

## **LOOSE PARTS: THE COLLABORATION PROCESS FOR A SCHOOL PLAYGROUND**

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### **Abstract**

A qualitative study of loose parts inclusion and the collaboration process was used as a basis for establishing a grounded theory of collaboration during play. The purpose was to determine common themes. Did data sets define themes between populations and across recording techniques? Three data sets included 1) children's drawings, 2) teacher comments, and 3) photographs taken on the school playground. Information derived from the data was recorded in drawing aspect, activity identified, and word association. Reliability between data coders required resolution of discrepancies until 100% agreement was reached. An 'Emergent Theme' rule set was used. Rule 1 required the idea occurred across at least two sets data to qualify as a theme. Rule 2 required commonality between words or in concept. Emergent themes included pretend play, gross motor, construction, and enclosed spaces. Collaboration and cooperation required from children during arrangement of loose part indicated sophisticated play behavior.

### **INTRODUCTION**

The simultaneous use of a wide range of loose parts (open-ended play materials with multi-uses called manipulatives) (Nicholson, 1971; Maxwell, Mitchell, & Evans, 2008; Sroka, 2006) on a playground was reported frequently in the pre-school literature (Strickland, 1979; Henniger, 1977; Brown & Berger, 1984) but infrequently in the school age literature (Wade, 1968; Maxwell, Mitchell, & Evans, 2008). Loose parts on the playground were not frequently used in the elementary school except in the case of balls and other competitive game equipment.

Both dramatic play and constructive play resulting from inclusion of loose parts other than game equipment were considered higher order play behaviors. Both led to increased cognitive functioning common to educational achievement and success with language (Umek, & Musek, 2001; Maxwell, Mitchell, & Evans, 2008). Both were considered when defining the positive outcomes or characteristics of play during childhood (Bodrova & Leong, 2003).

Positive characteristics of dramatic play included the initiation of the ability to think abstractly (the act of considering something as characteristic of another object) (Piaget, 1951; Saracho, 1994). Dramatic play behavior was especially important to the development of the child since during dramatic play, children made one object be a symbol of, or representative of another object. Researchers and child development professionals long considered dramatic play as one of the important bases for

abstract thinking and success in cognitive processing (Vygotsky, 1976; Rubin, 1982; Rubin, Maioni, & Hornung, 1976).

Frequently, the uses of small enclosed spaces were those chosen by children to stage dramatic play episodes. These spaces were frequently related to playgrounds that contained a myriad of loose or manipulative parts that children used in more complex construction play behavior (Frost & Campbell, 1985; Frost, 1992; Saracho, 1998). As behavior became increasingly sophisticated or complex (Kruidenier, 1978), children constructed semi-enclosed spaces in which to play. These spaces appear to be goal oriented and specific in nature (e.g. a house or den). The type of loose parts also was noted as determinant of the type of collaborative and cooperative play (Maxwell, Mitchell, & Evans, 2008).

Construction play as a higher order play behavior focused on sequencing or progression of events leading to a goal achieved usually in a social setting (Parten, 1932; Parten, 1933). If a sequence was not followed during construction with loose parts, the structure being built collapsed. During construction play, the visual abstraction of the constructed piece and the sequence leading to successful completion complemented each other to provide success (Gura, 1992; Doctoroff, 2001). The process of constructing was identified as important from the child's perspective (Kylin, 2003). The act of planning and constructing gave children a greater sense of independence and autonomy. This understanding provided impetus to study children's collaborative use of loose parts in a play setting.

Success was predicated on understanding the balance inherent in each piece, and the principles of physics that governed use of each loose part during construction (Haas, 1996). In addition, all types of functional skills were used during construction – lifting, carrying, pushing, pulling, spatial visualization and visual-motor coordination...(Caldera, Culp, O'Brien, Truglio, Alvarez, & Huston, 1999; Flynn & Kieff, 2002). Visuo-spatial understanding was also developed through trial and error of building upon loose parts (Caldera, et al., 1999; Ferrara, Hirsh, Pasek, Newcombe, Golinkoff, & Lam, 2011; Gura, 1992).

