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Children in Archaeological Lithic Analysis

Jennifer Hildebrand

Abstract: One assumption that persists in the field of archaeology is that it is easier to observe children within historic sites through toys or burials than it is to observe children within a prehistoric setting through lithic production. The purpose of this paper is to examine the current position of children within the prehistoric archaeological literature and to provide case studies of research that focus specifically on how children can be observed within lithic analysis.

Introduction

There are many avenues through which one can observe a child's impact on the archaeological record. Children actively participated in creating and altering the archaeological record alongside adults. However, children and childhood have traditionally been neglected in archaeological interpretations of the past until recently with the increase in awareness that evidence of children can be observed. Studying children in archaeology provides insight on all aspects of society. These include economic contributions with child labor, subsistence strategies, population and health, and social rituals and perceptions of children's roles. Many scholars have been successful within this pursuit though studying this topic can pose challenges. One area where the presence of children has been addressed is within prehistoric archaeology. The purpose of this paper is to examine children in prehistoric archaeological research, with examples of articles that have focused on observing children's activities through lithic analysis.

Children were present in the prehistoric environment yet the difficulty is attributing physical evidence to them. A discussion of recent literature can be used to show how the identification of children in the prehistoric record has been addressed (Baxter 2005; Chamberlain 1997; Crawford and Lewis 2008; Kamp 2001; Lillehammer 1989; Moore and Scott 1997; Roveland 1997; Sofaer Derevenski 1994). This is by no means an exhaustive examination of every type of archaeological research involving children, but the variety of

methodologies and research questions is representative of approaches that have been utilized thus far.

Scholars have observed children using several techniques including technological and spatial analysis, craft production and learning (Bamforth and Finlay 2008; Ferguson 2008; Fisher 1990), labor production and technology of tool production (Bagwell 2002; Crown 1999; Finlay 1997; Grimm 2000; Sillar 1994), apprenticeship (Pigeot 1990) skill (Bagwell 2002; Bleed 2002; Grimm 1998; Stout 2002), experimental archaeology (Ferguson 2003; Grimm 2000; Hogberg, 1999, 2008; Hammond and Hammond 1981), ethnographic research (Hays-Gilpin 2002; Lave and Wegner 1991:111; LeVine 2008), children in the Paleolithic record (Shea 2006; Stapert 2007), and site formations processes (Baxter 2000; Bird and Bliege Bird 2000).

Overview of Children in Archaeology

Why study children in archaeology? To answer that question, it is important to first acknowledge children within the archaeological record. There are numerous studies dealing with children in archaeology that emphasize the importance of a child's experience and the implications of that experience on the archaeological record (Baxter 2005; Callow 2006; Crawford and Lewis 2008; Finlay 1997; Kamp 2001, 2002; Lillehammer 1989, 2000, 2010; Roveland 2000; Sofar Dervenski 1994, 1997, 2000). Each of these authors provides insight into the sub-field along with literature reviews of the topic and completed works. One publication by Finlay (1997) has been most beneficial for the purposes of this paper by providing a descriptive literature review on children in lithic studies up to the point of publication (Finlay 1997). Other authors survey work done in the field and discuss where it is going with future research.

Acknowledging children is important for two main reasons. Firstly, children make up a portion of any society studied in the archaeological record. Secondly, children one day become the adults in any society. According to Jane Baxter (2005), "Childhood is a prolonged period of dependence during which children mature physically and acquire the cultural knowledge necessary to become accepted members of society" (Baxter 2005:1). The definition of "child" varies considerably among cultures, and members of each culture hold a unique set of expectations for the roles and behaviors deemed appropriate during childhood.

Many pre- and protohistoric studies in theory and method have been utilized in developing theoretical frameworks. These studies discussed the archaeological evidence through context, settings, and

backgrounds for exploring children and the material culture of children in the archaeological record (Lillehammer 2010:16). However, this was not always the case. Roveland (2000) discusses the topic's literature and methods. Within this article, the author surveys articles within *American Antiquity* and the journal for the Society for *American Archaeology*, in regard to how many times children were studied from 1935 to 1999. The rarity of children as a central focus is emphasized, noting that the most frequent contexts of children mentioned dealt with burials, demographic calculations, and miniature artifacts with a small number of studies mentioning children in artistic representation and children's production and activities.

