were taped. In these circumstances, all applicable interactions were examined and documented.
Checklist

I have developed a checklist to record in detail the interactions that occur between children. Part one of the checklist is a modified version of the Multi-age Relationship Observation Protocol (Ryerson, 1999) Section III: Scaffolding and Negotiation developed by Ryerson Polytechnic University and The City of Toronto’s Children’s Services Department. Although, there is a plan to pilot test the checklist in various child care centres, thus far the checklist has only been employed in the multi-age setting.

Part two of the checklist is based on Bodrova and Leong’s (1996) application of Vygotskian principles to early childhood education. The criteria are classified according to leading activities, a term developed by Leont’ev (as cited in Bodrova and Leong, 1996), “to specify the types of interactions between the child and the social environment that lead to developmental accomplishments” (p. 50). Developmental accomplishments are considered “outgrowths of the ‘social situation of development’ that is specific for each age (Vygotsky, 1984). The social situation of development includes both the social context and the way the child reacts to this context” (Bodrova & Leong, 1996, p. 49). See Appendix E for the checklist.
Coding

The running records were coded according to the various headings of the child-to-child interaction checklist. The codes are as follows: receptive of others in play, adaptive behaviour, negotiations, observations and reactions, infants: leading activities, toddlers: leading activities, preschoolers: leading activities, communication, role of peers in shared activity, and other-regulation. The criteria for each code are defined in the checklist (see Appendix E).
Results

Overview

Findings collected from 148 interactions in the multi-age grouping and 127 interactions in the conventional grouping are analyzed. The data is presented in accordance with the following categories: receptive of others in play, adaptive behaviour: to meet the needs of other children, negotiations, observations and reactions, leading activities, communication, role of peers in shared activity, and regulating behaviours of others.

Although it may appear that various components of the categories apply to the multi-age grouping only, there are two exceptions in the conventional program in which younger children could inevitably interact with older children. First, as previously stated, children may be placed in the older age group according to the Day Nurseries Act regulation (1990, Section 55 subsection 2a), which allows 20% of the group to be younger than the required age. Second, children may visit during a set transition period prior to permanent placement in the older age group. To reflect the possibility of these exceptions, in the tables, a dash (--) indicates not applicable, whereas 0 indicates that the behaviour could have, but did not occur in the setting.

It is my intent to discuss the data in an exploratory fashion in order to develop an understanding of the opportunities and affordances that children may encounter when grouped with peers of mixed-ages. Specifically, with each category, I will examine the similarities and differences between the multi-age and conventional child care programs.
Category 1: Receptive of Others in Play

Overview

In this section, I analyze the episodes of children’s being receptive to others in play. Specifically this section is divided into the following sub-categories: offering others toys/materials, assigning others a role to play, and inviting others to join in the play or task.

Offering Others Toys/Materials (O.T.)

Adonia, an infant, is crying. Rose, a preschooler, approaches an educator and asks for Adonia’s soother. Rose returns to Adonia, gives her the soother and then strokes her as she sings “Twinkle Twinkle Little Star”. Adonia ceases her crying. Rose announces to the educator, “She’s not crying. She liked it”.

In the multi-age grouping, a preschool age child offered younger children toys or materials in 14 situations. A toddler offered an infant a toy in 4 incidents. Children offered same-age peers toys or materials on 10 occasions. There were no incidents involving infants offering toys or materials to others.

In comparison, in the conventional setting, there were 4 situations in which infants offered toys to a same-age mate. In the toddler and preschool programs there were 32 incidents of children offering toys or materials to same-age peers. Table 1 displays the breakdown of incidents between children.
Table I

Frequency of Incidences of Children Offering Others Toys or Materials in the Multi-Age and Conventional Programs

<table>
<thead>
<tr>
<th>Initiator/Target</th>
<th>Offering Others Toys/Materials (O.T.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Multi-age</td>
</tr>
<tr>
<td><strong>Infants</strong></td>
<td></td>
</tr>
<tr>
<td>Infant to Infant</td>
<td>0</td>
</tr>
<tr>
<td>Infant to Toddler</td>
<td>0</td>
</tr>
<tr>
<td>Infant to Preschool</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
</tr>
<tr>
<td><strong>Toddlers</strong></td>
<td></td>
</tr>
<tr>
<td>Toddler to Infant</td>
<td>4</td>
</tr>
<tr>
<td>Toddler to Toddler</td>
<td>7</td>
</tr>
<tr>
<td>Toddler to Preschool</td>
<td>2&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
</tr>
<tr>
<td><strong>Preschoolers</strong></td>
<td></td>
</tr>
<tr>
<td>Preschool to Infant</td>
<td>7</td>
</tr>
<tr>
<td>Preschool to Toddler</td>
<td>4</td>
</tr>
<tr>
<td>Preschool to Preschool</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
</tr>
</tbody>
</table>

Note. <sup>a</sup>In the multi-age grouping, one O.T. initiated by a toddler was to a preschool child with special needs.

Assigning Others a Role to Play (A.R.)

In the multi-age grouping, a preschool age child, engaged in dramatic play with two toddlers, assigned each of them roles. Surprisingly, in the conventional setting, there were no situations in which children assigned roles to same-age peers.
Inviting Others to Join in the Play or Task (I.O.)

As expected, infants in both the multi-age and conventional settings did not invite other children to join their play. Similarly, there were no incidents among toddlers in the conventional setting. Conversely, there were 4 occurrences among same-age toddlers in the multi-age grouping. There were also 2 occasions in which toddlers asked older children to join them in play. In addition, there was one incident in which a toddler invited an infant to join his play.

Anoki, a toddler took Tyler an infant by the hand and led him out of the dramatic centre to the toy cash register which was on top of a toy shelf. Tyler reached up to the toy and began to play with it. Anoki took the toy off the shelf and placed it on the floor. Both children manipulated the toy.

In the multi-age grouping, there were 6 situations in which preschoolers invited younger children to join them in play or in a routine (e.g. snack time, going outdoors). There were 2 situations among children in the multi-age grouping, compared to 7 in the conventional setting, in which preschoolers invited same-age mates to join their activity. Table 2 displays the actual number of incidents of children inviting others to join them in a task, play, or routine in both the multi-age and conventional programs.
Table II

Frequency of Inviting Others to Join Them in a Task, Play or Routine in Both the Multi-Age and Conventional Programs

<table>
<thead>
<tr>
<th>Initiator/Target</th>
<th>Inviting Others to Join In (I.O.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Multi-age</td>
</tr>
<tr>
<td><strong>Infants</strong></td>
<td></td>
</tr>
<tr>
<td>Infant/Infant</td>
<td>0</td>
</tr>
<tr>
<td>Infant/Toddler</td>
<td>0</td>
</tr>
<tr>
<td>Infant/Preschool</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
</tr>
<tr>
<td><strong>Toddlers</strong></td>
<td></td>
</tr>
<tr>
<td>Toddler/Infant</td>
<td>1</td>
</tr>
<tr>
<td>Toddler/Toddler</td>
<td>4</td>
</tr>
<tr>
<td>Toddler/Preschool</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
</tr>
<tr>
<td><strong>Preschoolers</strong></td>
<td></td>
</tr>
<tr>
<td>Preschool/Infant</td>
<td>3</td>
</tr>
<tr>
<td>Preschool/Toddler</td>
<td>3</td>
</tr>
<tr>
<td>Preschool/Preschool</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
</tr>
</tbody>
</table>

Category 2: Adaptive Behaviour: To Meet the Needs of Other Children

Savannah, a toddler and Aidan an infant were standing on blocks at the water table. Aidan was watching Savannah as she played with the objects in the water. Aidan fell off the block and then climbed back up. Savannah then proceeded to help Aidan off the block. With the task accomplished, Savannah then hugged Aidan. While hugging, Aidan fell. An adult intervened and helped Aidan get up. Savannah assisted and then walked over to the activity walker. She returned
with it, and the adult placed Aidan in it. Standing to the side of the walker, Savannah hugged Aidan. She then moved to the front of the walker so that she was facing Aidan. She bent down on her knees, picked up a Jack in the Box and played it for him.