In spite of interest on the part of children and meeting educational goals established by teachers (Marshall, 2011), multiple loose parts were avoided in the elementary school yard for multiple reasons (Wardle, 2000, Wilson, 2012). These included 1) the adult viewed 'mess' following cessation of activities (Hurwitz, 1999, Nicolson & Shipstead, 2002, Quinn, 1996), 2) lack of principles for loose part organization on the play ground, 3) lack of focus on collaboration as a meaningful part of play behavior in children during free play (Kylin, 2003), and 4) complacency of thinking, convenience, and assumed adequacy of large play structures on the playground (Armitage, 2005).

Play area design using large play structures, was developed from the adult perspective due to multiple factors which included adult assumptions on the appropriateness of structures, and the historic adult understanding of the needs of children (Kylin, 2003; Knowles-Yáñez, 2005). This perception was

refuted through identification of child preference for the wilder play areas (Kylin, 2003; Moore, 1986) in contrast to adult planners desire for design of fixed play structures.

Natural and loose parts incorporate built in flexibility due to the nature of the materials, and were preferred by children over manufactured structures (Kirkby, 1989; Hart, 1979; Heerwagen & Orians, 2002). Access to loose parts allowed children to engage in constructing activities as compared to playing on fixed structures that do not allow modification. Opportunities provided to allow development of children's social play behavior included collaboration as promoted by availability of loose parts.

Collaborative experiences are innate in the process of construction. Construction by children involved planning, collecting materials, and fitting materials together. This process evolved from collaboration to cooperation by the nature of working with loose parts. Collaboration between children was described as negotiation on a shared goal, while cooperation was defined as sharing work (Crook, 1995).

Constructing actions were collaborative and cooperative in nature when children worked on creation of semi-enclosed space. Collaboration involved communication to create, and cooperation followed after the goal was identified (Denise, 1999). As with all processes, children needed to learn strategies of collaboration (Leman & Oldham, 2005). Cooperative learning was related to increase in child achievement (Cohen, 1994; Johnson, Johnson & Stanne, 2000).

A qualitative study of loose parts inclusion (Nicholson, 1974; Henniger, 1993) and the collaboration process (Hart, McGee, & Hernandez, 1993) between developers and users was employed across populations of children and teachers. Qualitative research techniques were used as a basis for establishing a grounded theory of loose parts inclusion (Glaser & Strauss, 1967; Creswell, 1998; Creswell, 2003). The purpose of the study was to explore for common themes, representations (drawings, written records, photos) by children and teachers of events and episodes related to 'favorite' or 'most fun' stimulated responses.

Guiding Question: Did representations by children and adults of loose parts play activities and photographs of the play episode define unified design ideas or themes between populations and across recording techniques?

## **METHODOLOGY**

The mixed methods approach was employed for this study. Both qualitative and quantitative techniques were used. The instrumentation materials satisfied the criteria for Exempt Research with the Certificate of Exemption provided through the Washington State University Office of Research Assurances (IRB number 12669).

## Population

Seven equally sized classes from the same elementary school in Iowa participated in the loose parts play activities (N=200+). Seven adult teachers and one play specialist designer constituted the adult population.

## Instrumentation

Three recording techniques were used to generate themes for the grounded theory. These were 1) children's drawings, 2) teacher written comments after activity, and 3) photographs taken of loose parts activities on the school playground (Pellegrini, 2001; Fjortoft & Sagae, 2000). The three recording techniques served as a triangulated system used to determine emergent themes (see procedures and analysis below). A data recording sheet was used to record triangulated data.

## Procedure

Procedure consisted of three data set explanations. Also, reliability assessment was explained followed by explanation of frequency counts derived from coded data extracted from the three data sets.

**Data Sets.** A coded system recorded in the top right corner was used to keep the tree Data Sets in order. Grade level, subject number and multiple pages of drawings or written word (for the same subject) were used in the numbering code (see Figure 1). 'After' play episode also was in the coding of subjects since some classes of children recorded both pre and post episode drawings.