The first mention of children within an archaeological context was carried out in 1936 by Dellinger in regard to describing baby cradles made by "Ozark Bluff Dwellers" (Roveland 2000). Often in the earliest studies, children were mentioned but not necessarily the focus of the study. For example, if toys were mentioned in articles or reports, children were not. The assumption was that if toys were present the children did not need to be mentioned. Within this article, children within a mortuary context were discussed in great detail. During the 1970s and 1980s, the majority of studies including children were within the context of mortuary and paleodemographic studies with such goals as "predicting fertility rates and constructing model life tables for prehistoric and historic populations" (Roveland 2000:42). However, these studies discussed children more from an adult's perspective and not from the perspective of the children.

In the 1960s, Philip Aries's (1925) publication had an influence on how children can be viewed through art. Aries argued that the concept of childhood did not exist until modern times. From this, the study of children and childhood evolved out of gender theory within social archeology in the 1990s (Sofaer Derevenski, 1994, 1997; Moore and Scott, 1997). According to Sofaer Derevenski (1994), the advent of post-processualism within the archaeology of gender has influenced new social archaeologies (Sofaer Dervenski 1994). "Post-processualism contributed to an archaeology of gender through concepts of the active object, in which material remains are deemed to be involved with social structure by acting as active symbols in the past" (Sofaer Derevenski 1994:13). All objects children interact with provide a medium for communication and maintain social values and cultural symbols.

Until recently, "Few archaeological studies have explicitly considered children" (Finlay 1997:205). The first article published in 1989 in the *Norwegian Archaeological Review* by Grete Lillehammer is considered to be the "birth of the archaeology of childhood" and was the first main attempt to view systematic methods and theories on

childhood studies (Lillehammer 1989). Before this publication, children are almost never mentioned in archaeological inquiry. Within the article, Lillehammer uses methodological, historical, and ethno-cultural aspects to address the absence of a child's world from archaeology. Background information within a Scandinavian context is provided and human osteological material and tests on lithic materials are discussed. The author provides a detailed history of childhood with De Mause's evolutionary model of child-rearing and the model employed by Philippe Aries (1962) within his work entitled, *Centuries of Childhood*. A model of psycho-cultural research demonstrates the main factors involved in childrearing along with an ethnographic comparison of children's chores amongst six cultures (Lillehammer 1989:89-95).

Within another article by Lillehammer (2000), a need for developing a cultural theory of ageing in archaeological theory in order to analyze children in the past is suggested, as well as, a call for methodological approaches in understanding time and space in relation to children's world, cultural memory, and changes in perceptions of children. The author also discusses the need to separate the world of adults and children in viewing generational change between mothers and children (Dervenski 2000:23-24).

Another author who focuses on children in pre-historic archaeology is Kathryn Kamp (2001). Within this article, Kamp discusses the importance children's labor had on subsistence strategies and evidences of a child work force in the archaeological record. The archaeology of children and play is discussed, as well as a form of parental manipulation with the number of toys decreasing with the number of children playing verses more isolated children having an increased number of toys. Emphasis is placed on conscious teaching where childhood consists of the time when one acquires the needed skills to function within culture (Kamp 2001). Kamp emphasizes childhood as a cultural construct in definition and function and challenges archaeologists to investigate childhood based on empirical archaeological evidence in order to avoid stereotypes or assumptions.