Overview

In this section, I analyze the results that are indicative of children adapting their responses verbally or non-verbally to meet the needs of others. Specifically this section is divided into the following sub-categories: modeling tasks step-by-step, offering verbal guidance, offering physical guidance, changing tone of voice, speech, word selection, and changing proximity or gestures.

Modeling Tasks Step-by-Step (M.T.)

As expected there were no incidents whereby infants adapted their responses verbally or non-verbally to meet the needs of same- or mixed-age peers. Similarly, toddlers in the conventional setting did not demonstrate any such behaviours. In contrast, on 2 occasions, toddlers in the multi-age setting provided modeling for the infants.

Preschoolers in the multi-age grouping did not demonstrate any modeling behaviours for same-age mates but did provide modeling for younger peers. Specifically, there were 2 occurrences with infants and one with toddlers. In the conventional setting, there was one incident in which a preschooler requested a same-age mate to watch him as he engaged in play.
Offering Verbal Guidance (V.G.)

In the multi-age grouping, there were 3 occasions in which children provided verbal guidance to their peers. Two episodes occurred between preschoolers. One episode occurred between a toddler and an infant.

Lucas, an infant was sitting in front of a toy shelf. He attempted to stand up. As he stood up his head was perilously close to the underneath of the top shelf. Morgan, a toddler, yelled out "Lucas! Watch your head!" Morgan went to Lucas, bent down, and put his mouth next to Lucas' ear. Morgan then wrapped his arms around Lucas' head.

Offering Physical Guidance (P.G.)

Demitri, an infant, and Bali, a toddler were standing in the observation room situated between the playroom and kitchen. Bali bent over and placed his face close to Demitri's face and then kissed him on the cheek. Demitri stepped back, placed his hand to his mouth and 'blew' Bali a kiss. The cook came out of the kitchen with a food trolley [morning snack which she was taking to the playroom]. The children were in her way. Bali looked at the trolley, then placed one hand on Demitri's arm and using his other hand took Demitri by the hand and walked him out of the way and back to the playroom.

There were 7 such incidents of toddlers offering physical guidance to infants in the multi-age setting. There was one occurrence between toddlers. Preschoolers, on 10 occasions, offered physical guidance to same- and mixed age peers in the multi-age grouping. Conversely, there were no incidents of children offering physical guidance to one another in the conventional setting. As expected, there were no incidents among infants in
both the multi-age and conventional settings. Table 3 displays the specific numbers of occurrences in the multi-age grouping.

Table III

**Frequency of Offering Physical Guidance to Other Children in the Multi-Age Program**

<table>
<thead>
<tr>
<th>Children</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Toddlers</strong></td>
<td></td>
</tr>
<tr>
<td>Toddler to Infant</td>
<td>7</td>
</tr>
<tr>
<td>Toddler to Toddler</td>
<td>1</td>
</tr>
<tr>
<td>Toddler to Preschooler</td>
<td>0</td>
</tr>
<tr>
<td><strong>Preschoolers</strong></td>
<td></td>
</tr>
<tr>
<td>Preschooler to Infant</td>
<td>3</td>
</tr>
<tr>
<td>Preschooler to Toddler</td>
<td>3</td>
</tr>
<tr>
<td>Preschooler to Preschooler</td>
<td>4</td>
</tr>
</tbody>
</table>

**Changing Tone of Voice, Speech Selection, and Word Selection (C.T.)**

There were 3 occurrences of children changing their tone of voice in order to meet the needs of their peer. In particular, in the multi-age program there was one such incident between a toddler and an infant and two occurrences between a preschool child and an infant. In contrast, there were no such experiences in the conventional setting.

**Changing Proximity or Gestures (C.P.)**

In the multi-age grouping there were 12 episodes in which preschoolers adapted their body position or proximity when interacting with infants. Toddlers did so on 7 occasions
when interacting with younger peers and on one occasion when interacting with a same-age mate. Conversely, there were no occurrences in the conventional setting.

Category 3: Negotiations

Two preschoolers, Marcus and Alessandra were playing with the car garage in the block area. An infant, Gianfranco joined their play. Gianfranco attempted to climb the Fisher-Price garage. Alessandra bent down to Gianfranco’s eye level, smiled, and then shook her head. The infant stopped and then attempted to take a car from Marcus who did not react. Alessandra said, “This is yours Gianfranco” and gave him another car. Gianfranco took the car and walked away.

Overview

Various forms of negotiations children employed with peers while engaged in an interaction are analyzed in this section. Specifically, this section is divided into the following sub-categories: working on tasks, deciding roles during play, solving conflicts, asking for assistance, offering assistance, asking for explanations, offering explanations, asking for encouragement, and offering encouragement.

Working on Tasks

In the multi-age grouping, there was one occasion where a preschooler attempted to engage in a negotiation with an infant while working on a task. In comparison, in the conventional preschool program preschoolers negotiated with one another on 16 occasions.
There were 2 incidents in the multi-age grouping involving toddlers engaging in negotiations as compared to no incidents in the conventional grouping.

Solving Conflicts (S.C.)

Attempts to negotiate during a conflict occurred twice between toddlers in the multi-age grouping. In comparison, there were no documented interactions of toddlers in the conventional program attempting to negotiate while solving conflicts.

Preschoolers in the conventional program attempted to negotiate with same-age peers on 4 occasions. Conversely, preschoolers in the multi-age grouping did not engage in negotiations with same-age mates during a conflict, however, there were 4 situations in which preschoolers attempted to negotiate with younger peers. Table 4 displays the frequency of negotiations between same- and mixed-age children in the multi-age grouping.

Table IV
Frequency of Negotiations While Solving Conflicts between Same- and Mixed-Age Children in the Multi-Age Grouping.

<table>
<thead>
<tr>
<th>Children</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Toddlers</strong></td>
<td></td>
</tr>
<tr>
<td>Toddler to Infant</td>
<td>0</td>
</tr>
<tr>
<td>Toddler to Toddler</td>
<td>2</td>
</tr>
<tr>
<td>Toddler to Preschooler</td>
<td>0</td>
</tr>
</tbody>
</table>

**Preschoolers**

<table>
<thead>
<tr>
<th>Children</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preschooler to Infant</td>
<td>1</td>
</tr>
<tr>
<td>Preschooler to Toddler</td>
<td>3</td>
</tr>
<tr>
<td>Preschooler to Preschooler</td>
<td>0</td>
</tr>
</tbody>
</table>
Offering Assistance (O.A.)

In total, there was one incident that involved a toddler offering assistance to a preschool child during a conflict and 2 occasions in which preschoolers offered assistance to younger and same-age children. In comparison, there was one situation in which a preschooler offered assistance to a same-age mate in the conventional program.

Asking for Explanations (A.EX.)

In the multi-age grouping, a preschool child asked for an explanation from a same-age peer on one occasion. Similarly, there was only one situation between preschool children in the conventional program.

Offering Explanations (O.EX.)

André, a preschooler approached Dustin an infant who was standing at the water table. André placed his hand on Dustin’s back and pushed him down. Michael, also a preschooler, intervened, and as he stood by Dustin, explained to André “It’s a baby.” André kicked a toy and left.