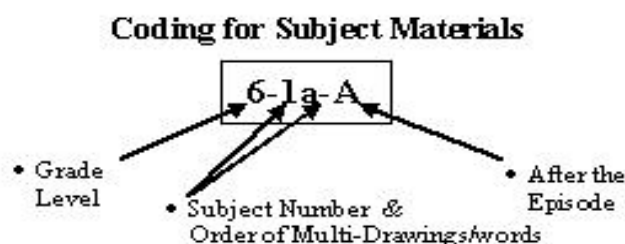


Figure 1. All drawings from children, teacher comments, and photographs were coded using the same format.

*Data Set #1.* All information on the children's drawings was recorded on a data sheet in three categories. These included 1) aspect of the drawing (e.g. slide), 2) activity (e.g. running), and 3) word associations (e.g. 'girl is swinging'). Reliability and frequency counts were established.

*Data Set #2.* Written comments from three teachers to describe the loose parts play activity were analyzed for content, sentence by sentence. Descriptive words for teacher content were recorded in the same three categories on the data sheet as used in the children's drawings (Data Set #1). Reliability and frequency counts were established in the same way described for Data Set #1.

*Data Set #3.* Photographs (n=9) taken by a contracted photographer, were analyzed for content on a data sheet for three categories. Categories were the same as those used for Data Set #1 and Data Set #2. Reliability and frequency counts were established in the same way as described for both of the other data sets.

*Reliability and Frequency.* Reliability between data recorders was established using a content analysis technique. First, one rater recorded the content of the child drawing using the three categories (Record #1). Another rater followed the 'Record #1' within 24 hours to generate 'Record #2'. Discrepancies were resolved using discussion between raters to focus on content to gain 100% agreement (Franzosi, 2004; Langendorfer & Bruya, 1995).

Frequencies of occurrence across children's drawings for each category were totaled (quantitative technique). Frequency counts were calculated for Data Set #2 and Data Set #3. Frequency counts were totaled across the three data sets as a combined frequency.

## Analysis

An 'Emergent Theme' rule set was used to determine if frequently occurring ideas recorded on the data sheets could be grouped in analysis for emergent themes (see Table 1).

Table 1. Administration of two Rules Produced Emergent Themes

Rule	Emergent Theme Rule Set
Emergent Theme Rule #1	<i>The 2X3 Rule.</i> The idea occurred in two of the three data sets.
Emergent Theme Rule #2	<i>The Commonality Rule.</i> The words or concepts behind the idea were similar as expressed in the data sets.

The rule set was determined after discussion between all members of the authorship team. Two rules surfaced as those most likely to yield themes resulting from data sets which recorded the collaborative design process. The first rule focused on the occurrence of the theme idea across at least two sets of triangulated data. The rule was called the '2X3 rule'. For theme generation, occurrence in two of the three data sets was required for inclusion. The second rule focused on the commonality that existed between words (e.g. music and musical instruments), or the commonality that existed in the conceptual understanding that provided background for the word counts on the data sheets. The 'commonality rule' was used to determine similar meaning or similar concept associated with a theme (e.g. skirt, dress, wig for 'dress up').

## RESULTING EMERGENT THEMES

The Guided Question considered if representations by children and adults of loose parts play activities and photographs of the play episode defined unified ideas or themes between populations and across recording techniques. The Guided Question was answered with the emergence of themes.

Using data sets and the 'Emergent Theme Rule Set', four themes were isolated from 1) children's drawings, 2) teacher's comments, and 3) photographs of the loose parts play episode. These included pretend play, gross motor, construction, and enclosed spaces (see Figure 2).

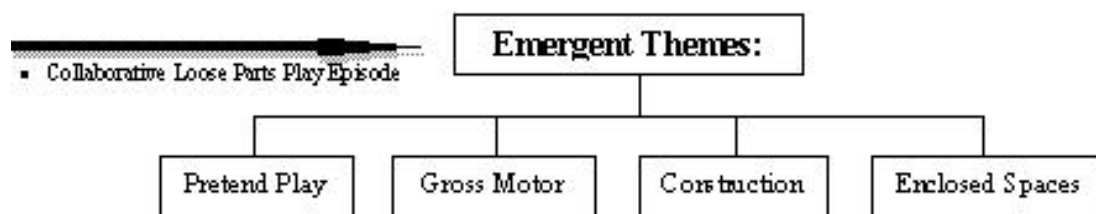


Figure 2. After a collaborative process to establish a loose parts play episode and after children collaborated during a loose parts episode, four themes emerged from three data sets to define the design process.