Evidence exists from the past few years in the form of publications, at conferences, and in online discussions that archaeologists are prepared to "engage in serious theoretical and methodological dialogue regarding prehistoric children" (Roveland 2000:50). For example, several edited volumes on childhood archaeology include (Kamp 2002; and Moore and Scott 1997; Sofaer Dervenski 1994). An example of a conference symposium includes a Society for American Archaeology (SAA) symposium on childhood organized by Blythe Roveland and Martin Wobst in 1994 (Kamp 2001). In 2005, the Society for the Study of Childhood in the Past

(SSCIP) was created. This society is an international and interdisciplinary organization that promotes the study of the field. (SSCIP 2005). It appears the sub-field has been in a steady climb since the early 2000's with articles published on the status of children in archaeology (Baxter 2005; Crawford and Lewis, 2008; Lillehammer 2010) and children within archaeological research (Bamforth and Finlay 2008; Ferguson 2008; Hogberg 2008; Shea 2006). With this said, there is still a need to increase incorporation of children within research designs and publications.

Lithic analysis and incorporation

Archaeological material culture has been viewed by archaeologists as being created by and for adults or by adults for children. With the theories of childhood archaeology, material culture can be seen as being created by children or altered by children through use. According to Lillehammer, in order to go beyond the adult world and the limitations and expectations of children, we have turned to the material world of children (Lillehammer 2010:32). Within the prehistoric context, it is difficult to decipher what culture consisted of; therefore, archaeologists look to the physical record left behind. The prehistoric material record is often in the form of lithic debris. One of the most interesting topics in the area of lithic analysis is the incorporation of child roles within production and use.

Specific studies of children in lithic analysis contribute greatly to the understanding of children in prehistoric settings. Lithic artifacts include all culturally modified stone tool material located on a prehistoric site (Andrefsky 2005). Flintknapping has two distinct meanings. Flint refers to "any lithic material which fractures conchoidally upon force being loaded into that material" which is the basis for flaked tool production, whereas knapping refers to the breaking or shaping of stone or flint by a quick, hard blow (Flenniken 1984:187). Basically knapping is the process of fracturing stone to make stone tools. One can further understand prehistoric technologies from modern flintknapping experiments (Flenniken 1984). Skillful flintknapping is primarily a result of instruction and practice; therefore, the presence of poorly knapped pieces might be attributable to children who have not yet learned proficiency in knapping.

Chipped stone technologies can have the potential to contribute to the identification of children in the archaeological record. Stone is a fairly abundant natural resource and when easily obtainable, can be worked by novice knappers. Information about skill levels can also be observed through lithic artifacts. (Grimm 2000:54). During the

enculturation process, children obtain knowledge on the skills necessary to learn, and due to this process, skills are made possible to study (Kamp 2001). Once the presence of children has been determined, there are four main types incorporated and utilized by researchers to explore the presence of children in prehistoric settings utilizing lithic analysis. These four types of skill acquisition generally fall into the categories of apprenticeship, learning, play, and imitation.

Case Studies

Research techniques employing various types of lithic analysis such as, craft production, core reduction, refit analysis, technological and spatial analysis, replication, and experimental analysis can be applied to assess children in prehistoric settings. Ferguson (2008) discusses craft production. In this article, the author addresses the issue of using the terminology of “novice” and “child” in ways that oversimplify factors in craft production. These terms can be confusing, as an unskilled knapper does not necessarily need to be a child. (Finlay 1997:207).

Several factors influence the acquisition of flintknapping skills including the danger of tool production, raw material value, raw material availability, raw material recyclability, individual physical and mental development, and social factors within tool production (Ferguson 2008). The author discusses how children would need to learn these factors from adults and provides a data set to support skill development as a craft that requires practice and proper training.

The term “scaffolding” is discussed within craft production as a “means of fostering experience and skill acquisition in a particular activity by working closely with a skilled craftsperson” (Ferguson 2008:52). Scaffolding explains the way a skilled knapper provides assistance to a novice. Signatures of this scaffolding are examined by experiments that are sanctioned and unsanctioned with a result of identifying where children are observable in lithic skill acquisition (Ferguson 2008:52). In terms of raw material access and value, there are archaeological studies (Bleed 2002; Hogberg 1999; Pigeot 1990) where raw material is devalued based on waste or poor quality of material, which provides the opportunity for unskilled knappers to experiment. Two contemporary studies (Ferguson 2003; Hogberg 1999) have also studied poorer raw material utilized by less skilled knappers. When raw material is abundant and not valued, it is more acceptable to hypothesize that children would have been allowed to experiment on their own or under supervision (Ferguson 2008).