In the multi-age grouping toddlers attempted to offer an explanation on 9 occasions during negotiations with younger, same-age, and older children. Similarly, preschoolers in the multi-age groupings attempted to offer an explanation on 8 occasions during negotiations with younger, same-age, and older children. Table 5 displays the number of explanations children offered same- and mixed-age peers in the multi-age and conventional programs.
Table V

**Frequency of Offering Explanations to Others in the Multi-Age and Conventional Programs**

<table>
<thead>
<tr>
<th>Initiator/Target</th>
<th>Offering Explanations to Others (O. EX.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Multi-age</td>
</tr>
<tr>
<td><strong>Toddler</strong></td>
<td></td>
</tr>
<tr>
<td>Toddler/Infant</td>
<td>1</td>
</tr>
<tr>
<td>Toddler/Toddler</td>
<td>6</td>
</tr>
<tr>
<td>Toddler/Preschool</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
</tr>
<tr>
<td><strong>Preschooler</strong></td>
<td></td>
</tr>
<tr>
<td>Preschool/Infant</td>
<td>1</td>
</tr>
<tr>
<td>Preschool/Toddler</td>
<td>2</td>
</tr>
<tr>
<td>Preschool/Preschool</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
</tr>
</tbody>
</table>

With the exception of one occurrence in which a preschool child asked for assistance from a same-age peer in the conventional program, there were no occurrences in the following sub-categories: deciding roles during play, asking for encouragement, and offering encouragement. Furthermore, infants and toddlers in the conventional program did not engage in negotiations with others.
Category 4: Observations and Reactions

Overview

Behaviours of younger children observing and responding to other children involved in the program are analyzed in this section. Specifically, this section is divided into the following sub-categories: continuing to watch, moving closer, joining in the play or task, and acting on the observation later.

Continuing To Watch (C.W.)

There were 33 situations in the multi-age grouping whereby children observed older children at play or working on a task. In the conventional program, there were two occasions when infants watched their older peers at play. There were no occurrences of toddlers in the preschool program observing older children. Table 6 displays the frequency and break down of age of younger children observing older peers in both the multi-age and conventional programs.

Table VI

Frequency of Younger Children Watching Older Peers at Play or at a Task in the Multi-Age Program

<table>
<thead>
<tr>
<th>Observer/Model</th>
<th>Younger Children Continuing to Watch Older Children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Multi-age</td>
</tr>
<tr>
<td>Infant/Toddler</td>
<td>10</td>
</tr>
<tr>
<td>Infant/Preschool</td>
<td>12</td>
</tr>
<tr>
<td>Infant/Toddler/Preschool</td>
<td>6</td>
</tr>
<tr>
<td>Toddler/Preschool</td>
<td>3</td>
</tr>
</tbody>
</table>
Moving Closer (M.C.)

In the multi-age grouping there were 3 occasions in which infants observing toddlers at play or working on a task moved in closer to the activity. There were no similar occurrences with toddlers observing preschool children and moving closer to the activity area in the multi-age grouping. Similarly, in the conventional program, there were no occurrences of children observing older children and moving in closer to the activity.

Joining In the Play/Task (J.I.)

In the multi-age grouping, there were 27 occurrences of younger children joining the play of older peers. With the exception of one incident, children were welcomed into the play. The exception was a toddler attempting to join the play of a preschool child.

In comparison, in the conventional program there was one incident in which an infant visiting the toddler program observed an older child and then joined in the play. In the preschool room, there were 7 occurrences of toddlers observing preschool children and attempting to join their play. However, on three of those occasions, the preschool children rejected the toddlers. Table 7 displays the frequency of children joining in the play of older children.
Table VII
Frequency of Younger Children Joining in the Play or Task of Older Children in the Multi-Age Program

<table>
<thead>
<tr>
<th>Younger/Older</th>
<th>Joining In the Play/Task (J.I.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Multi-age</td>
</tr>
<tr>
<td>Infant/Toddler</td>
<td>7</td>
</tr>
<tr>
<td>Infant/Preschool</td>
<td>6</td>
</tr>
<tr>
<td>Infant/Toddler/Preschool</td>
<td>1</td>
</tr>
<tr>
<td>Toddler/Preschool</td>
<td>13&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Note. <sup>a</sup> One J.I. initiated by a toddler was rejected by the preschool child.
<sup>b</sup> Three J.I. initiated by a toddler was rejected by the preschool child(ren).

Acting on Observation Later (A.L.)

_The children were sitting in a circle singing a song with the Early Childhood Educator (ECE). Madison, an infant observes Benjamin, a toddler, running from the circle area to the block area and throwing himself on the pillows. The ECE intervened and asked Benjamin to stop running. Benjamin returns to the circle. Madison crawls around the shelf dividing the block area from the circle area. She stood up, went to the pillows and threw herself onto them._

This vignette describes the only incident in the multi-age grouping in which a younger child observed an older peer engaged in a task or at play and then imitated the behaviour. There were no incidents in the conventional program.
Category 5: Infants: Leading Activity - Emotional Communication

Overview

For the purpose of this study, infants engaged in leading activities were documented only when the incident involved another child. As expected, by virtue of the age-segregation in a conventional program opportunities were not available for infants to engage in leading activities with other children.

This section is divided into the following nine sub-categories:

- emotional exchanges-verbal, emotional
- exchanges-physical
- emotional dialogue infant smiles after manipulation object
- emotional dialogue- infant initiates interaction
- dialogue related to objects or actions
- objects are labeled and talked about
- infant’s actions are interpreted
- object-oriented sensorimotor actions
  (such as peer models what to do with an object, peer uses words to focus infant on separate objects and attributes)
- peer provides assistance

Kioko, a preschool child, holding a rattle, knelt down in front of Valentina, an infant, sitting in an activity walker. Kioko shook the rattle in front of Valentina’s face. Valentina looked at the rattle. Kioko then shook the rattle to one side of Valentina’s head. Valentina turned her head toward the sound. Kioko then moved the rattle to the other side of Valentina’s head and shook it. Valentina once again tracked the sound and moved her head toward the sound. Kioko repeated the action on the other side of Valentina’s head. Again Valentina tracked the sound and moved her head toward the sound. Kioko then looked into Valentina’s face, smiled, placed the rattle on the walker’s tray, and walked away.
In the multi-age program, infants engaged in a leading activity with older children on 106 occasions. Specifically, there were 56 occurrences with toddlers, 48 occurrences with preschoolers, and 2 occurrences with a combined group of toddlers and preschool children.

Table 8 sets out the criteria and shows the frequency within the specific age groups.

Table VIII
Frequency of Infants in Leading Activities with Older Children in the Multi-Age Grouping

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Infant with Toddler</th>
<th>Infant with Preschooler</th>
<th>Infant with Toddler and Preschooler</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional exchange verbal</td>
<td>4</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Emotional exchange physical</td>
<td>15</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>Emotional dialogue-infant smiles after manipulating object</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Emotional dialogue-infant initiates interaction</td>
<td>7</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Dialogue related to objects or actions</td>
<td>4</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Objects are labeled and talked about</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Infant’s actions are interpreted</td>
<td>7</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Object-oriented sensorimotor actions</td>
<td>8</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Peer provides assistance</td>
<td>6</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>
Category 6: Toddlers: Leading Activity - Manipulation of Objects

Overview

Results from documented observations of toddlers engaging in a leading activity with a younger, same, or older peer are analyzed. Specifically, this section is divided into the following sub-categories: interacts with objects, instrumental activity, child uses language that is tied to object manipulation, child labels objects, and uses accordingly and independent behaviour.