Frequency counts on data sheets for the three data sets indicated grade level participation in these four themes (see Table 2). Pretend play was most important to Kinder and First graders. Enclosed spaces were most important to Second Graders. Fitness and enclosed spaces were most important to Third Graders. Construction was most important to Fourth Graders. Fifth graders focused most on gross motor activities. Sixth Graders focused on construction and enclosed spaces play.

Table 2. Percentage of Occurrence of Four Themes By Grade Level.

	Percentages of Themes						
	Kinder	First	Second	Third	Fourth	Fifth/Sixth	Sixth
Pretend Play	40.00	20.00	0.00	5.00	15.00	10.00	10.00
Gross Motor	12.50	12.50	0.00	25.00	12.50	25.00	12.50
Construction	0.00	5.88	11.77	17.65	0.00	0.00	23.53
Enclosed Space	0.00	7.14	35.71	21.43	0.00	0.00	21.43

Frequency counts from raw data submitted to the 'Emergent Theme Rule Set' indicated that pretend play occurred most frequently across age groups. This was followed by construction and enclosed space themes. Gross motor activity was the least frequent theme of activities associated with loose parts play episodes.

## CONCLUSION/IMPLICATIONS

It is interesting to note that the collaborative process between players evolved even as the project took roots in the children's play. What started as a recess period with which the children were

familiar, ended as a series of groups in which children puzzled over the materials available to find ways to use them together in a different or creative manner.

As analysis proceeded, four themes emerged. These themes guided the nature of the collaboration between players. The language used to describe the drawings generated after play, and the pictures taken, were corroborated by the reports filed by teachers on the playground.

At first, as the adult leaders considered the use of loose parts on the school playground, the designer adult and the teacher adults discussed possible interactions and expected outcomes. After children cautiously began the play episode, the activity burst into a series of discussions and intensive chatter about what could be done with the loose parts. Before long, small groups and then larger groups coalesced to form interactive and engaged children participating in collaborating discussion and planning followed by cooperating action to achieve goals.

Especially in the older group of children (3<sup>rd</sup> grade through 6<sup>th</sup> grade), language seemed to guide the play episode. First, children huddled to discuss, and then expanded to collect and regroup materials as conversation and interaction guided activity. Children developed spatial understanding by constructing space to occupy. They developed spatial thinking ability by collaborating with cohorts on a plan and cooperating to realize the plan. The active-learning component of planning and constructing allowed children to learn through doing (Casey, Andrews, Schindler, Kersh, Samper & Copley, 2008).

The collection process used by children prior to regrouping of materials, was curiously like the process of 'Branching' described as a predictable play behavior of children by Schappet, Malkusak, and Bruya (2003). Collaboration itself and the cooperation required of children during arrangement of loose part during the play episode indicated more sophisticated play behavior as a result of the organization by adult leaders of the play episode to suggest collaborative effort. Allowing children to engage in planning processes through the nature of loose parts play served to promote sense of "environmental competence" (Moore, 1986) while increasing children's sense of empowerment (Iltus & Hart, 1995).

The emergent themes from this study offered specific opportunity that changed the viewpoint of children while empowering them during use of loose parts collaborative play. Traditional play area design processes focused on adult perspective rather than the child's viewpoint. Design of play areas as approached by adults focused on safety and durability, while children focused on opportunity for components that allowed manipulation (Kylin, 2003; Iltus & Hart, 1995).

Components in the environment led to ways of involving children in the play area design process through independent and collaborative action, while improving visuo-spatial skill. Design of the play area based on users preference (children's), yielded increased interest and engagement by the user group in the play setting (Iltus & Hart, 1995). Child interest and engagement stimulated the emergence

of themes derived from collaborative work between children. Engagement provided direction for increasing or systematizing incorporation of loose part components into the play area.

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