In terms of recyclability, material used by inexperienced knappers is unusable up to a certain point in the reduction process. It would be more difficult to recycle used raw material unlike modifying

a projectile point into a scraper (Ferguson 2008:55). Unlike stone tool manufacturing, ceramic production yields the ability for recyclability. A study on prehistoric children in the American Southwest using fingerprint analysis showed that children as young as 4 years participated in ceramic production with practice cups made of previously recycled material (Kamp et al. 1999). Danger is another factor that could affect the presence of children and the age in which children enter production, have access to observe production, and practice production. Overall the author provides three suggestions for scenarios on preservation of child participation in craft production. These include; formal apprenticeships, the use of scaffolding, and individual experimentation (Ferguson 2008:63).

Ferguson (2003) examines how the lack of skill variability could have been due to novice knappers' methods embedded through a learning process of production by comparing these learning strategies that exhibited successful learning and conservation of raw materials. In addition, this research suggests that young children were most likely excluded from knapping when raw material was highly valued and in demand (Ferguson 2003:113). Another area of study in craft production involves psychology of development. Crown (1999, 1998) suggests that one needs to understand psychological development amongst children in order to identify products made by children. This proposes that errors and imperfections may be associated with immaturity and not just a lack of expertise (Kamp 2001).

Production Skill and Learning

Bamforth and Finlay (2008), addressed the qualifications of skill and how archaeologists have looked at skill in stone tool production, as well as the anthropological and archaeological approaches to identifying the ways in which individuals become skilled (Bamforth, Finlay 2008:1). According to the authors flintknapping exists between knowledge and practice; the relationship between the two changes with experience, through each thought process, material, and flake removal (Bamforth, Finlay 2008:2). Within the literature review of skill, the authors acknowledge the lack of attention to identifying the work of novice stoneworkers and the contexts of learning with studies that have been done relying on core and debitage analysis.

Finlay makes the case that lithics are especially useful for seeing children in the archaeological record because unlike other classes of material culture, the ability to reconstruct reduction sequences through refitting in lithic analysis is possible (1997:205).

Since lithics are rarely recycled in craft production like pottery and metalworking, lithics are more likely to preserve the learning sequence. Lithic procedures studied through the *chaine operatoire* “provide scope for the classification and differentiation of stages and corresponding requirements for skill (Finley 1997:206). It has been used to evaluate technical details of a knapping episode. (Grimm 2000:53).

Various archaeological studies have claimed to identify beginning knappers within the archaeological record by identifying the low quality of knapping. In order to do so, archaeologists have to be able to “isolate the products of an individual knapper by detailed spatial analysis and refitting” (Finley 1997:207). One example states that “lithic technology has a unique potential, among all the technologies employed by Upper Palaeolithic peoples, for aiding us in our efforts both to identify children and to investigate their world” (Grimm 2000:53). The application within this research incorporates technical and social aspects of core reduction. The *chaine operatoire* approach is utilized within the analysis of flintknapping by using the diacritical diagram drawing of a core showing flake scar directions. Individual knappers can be identified and spatial distribution of blanks can provide information on their movements.

Grimm uses the term novice knapper versus experienced knappers when distinguishing between children and adults in refit analysis. Novice knappers are identified as exhibiting “limited control over basic technical principles, they do not produce useful products or have access to good quality raw material, and they tend to work in locations that are peripheral with respect to adult work spaces” (Grimm 2000:54). Lack of control and errors in production can be viewed within the production knapping process with non-productivity. Raw material utilized can provide insight into the skill level of the knapper.