In the multi-age grouping, there were 98 occurrences in which toddlers engaged in leading activities with younger, same-age, and older peers. Table 9 sets out the criteria and shows the break down of occurrences within the specific age groups.

Table IX

Frequency of Toddlers in Leading Activities with Younger, Same-age, and Older Children in the Multi-Age Grouping

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Younger</th>
<th>Same-Age</th>
<th>Older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interacts with objects</td>
<td>8</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>Instrumental Activity</td>
<td>2</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Language is tied to Object Manipulation</td>
<td>1</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Objects Labeled and Child Uses Accordingly</td>
<td>1</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Independent Behaviour-opposing will of others</td>
<td>1</td>
<td>9</td>
<td>7</td>
</tr>
</tbody>
</table>
In the conventional program, toddlers engaged in leading activities with younger, same, and older peers on 76 occasions. Table 10 sets out the criteria and shows the breakdown of occurrences within the age-segregated groupings.

Table X

**Frequency of Toddlers in Leading Activities with Younger, Same-age, and Older Children in Age-Segregated Groupings within the Conventional Program**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Younger</th>
<th>Same-Age</th>
<th>Older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interacts with objects</td>
<td>0</td>
<td>21</td>
<td>4</td>
</tr>
<tr>
<td>Instrumental Activity</td>
<td>1</td>
<td>19</td>
<td>3</td>
</tr>
<tr>
<td>Language is tied to Object Manipulation</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Objects Labeled and Child Uses Accordingly</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Independent Behaviour</td>
<td>0</td>
<td>20</td>
<td>2</td>
</tr>
</tbody>
</table>

**Infants and Preschoolers Engaging in Toddler Leading Activities**

In the multi-age grouping, an infant opposed the will of a preschool child on one occasion. Similarly, in the conventional program an infant enrolled in the toddler program as an “underage child” opposed the will of a toddler on one occasion.

In both the multi-age and conventional programs, there were occurrences in which preschool children engaged in toddler leading activities with infants or same-age mates. Preschool children in the multi-age grouping engaged in such activities with same-age peers on 3 occasions. In contrast, in the age-segregated grouping, preschoolers engaged in toddler leading activities with same-age peers on 14 occasions. Table 11 displays the criteria and the
break down of occurrences in which preschoolers in the multi-age and conventional programs engaged in leading activities with infants and with same-age mates.

Table XI

Frequency of Preschoolers in Toddler Leading Activities with Infants and Same-age Mates in the Multi-age and Conventional Programs

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Multi-age</th>
<th>Conventional</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Infant</td>
<td>Same-age</td>
</tr>
<tr>
<td>Interacts with objects</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Instrumental Activity</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Language is tied to Object Manipulation</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Objects Labeled and Child Uses Accordingly</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Independent Behaviour-opposing will of other</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Category 7: Preschoolers: Leading Activity – Play

Preschool children in the multi-age program engaged in a play situation with same-age peers on 7 occasions. There were also 12 occurrences of preschoolers engaging in play with toddlers. In contrast, preschoolers in the conventional program engaged in play with same-age peers on 35 occasions. In addition, there were 4 occurrences of toddlers engaged in play with their older counterparts. On one occasion, two preschool children were involved in a play situation with a kindergarten child who was visiting the program for the morning.
Toddlers Engaging in Preschool Leading Activity

In the multi-age program, there were 6 occurrences in which toddlers engaged in play with same-age peers. Conversely, there were no such occurrences in the age-segregated toddler grouping in the conventional program.

Category 8: Communication

Overview

Results of social interactions between children of same- or mixed-ages are presented in this section. The interactions are classified as either positive or negative. As previously stated, observable positive interactions include prosocial behaviours adapted from Furman, Rahe, and Hartup’s (1979) study. Observable negative interactions include behaviours adapted from Goldman’s (1981) study. Detailed descriptions of the behaviours are presented in the Present Study section. In addition, the interactions are coded to indicate the Initiator (child initiating the social bid) and the Recipient (child who is the target of the social bid).

Multi-age Grouping

In the multi-age grouping, there were 85 positive and 14 negative interactions initiated by older children toward younger peers. Interestingly, of the negative behaviours exhibited toward younger children, only 2 such incidents occurred between a preschooler and an infant. Table 12 details the interactions between the children.
Table XII

Frequency of Positive and Negative Interactions Initiated by Older Children toward Younger Peers in the Multi-age Grouping

<table>
<thead>
<tr>
<th>Initiator/Recipient</th>
<th>Positive Interaction</th>
<th>Negative Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toddler/Infant</td>
<td>32</td>
<td>5</td>
</tr>
<tr>
<td>Preschool/Infant</td>
<td>30</td>
<td>2</td>
</tr>
<tr>
<td>Preschool/Toddler</td>
<td>23</td>
<td>7</td>
</tr>
</tbody>
</table>

Younger children in the multi-age grouping initiated 32 interactions with older children. Specifically of those 32 interactions, 20 were positive and 12 were negative. Table 13 details the interactions between the children.

Table XIII

Frequency of Positive and Negative Interactions Initiated by Younger Children toward Older Peers in the Multi-age Grouping

<table>
<thead>
<tr>
<th>Initiator/Recipient</th>
<th>Positive Interaction</th>
<th>Negative Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant/Toddler</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Infant/Preschool</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Toddler/Preschool</td>
<td>18</td>
<td>10</td>
</tr>
</tbody>
</table>

There were 61 interactions between same-age mates. Specifically, there were 41 positive and 20 negative interactions. Table 14 details the interactions between same-age children.
Table XIV

Frequency of Positive and Negative Interactions between Same-age Children in the Multi-age Grouping

<table>
<thead>
<tr>
<th>Initiator/Recipient</th>
<th>Positive Interaction</th>
<th>Negative Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant/Infant</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Toddler/Toddler</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td>Preschool/Preschool</td>
<td>20</td>
<td>1</td>
</tr>
</tbody>
</table>

Conventional Program

In the conventional program, there were 4 positive and 14 negative interactions initiated by older children toward younger peers. Table 15 details the interactions between the children.

Table XV

Frequency of Positive and Negative Interactions Initiated by Older Children toward Younger Peers in the Conventional Program

<table>
<thead>
<tr>
<th>Initiator/Recipient</th>
<th>Positive Interaction</th>
<th>Negative Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toddler/Infant</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Preschool/Infant</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Preschool/Toddler</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Kindergarten/Preschool(^a)</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

*Note.* ^a^ During one observation, a Kindergarten child visited the preschool program for the morning.
Younger children in the conventional program initiated 8 interactions with older children. Specifically of those 8 interactions, 4 were positive and 4 were negative. Table 16 details the interactions between the children.

Table XVI

**Frequency of Positive and Negative Interactions Initiated by Younger Children toward Older Peers in the Conventional Program**

<table>
<thead>
<tr>
<th>Initiator/Recipient</th>
<th>Positive Interaction</th>
<th>Negative Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant/Toddler</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Infant/Preschool</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Toddler/Preschool</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Preschool/Kindergartena</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

*Note.* aDuring one observation, a Kindergarten child visited the preschool program for the morning.

In the conventional program, there were 139 interactions between same-age mates. Specifically there were 73 positive and 66 negative interactions. Table 17 details the interactions between the children.

Table XVII

**Frequency of Positive and Negative Interactions between Same-age Children in the Conventional Program**

<table>
<thead>
<tr>
<th>Initiator/Recipient</th>
<th>Positive Interaction</th>
<th>Negative Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant/Infant</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Toddler/Toddler</td>
<td>23</td>
<td>37</td>
</tr>
<tr>
<td>Preschool/Preschool</td>
<td>40</td>
<td>22</td>
</tr>
</tbody>
</table>

62
Category 9: Roles of Peers in Shared Activity

Overview

In this section, I examine the roles children assumed while engaging in a shared activity with peers. Specifically, this section is divided into the following sub-categories: co-operating to successfully complete a task, assuming assigned roles, acting as a sounding board for a peer, acting for an imaginary person, acting as the expert or the novice, and creating cognitive conflict.

Co-operating to Successfully Complete a Task

In the multi-age grouping, there were 10 occurrences of dyads or triads of children co-operating to successfully complete a task. In comparison, in the conventional program only preschoolers interacting with same-age peers co-operated to successfully complete a task. Table 18 details the age composition of the children and the frequency of occurrences.

Table XVIII
Age Composition of Children and Frequency of Occurrences of Children Co-operating to Successfully Complete a Task in the Multi-age and Conventional Programs

<table>
<thead>
<tr>
<th>Age Composition</th>
<th>Multi-age</th>
<th>Conventional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toddlers Only</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Preschoolers Only</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Toddler/Preschool</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>
Assuming Assigned Roles

While engaged in a shared activity with a younger, same, or older age peer, children at times assumed an assigned role. The child appropriated the role through assignment from a peer or by ascribing it to oneself.

In the multi-age grouping, preschoolers assumed an assigned role with same-age peers on 2 occasions. In addition, there was one occurrence in which a preschooler assumed an assigned role while in a shared activity with a toddler. In comparison, preschool children in the conventional program assumed assigned roles with same-age peers in 6 situations.

Acting as the Expert or the Novice

As a result of engaging in a shared activity with an infant, toddlers had the opportunity to take on the role of the expert on 6 occasions. Similarly, preschool children engaged in a shared activity with an infant were afforded the opportunity to take on the role of the expert on 5 occasions. In addition, preschool children also took on the role of the expert with toddlers on 3 occasions. There were no documented observations of same-age peers taking on the role of the expert or novice. In all documented observations, the child in the role of the expert initiated the interaction.

In the conventional program, there was one situation in which a preschool child engaged in a shared activity with a same-age peer took on the role of the expert. In addition, there was one occurrence of a preschool child engaged in a shared activity with a same-age peer who, through asking for assistance, took on the role of the novice.
Creating Cognitive Conflict (C.C.)

In the multi-age grouping, children engaged in a shared activity with others demonstrated cognitive conflict in 5 situations. In the conventional program, there were 9 situations in which cognitive conflict was notable in preschool children interacting with same-age mates. Table 19 details the age composition and frequency in both the multi-age and conventional programs.

Table XIX
Age Composition of Children and Frequency of Cognitive Conflict between Children in a Shared Activity in the Multi-age and Conventional Programs

<table>
<thead>
<tr>
<th>Age Composition</th>
<th>Multi-age</th>
<th>Conventional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toddlers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toddler &amp; Infant</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Toddler &amp; Toddler</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Toddler &amp; Preschool</td>
<td>1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Preschoolers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preschool &amp; Infant</td>
<td>2</td>
<td>--</td>
</tr>
<tr>
<td>Preschool &amp; Toddler</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Preschool &amp; Preschool</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>9</td>
</tr>
</tbody>
</table>

Note. <sup>a</sup>Toddler demonstrated C.C. when interacting with a preschool child with special needs.
There were no occurrences in the following two sub-categories: child acting as a sounding board for a peer and child acting for an imaginary person. Furthermore, there were no observable behaviours that demonstrated that toddlers in the age-segregated conventional program engaged in cognitive conflict while in a shared activity with peers.

**Category 10: Regulating Behaviours of Others**

*Jacob, a toddler was running in the playroom in circles. Upon approaching a toy he knelt down like a frog and leaped over it. Nicolette, a preschool child imitated him. An adult intervened and said "Nicolette, no running, we run outside." Nicolette ignored the adult and continued to run. Jacob ran to catch up with Nicolette. He put his arm around her shoulder and said, "Nicolette no running." They both walked into the block area.*

Children in the multi-age grouping attempted to regulate the behaviours of younger, same, and older peers in 25 situations. In the conventional program, there were 12 occurrences of children attempting to regulate the behaviours of same-age peers. Table 20 details the initiator/target and the frequency of the behaviour.
### Table XX

**Frequency of Children Attempting to Regulate the Behaviours of Younger, Same, or Older Peers in the Multi-age and Conventional Programs**

<table>
<thead>
<tr>
<th>Initiator/Target</th>
<th>Multi-age</th>
<th>Conventional</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Infants</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infant/Infant</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Infant/Toddler</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Infant/Preschool</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td><strong>Toddlers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toddler/Infant</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Toddler/Toddler</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Toddler/Preschool</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td><strong>Preschoolers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preschool/Infant</td>
<td>6</td>
<td>--</td>
</tr>
<tr>
<td>Preschool/Toddler</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Preschool/Preschool</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>11</td>
</tr>
</tbody>
</table>
Discussion

Overview

Determining what affordances (Berger, 1998) and opportunities a multi-age child care model, as compared to a conventional age-segregated model, offers children when infants, toddlers, and preschoolers are grouped together in a program was the research objective of the present research. Distinctive in its exploratory examination of children’s social interactions within their natural environment of a multi-age compared to a conventional age-segregated child care setting, this study presents results which lend support for multi-age groupings as a viable alternative to traditional forms of licensed child care centres.

The categories used to organize the results might further be grouped into two social based themes; interactions and play. Thus, the theme *interactions* will incorporate the following categories: adaptive behaviour, negotiations, observations and reactions, communication, and regulating the behaviours of others. The theme *play* will incorporate the following categories: receptive of others in play, leading activities, and role of peers in shared activity.
Interactions

Elijah an infant, was sitting on the Educator's lap. Nadia a toddler, was standing next to them. Elijah touched Nadia's nose. Nadia laughed and kissed him on the head.

Overview

This investigation illuminates the value of children's interactions with younger, same, and older peers. Overall, the results reflect the findings of Evangelou (1989), McClellan (1993), and McClellan & Kinsey (1996) who suggest that the multi-age grouping affords children more opportunities to engage in prosocial behaviours and that in effect children tend to display prosocial behaviours when mixed with children of varying ages. As previously stated this theme embodies the following categories: adaptive behaviour, negotiations, observations and reactions, communication, and regulating the behaviours of others.

One morning Amy a toddler, arrived at child care with her mother and baby sister. When her mother informed Amy that she was leaving, Amy began to cry. Cole a toddler, ran from across the room toward her saying, "Amy, Amy." Standing beside her, he distracted her by pointing to Amy's baby sister and saying, "baby". Amy stopped crying.
Ada~tive Behaviour

In the multi-age grouping, children were observed to offer both verbal and physical guidance to younger, same, and older age mates. Conversely, no such behaviours were observed in the conventional setting.

Christopher, an infant was sitting in the high chair eating lunch. Daniel, a toddler, was standing to the side of the high chair. Daniel fed Christopher a piece of toast and watched as he chewed the food. When Christopher finished chewing, Daniel gave him another piece of toast. While Christopher chewed his food, Daniel picked up another piece of toast and while holding it walked to the block centre. He immediately turned around, walked back to Christopher and fed him the piece of toast. Daniel then walked away.