The activity of a Solvieux apprentice knapper was employed by using behavioral scenarios with patterns of core association, apprenticeship as social practice, the structuring of resources, and the role of motivation and identity is apprentice learning. Social practice theory formulated by two scholars of cognitive science, Lave and Wegner (1991), is employed to provide a basis for exploring the social dynamics of prehistoric flintknapping. The case study presented was “interpreted as a specialized hunting camp reflecting the activities of an all-male group until novice flintknappers were recognized through refitting and technical analysis” (Grimm 2000:67). Based off of this discovery, the occupation of the Solvieux Upper Perigordian occupation was interpreted as a simple family hunting camp of men, women, and children, carrying out routine activities.

Specific studies of children in lithic analysis contribute greatly to the understanding of children in prehistoric settings. The main concept for studies that focus on the identification of a child's behavior through lithic materials states that, children are beginners and have not yet obtained proficiency (Apel 2001; Hogberg 2008). The skill of flintknapping is acquired through practice and knowledge; therefore, the presence of children in lithic production is attributed to poorly knapped pieces that display less skill than those capable of producing desired finished products.

There are four main types incorporated and utilized by researchers to explore the presence of children in prehistoric settings utilizing lithic analysis. These four types generally fall into the categories of apprenticeship, learning, play, and imitation. Apprenticeship and learning are a more common approach to children in lithics however; some scholars have attempted to analyze a child's presence through play and imitation (Kamp 2001, Hughes 1991, Hogberg 2008). Play exhibits certain levels of a child's behavioral development and is a cultural constraint, as well as a cross-cultural phenomenon. Imitation is a type of play that prepares a child for integration into society's social and economic activities (Chamberlain 1997). Both are important when understanding children in lithic analysis.

Ethnographic case studies consulted by Lave and Wenger (1991:111) demonstrate that the distinctions between work and play can be unclear in regards to apprentices. This concept fits well with empirically based archaeological expectations about beginning knappers. The process of play knapping provides opportunities to practice and develop both conceptual skills and motor skills. Within lithic technology, it is a long road to full participation. This process would have involved mastering skills through the process of play within the company of other apprentices. (Lillehammer 1989).

A case study of play and imitation is found in the article written by Anders Hogberg. This article utilizes a case study of play and imitation through lithic analysis. This article "examines the potential for identifying play and children's imitation in the archaeological record and reviews cultural constructions of play and cross-cultural behaviour" (Hogberg, 2008:112). The study is based on excavations of a discrete knapping site for Scandinavian Neolithic axe production in southern Sweden and discusses the ability to recognize and identify a child's activity area through the concept of child's play. One of the main questions addressed within the beginning of the article asks, "If archaeology wants to look for children in prehistory, what kind of child related behaviour can one expect to come across?"

those of novice knappers (Shea 2006:214). The main purpose of this publication is to state that there are “compelling reasons to expect that significant portions of the lithic record from the Pleistocene-age sites reflect children’s activities” (Shea 2006:215). Like many other scholars who study children, Shea calls for the creation of methods to identify child byproducts and emphasizes the need for more attention on the subject.

In terms of Neanderthal children, an article published in Northwest Europe in 2007, written by Dick Stapert addressed this topic by providing a background on Neanderthal children. Stapert utilized the avenue of apprenticeship in flint working as shown by the process of refitting analysis. Refit analysis studies from the Upper Paleolithic on the Magdalenian sites at Pincevent and Etiolles in France are provided as famous examples of studies that were able to identify individual knappers based on skill levels through the refitting of cores. (Stapert 2007:1). The conclusion of these studies indicated that most, if not all of these learners consisted of children and that refitting analysis has been most successful for revealing flint working by children, especially within the Upper Paleolithic sites (Stapert 2007:32). Sites where high quality raw material was scarce, one would often observed a learner utilizing abandoned cores originally used by experienced knappers when they had become too small (Stapert 2007:32). This type of activity was observed at Hamburgian site of Oldeholtwolde in the Netherlands.