There were occasions when older children had the opportunity to assist their younger friends. Children in multi-age groupings may be afforded these opportunities because they are grouped with infants and young toddlers who at times need assistance with self-help skills. When compared to conventional programs, how often do circumstances arise in age-segregated groupings that give preschoolers or toddlers a chance to interact with the younger children and assist with them with an activity, self-help skills or with a care giving routine?

Sitting at an art activity, Michelle, a toddler was having difficulties manipulating the scissors. Donna, a prescholer observed this and offered to help. Donna assisted Michelle by cutting the paper. Task completed, Donna left the activity.
One may argue that older children can interact with younger children in the age-segregated programs by visiting the program. Although this may occur, the relationships in a multi-age grouping, as compared to a conventional setting, may be stronger given that the children are interacting on a daily basis. Children in one age-segregated grouping may not be acquainted with children in another, thus setting up an artificial encounter when placed together rather than a natural interaction of an older child wanting to help their younger friend.

Whereas children in the age-segregated groupings were not observed changing their body position to meet the needs of their peers, toddlers and preschoolers in the multi-age grouping when interacting with the infants, would change their body position or use gestures to meet the needs of their peer. Understanding the necessity for this may come from the frequent interactions with the younger children. In addition, the children have the Educators as role models who would assist them in their interactions with younger children and at times would hold discussions about the appropriate way of interacting with infants. In particular, on one occasion, an Educator talked to the toddlers and preschoolers about the acceptable way of retrieving a toy if an infant took it from them. She emphasized offering the infant another toy in place of the one that the child was attempting to get back. In addition, older children may naturally model appropriate interactions to their younger peers, especially when mixed-age dyads and triads are interacting with an infant.

*Samantha, a preschooler, was in the block area playing with the doll house and its toy furniture and people. Aaron, an infant, crawled over to the doll house and took the baby carriage. Samantha said, “No Aaron”. She put her hand out toward Aaron to take back the baby carriage but abruptly stopped her hand near Aaron and then held it out and waited*
for the toy. She then picked up a doll from the doll house and tried to give it to Aaron. He ignored the offering. Samantha then held the doll in front of Aaron's face. He turned and walked away. Samantha, toy in hand, followed him. Aaron dropped the baby carriage, bent over and picked it up. He then returned to the doll house. He sat down and put the doll carriage on the carpet near the doll house. Samantha sat next to him.

Negotiations

Overall, the results of this study demonstrate that experiences in negotiating with peers may differ between multi-age and age-segregated programs. The question arises regarding the need for negotiations when children are within a multi-age grouping. Are interaction patterns different between the two groupings and how do these patterns influence the need to negotiate? Interestingly, toddlers in the multi-age grouping engaged in negotiations with same- and older-age peers. Based on the available literature regarding pairing toddlers with preschoolers in play, toddlers tend to demonstrate more complex forms of play (Howes & Farver, 1987, Katz, Evangelou & Hartman, 1990). Hence, by being in an environment where toddlers are interacting with older children on a daily basis, they may be learning negotiation skills.

Observations and Reactions

Younger children in the multi-age grouping were afforded numerous opportunities to observe older children in play or working on tasks. These opportunities may be particular to multi-age groupings by virtue of the fact that children in age-segregated groupings are primarily engaged in similar activities and encouraged to take part in the planned program. Moreover, toys and materials are used in ways that are appropriate for the age group whereas
in the multi-age grouping toys and materials are being used ways in more complex ways. Thus, infants in the multi-age grouping are enticed into situations that do not occur in conventional programs. For example, on a number of occasions infants observed children dancing and playing musical instruments, building a tower of blocks or making a train with the chairs. It seems reasonable to suggest that their counterparts in age-segregated programs, although stimulated by the educators, are not afforded the opportunities to watch others at play, particularly the more complex levels of play.

Children in the multi-age program welcomed younger children into their play. The notion that multi-age groupings have fewer cases of children being rejected is supported by McClellan & Kinsey (1986, p.1) who argue that fewer children in a mixed-age classroom were rejected. On the one occasion that a toddler was not welcomed, the preschool child involved in the interaction offered the child another toy. Surprisingly, toddlers who were visiting or placed early in the age-segregated preschool program were rejected three out of seven attempts to join the older children in play.

It is probable that familiarity may be a factor. In the multi-age grouping, children may be together for the first 4 to 5 years of their life ensuring the child familiarity with their peers. By contrast, in the conventional program children must go through a transition period of becoming familiar with new educators, surroundings, rules and expectations, and children. Children already in the group may not be as readily welcoming to others who are new to the group or are perceived by the older children to be “babies”. This supports Berk and Winsler (1995) who argue for continuity of care in the early years. The results of this study suggest that one of the benefits of multi-age groupings may be the positive reactions that await younger children when joining the activity of older peers.
Communication

Joel, an infant walked over to the art table. He picked up a glue stick and put it to his mouth. Tabitha, a toddler noticed. She went to an adult and said, "Joel eating glue stick". The adult intervened.

Safety is a controversial issue regarding the placement of infants with toddlers and preschoolers in one group. The present analysis does not support the concern that infants are at a safety risk in a multi-age grouping. Of the 32 interactions between preschoolers and infants, only two of the interactions involved the older child pushing an infant (see Table 12). Interestingly, a child who was new to the program initiated the two negative interactions. This may suggest that a child who enrolls in the program at a later age may need guidance by the educators when interacting with younger peers, particularly if the child has had limited exposure to other children. Furthermore, of the 37 interactions initiated by toddlers toward infants, 32 were considered positive (see Table 12). Surprisingly, even toddlers who are known to engage in negative behaviours such as biting and hitting exhibited prosocial behaviours toward their younger peers.

In my experience, when the topic of multi-age models arises, some individuals express concern about infant safety in the program. In my observations, I found no evidence that mixed-age groupings put the infants in peril. The results of this case study, albeit limited, suggests that in a quality multi-age grouping, infants may be safe when interacting with older children.
It is particularly interesting that in the multi-age grouping, toddlers in same-age dyads or triads demonstrated behaviours reflective of those typical of the toddler stage. As previously stated, some of the interaction differences found between toddlers in same-age and multi-age groupings may be attributable to familiarity with one another and experiences with younger peers. However, these observations do raise more general questions regarding toddler behaviour within a group setting. First, do multi-age settings affect the behaviours of toddlers with same-age peers? Second, why do toddlers seem to demonstrate prosocial behaviours toward younger peers but not to same age-mates? Third, is group size a factor, and if so then what would be the optimal number of toddlers within a multi-age grouping?

Toddlers’ experiences with older peers may differ between multi-age and age-segregated groupings. Toddlers in the multi-age grouping were observed to engage in more positive interactions with preschool children. These observations are congruent with Brownwell’s (1990) research, which suggests that when paired with older children, toddlers tend to be more interactive and social. By contrast, those toddlers in the age-segregated program who were either visiting the preschool room or were enrolled as “underage” were either ignored or rebuffed by the older children.

*Jonah, a preschooler and Katherine, a toddler were standing together in the book area. Jonah had a puzzle piece on one hand. He placed both hands behind his back and asked Katherine to choose a hand. If she chose the hand with the puzzle piece Jonah would switch it to the other hand and show Katherine the empty hand. Katherine would then guess again. This guessing game was repeated twice. Katherine’s attention was then diverted to an object on the floor. When she bent over to get the object, Jonah placed the puzzle piece on her head. Katherine felt her hair and took the puzzle piece. She laughed and walked away.*
Results of this study also suggest that interaction patterns between same-age preschool children in a multi-age grouping may differ from children in age-segregated programs. Surprisingly, preschool age children within the multi-age grouping engaged in one negative interaction. These results lend support to research that suggests that multi-age groupings encourage co-operation (Elkind, 1987), and acceptance of others (Katz, 1995).

Regulating the Behaviour of Others

_The children gathered for group time with the Educator. Matthew, an infant, was standing in the block area at the toy shelf watching the children in the circle. Peter, a preschooler, approached Matthew and attempted to take him by the hand towards the group of children. Matthew shrugged Peter away, conveying the message that he did not want to go with him. Peter went back to the group and informed the Educator that Peter did not want to go to circle. The Educator told Peter that it was okay that Matthew did not go to circle. Peter returned to Matthew, whispered in his ear and went back to sit in the circle of children._

In their interactions, children in licensed centre-based settings are often observed regulating the behaviours of others. Vygotskians support the notion that _other-regulation_ is the precursor to self-regulation (Bodrova & Leong, 1996). In the conventional program preschoolers engaged in _other-regulation_ with same-age mates. However, in the multi-age grouping, children have opportunities to regulate the behaviours of children of varying ages. It is particularly interesting that toddlers and preschoolers both attempted to regulate the behaviours of infants. Notwithstanding the importance of regulating the behaviours of same-age mates, the reactions of younger or older children may afford children learning opportunities that differ from reactions of same-age peers. In addition, there may be more
opportunities for children to engage in other-regulation when placed in a multi-age grouping. “Learning to be the regulator and the object of regulation is important for the development of higher mental functions” (Leont’ev, 1978; Vygotsky, 1983 as cited in Bodrova & Leong, 1996). This particular aspect is worthy of further study.

Rico was sitting in the high chair drinking his bottle. An Educator (new to the program) started to take him out of the chair. Constantine, a preschooler said to the Educator, “Rico needs to drink it up in his high chair.” The Educator conferred with a colleague who confirmed what Constantine had said.

How other-regulation affects the older children’s development of self-regulation is an important question to investigate as it may have implications for practice. It seems reasonable to suggest that educators can place children in a position to regulate the behaviours of others or guide older children when regulating the behaviours of younger peers.

Play

Overview

This investigation illustrates the affordances offered to children through play with younger, same, and older peers. Overall, the results support the findings of previous studies (Howes & Farver, 1987; Katz, Evangelou, & Hartman, 1990; Mounts & Roopnarine, 1987) that suggest that the multi-age grouping affords children more opportunities to engage in more complex and interactive levels of play. As noted in the introduction, the theme ‘play’ is
composed of the following categories: receptive of others in play, leading activities, and role of peers in shared activity.

Receptive of Others in Play

In both the multi-age and conventional settings, children demonstrated receptiveness toward their peers. However, in the multi-age setting, children were observed being receptive to others in play with same- and mixed-age peers. I observed with great interest a pumpkin carving activity in which a toddler attempted to include a preschool child with special needs.

A group of toddlers and preschoolers were sitting at a table assisting with the carving of a pumpkin. Nathaniel, a toddler, was helping to scoop seeds out of the pumpkin and placing them in a dish. Nathaniel, with pumpkin seeds in his hand, stood up and walked to the other side of the table and stood near Luke. Luke, a child with special needs was sitting on his mother's lap. Nathaniel touched Luke's arm. He then took Luke's hand and together they touched the seeds. Nathaniel then gave the seeds to Luke's mother.

It is important to note that given the diversity of ages within a multi-age setting, children with special needs may not stand out as "different" from others. This warrants further investigation as it may hold implications for inclusion of children with special needs within group care settings.

Interestingly, toddlers in the multi-age grouping were observed inviting same- and mixed age children to join them in play. It is in marked contrast to toddlers in the age-segregated program that did not engage in such behaviour. The question arises; if toddlers are
consistently grouped with older children, can they sustain more complex levels of play and transfer the skills to same-and younger-age mates? In addition, is it practically feasible to expect Educators in age-segregated programs to provide toddlers with the same play opportunities as their counterparts in multi-age groupings?

Leading Activities

1. Infants: Emotional Communication

*Ricky, an infant, was crawling across the playroom floor. Dawn, a preschooler, attempted to pick him up. Not successful she followed him to the sensory table (a plastic tub with cereal in it for play). Ricky stood up at the side of the sensory table. Dawn put cereal onto a spoon and imitating an airplane flew it over Ricky's head. In a high pitched voice she exclaimed, "here's your pasta!" Ricky laughed. Dawn repeated this action several times.*

As stated in the presentation of the results, this category pertains to infants in the multi-age groupings as observations were noted only if the infant was engaged in emotional communication with another child. Caution must be exercised in order not to infer that infants in an age-segregated setting do not have opportunities to engage in emotional communication. Infants in same-age groupings need to rely primarily on adults compared to infants in multi-age groupings who have opportunities to engage in emotional communication with adults and older peers.
Overall, the findings suggest that older children pay attention to the infants in a safe and loving manner. Older children engaged in emotional exchanges both verbally and physically (e.g. smiling, hugging, kissing, touching). In addition, both toddlers and preschoolers attempted to interpret the infants’ actions and at times assisted the infants. Older children demonstrated behaviours that are considered appropriate when interacting with infants.

*Lidia, a preschooler, arrived at child care one morning and went directly to Paul, an infant, who was standing at a table. Lidia sat down, engaged Paul in eye to eye contact and smiled at him. Paul played with Lidia’s hair. Lidia smiled at Paul and moved her head back and forth so that her hair moved. Paul continued to touch Lidia’s hair. All the while, Lidia smiled and spoke to Paul.*

2. Toddlers: Manipulation of Objects

As expected both toddlers in multi-age and conventional programs engaged in leading activities. During play episodes, toddlers in the multi-age grouping were involved in both same- and mixed age groups. Critical to these results is the affordances available to infants when participating in play with older children. Given the results of previous studies indicating the increased levels of play in toddlers when paired with older children, it may be interesting to investigate the patterns of play when older infants are paired with toddlers or preschoolers.

Toddlers in the multi-age grouping were observed exhibiting play behaviours indicative of leading activities for preschool children. These observations were not reflective of Howes and Farver (1987) who argue that toddlers when exposed to older children engaged in more
complex play but they did not transfer this level of play to same-age peers. These findings were not evident in the age-segregated toddler program. An interesting insight resulting from viewing the videotapes of toddlers in the age-segregated program was the number of instances of toddlers engaging in parallel play. In total there were 31 episodes where toddlers participated in an activity but there were no interactions unless initiated by the Educator. Further investigations in the area of toddler play with same- and mixed-age counterparts in a natural setting may shed further light on this finding. In addition, it may have implications for curriculum planning in toddler programs. Moreover, there may be implications for Educators who must recognize their role in supporting play among toddlers.

3. Preschoolers: Play

Within the multi-age grouping, preschool children were involved in play episodes with both same- and mixed-age children. Moreover, the findings show that a number of the occurrences involved toddlers. There may be several explanations for this. There is the possibility that at the time of the observations, there were few preschool children present, therefore setting the stage for toddlers and preschoolers to engage in play together. It may also be that preschoolers are inviting of younger children to join in their activities. It seems reasonable to suggest that preschoolers in a multi-age program may not be cognizant of the fact that younger children are becoming involved in the play, thus lending itself to a natural happening. If, as the literature indicates, toddlers are capable of complex levels of play when paired with older children then it would seem probable to suggest that they are not a hindrance to preschool children during play episodes.
As expected, preschool children in the age-segregated program engaged in play with their same-age peers. Noting the differences in materials and toys available to the children leads to the question: are preschool children in age-segregated programs exposed to more variety of activities or in general to a more multifaceted environment?