Other sites were interpreted, as sites used only by children for practicing their flintknapping skills, like that of site Etiolless P15. The author also discusses how during the Paleolithic period, one could look for “failed flints” as a way of identifying children (Stapert 2007:23). Overall this particular article states that a lot of flint artifacts from the Lower and Middle Paleolithic are from children who are learning and/or playing. It is noted that during this period, children younger than fifteen made up more than 40 percent of the population and children need to be not left out of analysis and research (Stapert 2007:35).

Ethnographic research

According to Finley, “the ethnographic record provides a very limited data set about the contexts and nature of acquiring lithic skills” (Finlay 1997:206). One example, however, includes what Binford recorded in 1986 in his ethnoarchaeological work of Alyawara stone tool manufacturing. In this environment, children spread the news about tool production and the uninitiated young men came to watch. Within the literature review conducted by Roveland (2000), a few

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examples were provided. These include; Gould, Koster, and Sontz (1971)'s discussion on sacred adzes and ritual knives of Aborigines of Western Desert in relation to being kept out of sight of children, Wiessner (1938) description of arrow being kept tip down and out of reach of children amongst the Kalahari San for safety, and Binford's (1987) observation amongst the Eskimo stating that complicated craft items are rarely assembled in the midst of children playing (Roveland 2000:45).

Experimental archaeology

Cultural and social factors are based largely on experimental data (Ferguson 2008). One example of an experimental study is located within the above article by Hogberg (2008). This experiment with children flintknapping consisted of a behavioral replication study conducted by Mikkel Sorensen at the National Museum in Copenhagen, Denmark. It began with Sorensen asking a six-year-old boy to sit with him while he knapped. He did not give the boy instructions but allowed him to observe, ask questions, and imitate his work. The boy also looked at artifacts at the museum in an attempt to copy them. The results of the boy's flintknapping produced a set of objects that resembled prehistoric tools but "lacked all significant technological attributes" (Hogberg 2008:118). These results showed that the boy was capable of knapping through imitation in terms of form and shape, but was not able to imitate the correct technology.

Normal Hammond conducted another example employing ethnoarchaeological experimentation in 1981. He had his one-year-old son play with items within a vacant lot, and he documented his son's alterations to artifacts and their spatial distribution. This particular study received criticism from Hodder (1982) for its lack of insight into why children act the way they do (Roveland 2000).

Discussion and Conclusion

The topic of identifying the presence of children in lithic analysis can be a tricky endeavor, incorporating all aspects of analysis from material, to cultural, to behavioral. Skill level, material acquisition, subsistence and settlement strategies, and which lithic analysis approach is conducted to assess presence and interpretation of a child within site interpretation, are all important in determining the individual and/or communal level of children in lithic production.

"It is not enough to just pay cursory attention to children, to mention their existence occasionally, perhaps to desultorily discuss a

toy, infant health, or the possibility of an apprentice craftsman” (Kamp 2001:23). Children should be viewed as dynamic contributors to the archaeological record, free of all biasness through adult lenses and viewed as active agents. While there have been attempts at investigating aspects of prehistoric childhood or issues associated with them, archaeologists have not attempted to systematically reconstruct childhood within a prehistoric setting or relate these previous studies to the broader literature (Kamp 2001:24-25).

Problems arise when attempting to identify children in lithic studies through our western notion of child categories and behavior. In the simplest form, enough is not known about how children knap or as to how they learn the skills required for knapping. According to Finlay, if child as a research focus acquire a separate category of analysis, the stereotypes that dominate the field of archaeology will still exist (Finlay 1997:210). Assumptions are the most common problem within this type of research.

“In the process of emerging as child-centered archaeological research of children and childhood in the past, the subject has gone from the stage of being exotic to becoming an academic field of its own” (Lillehammer 2010:21). It is apparent from the literature review of children within archaeological research that the sub-field has grown. However, it is also apparent that a scarcity of the subject still exists amongst published material. Given current archaeological trends, the topic of children and their effect on the archaeological record through lithic analysis can only improve.

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