**Role of Peers in Shared Activity**

In reference to scaffolding and acting as the expert, older children in the multi-age grouping had opportunities to take on the role of the expert with younger children. This finding is consistent with Berk & Winsler (1995) who claim that young children are capable of scaffolding less competent peers. Through social interactions with others, older children were afforded the experiences of sharing their skill with younger children. Alternatively, younger children are exposed to numerous “teachers” whereby an educator does not need to be the one to assist a child in need. These observations also reflect Vygotsky’s notion that in a multi-age grouping individual children have access to more knowledgeable peers (as cited in Berk & Winsler, 1995).
Summary

This exploratory investigation has shed light on the affordances and opportunities a multi-age child care model offers children when infants, toddlers, and preschoolers are grouped together. It is imperative that one model is not considered superior to another but that both models are viewed as acceptable forms of alternative group child care.

Ethan an infant, walked into the playroom from the observation room and saw Oliver, a preschooler who had just arrived at child care. Ethan screamed, laughed, and ran toward Oliver. Ethan hugged Oliver, who hugged him back.
Contributions

One purpose of this exploratory field investigation included adding to the growing research related to multi-age groupings. As an observer/participant, I was afforded a rare opportunity to document the lived experiences of children in a multi-age grouping. Hence, this study presents a detailed and rich description of the experiences of children in a unique group setting.

The second purpose was to provide information for policy developers, government officials, faculty in early childhood education programs, and early childhood educators. This investigation presents data that illuminates the affordances and opportunities available to children in multi-age groupings. Therefore, practitioners and specifically government and policy developers need to think beyond the parameters of legislation and investigate acceptable alternatives to age-segregated centre-based groupings.
Limitations

My research objective was to determine what affordances and opportunities a multi-age child care model, as compared to a conventional age-segregated model, offers children when infants, toddlers, and preschoolers are grouped together in a program. Thus, this exploratory investigation was not intended as a systematic research study but rather as a qualitative case study of a distinctive pilot project that may offer children unique experiences not readily available in age-segregated programs.

In qualitative research, triangulation by which researchers employee three techniques of data collection assists with the analysis and verification of the data. "Typically this process involves corroborating evidence from different sources to shed light on a theme or perspective" (Creswell, 1998). In the present study, employing the concept of triangulation was difficult thus resulting in limiting the type of data collection to observations in the multi-age setting and observations and videotaping in the age-segregated setting. However, to compensate for the restricted methods of data collection, observations were conducted over a three-month period leading to a dense compilation of data.

A second limitation is missed interactions. While I was concentrating on documenting an episode, there were countless others occurring in the setting. Although I found that videotaping (in the age-segregated program) lessened this limitation to some degree, there were still a number of interactions that took place out of the camera's field of vision. Therefore, nothing can be said regarding the proportion of these episodes to other behaviours.
A third limitation involves the concurrent validity of the checklist. Employed for the first time in this study, comparing the checklist to established measurement tools and utilizing it in the field would illuminate the strengths and weaknesses of the checklist.
Future Directions

The present study has shed light on a number of issues, several of which were detailed in the discussion section. However, future directions for research should also include analyzing toddler and preschool play, which could in effect have implications for practice. In addition, investigating prosocial and other-regulation behaviours exhibited by children in a multi-age setting could help educators understand the dynamics of mixed-age interactions.

Finally, multi-age child care models may have implications for early childhood educators, thus future research should focus on the role of the educator. Trained primarily to work with age-segregated groupings, how do educators incorporate theory to practice when faced with the varying developmental needs of infancy through to the preschool years?

Multi-age groupings are a recent phenomena, thus research in this area, particularly at the early childhood level can only enrich and extend our knowledge.
Conclusion

Often, early childhood educators, government officials, and child care advocates present the view that families should have choices as to the type of alternative child care they choose for their children. The present study demonstrates that models of child care delivery can move away from the conventional structures that are presently in place in the province of Ontario. With growing research in support of multi-age groupings and with successful pilot projects currently operating, researchers and practitioners, in partnership, could make multi-age groupings as commonplace as age-segregated programs, thus providing realizable options for families and their children.
References


Appendix A

* Floor plan of the Multi-age Playroom
Multi-age Centre Playroom
Licence Capacity:
3 Infants
5 Toddlers
8 Preschoolers
Appendix B

* Floor plan of the infant playroom in the conventional child care centre
Conventional Child Care Centre
Infant Playroom
Licence Capacity: 10
0 - 18 months
Appendix C

* Floor plan of the toddler playroom in the conventional child care centre
Conventional Child Care Centre
Toddler Playroom
Licence Capacity: 15
18 - 30 months
Appendix D

* Floor plan of the preschool playroom in the conventional child care centre
Conventional Child Care Centre
Preschool Playroom
Licence Capacity: 16
30 - 48 months
Appendix E

* Child-to-Child Interaction Checklist
Child-to-Child Interaction Checklist

Date __/__/____
Start Time of Observation _____
Finish Time of Observation _____

Multi-age
Conventional: Age Group: Infant  Toddler  Preschool

Number of children in interaction ______

Names and Ages of Children ____________________________________________

Part One: Scaffolding and Negotiations

Children are receptive to others participating in their play regardless of race, culture, gender, physical ability and/or language and demonstrate by:

口 offering others toys/materials

口 assigning others a role to play

口 inviting others to join in

When interacting with one another, children adapt their responses to meet the needs of the other child by:

口 modeling tasks step-by-step

口 offering verbal guidance

口 offering physical assistance

口 changing tone of voice, speech, word selection

口 changing proximity, gestures
Children engage in various forms of negotiations with others when:

- working on tasks
- deciding roles during play
- solving conflicts
- asking for assistance
- offering assistance
- asking for explanations
- offering explanations
- asking for encouragement
- offering encouragement

Youngest children observe other children involved in the program and respond by:

- continuing to watch
- moving closer
- joining in
- acting on later

Part Two: Leading Activities

Infants: Emotional Communication

- emotional exchanges  (smiling or cooing back and forth, talking with baby who responds by smiling, cooing, or attending)
- emotional exchanges  (physical interactions such as tickling, bouncing, patting; baby responds by cooing and smiling)
- emotional dialogues  (smiling after manipulating object)
- emotional dialogues  (baby initiates the interactions)
- dialogue related to objects and actions upon objects  (peer manipulates object in response to baby’s smile)
- objects are labeled and talked about
- baby’s actions are interpreted
- object-oriented sensorimotor actions  (peer models what to do with object; with other peer uses words to focus infant on separate objects and attributes)
- peer provides assistance which enables child to successfully manipulate object

Toddlers: Manipulation of Objects

- interacts with objects
- instrumental activity  (an object is used as a tool to do something to another object)
- language that is ties to object manipulation is used
- objects labeled and child uses accordingly
- independent behaviour  (opposing the will of others)

Preschoolers: Play

- child engages in play with other
**Communicating with Peers**

**Interacting with Younger Children**
*(initiated by older children)*

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<tr>
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<tr>
<td>preschooler with infant</td>
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<tr>
<td>preschooler with toddler</td>
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**Interacting with Older Children**
*(initiated by younger children)*

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<tr>
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<tr>
<td>infant with preschooler</td>
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<tr>
<td>toddler with preschooler</td>
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**Interacting with Same-Age Mates**

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<td>preschooler</td>
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**Role of Peers in Shared Activity**

- co-operating to successfully complete a task
- assuming assigned roles
- acting as sounding board for a peer
- acting for an imaginary person
- acting as the expert *(initiated by the expert)*
- acting as the novice *(initiated by the novice)*
- creating cognitive conflict

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**Other-Regulation**

- regulate the behaviour of others

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