

This study was designed to explore how constructivist theory and pedagogy can be applied to early childhood Jewish education, featuring investigations of children's construction of knowledge of historical temporal time. While the understanding of temporal time is not an innately Jewish topic, it is a topic that is included in many Jewish studies and can be used as an example of how children construct knowledge. As will be discussed in this paper, Jewish early childhood centers use a plethora of educational approaches, running the gamut from a highly teacher centered pedagogy to complete play based models. By examining the learning of one kindergarten class, the study highlights ways in which a constructivist approach can foster an understanding of how children construct concepts and the benefits of applying cognitive constructivism as a foundation in Jewish early childhood education.

Literature Review

Constructivist Theoretical Framework

Constructivist theory was initially based on the work of Jean Piaget (cognitive constructivism) and Lev Vygotsky (social cultural constructivism) and continued by scholars in the areas of contemporary biology, psychology, education, and cognitive scientists. One can make the case that each theory was a reaction to the predominate theories of the day, behaviorism and maturationism (Gruber and Voneche, 1977). Fosnot (2005, p. 10) describes the differences between constructivism and these early theories:

"Rather than behaviors or skills as the goal of instruction, cognitive development and deep understanding are the foci; rather than stages being the result of maturation, they are understood as constructions of active learner reorganization. Rather than viewing learning as a linear process, it is understood to be complex and fundamentally nonlinear in nature."

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The constructivist theories of Piaget and Vygostky share the above understanding. Where the theories differ is the dialectic between individual and society. Piaget focuses his theories on the individual while Vygostky's focus is on the effects of social interaction. While this current research was designed to explore how constructivist theory can be applied to shaping curricula and pedagogy in early childhood Jewish education and particularly explores Piaget's understanding of three types of knowledge, it by no means lessens the importance of social cultural theory and its relevance to Jewish education.

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Jean Piaget's cognitive constructivism describes the personal formation of knowledge. Piaget formed the theory of constructivism by connecting ideas from the fields of biology, psychology, and philosophy. Piaget once summarized his theory of constructivism in an interview with Jean-Claude Bringuier (1977, p. 63): Â Â Â Â Â Â Â Â

I think that all structures are constructed and that the fundamental feature is the course of this construction: Nothing is given at the start, except some limiting points on which all the rest is based. The structures are neither given in advance in the human mind nor in the external world, as we perceive or organize it".

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Â Piaget's thoughts diverge from two historical theories of epistemology, empiricism and rationalism.

Empiricists

such as John Locke stress that an individual is born as a blank slate. He theorized that knowledge is located outside of the individual and is internalized through the senses. Locke (1947, p. 22) wrote "The senses at first let in particular ideas, and furnish the yet empty cabinet, and the mind by degrees growing familiar with some of them, they are lodged in the memory . . .". Piaget (1970) does not agree that knowledge is completely external to the mind but theorized (1971b) that mental structures are formed through the child's active manipulation and organization of experiences with people, objects, and events in their immediate settings.

Piaget also found problems in the theory of rationalists such as Descartes and Spinoza. Rationalists posit that children are born with innate reasoning abilities that are the foundations of knowledge. The rationalist perspective is that "individuals rather mechanically built up bodies of knowledge from a foundation of simple ideas that were passively derived from their experience" (Phillips, 2000, p. 8). Furthermore, rationalists state that the senses cannot be trusted and that reason must be used in explaining the formation of ideas (Kamii, 2000). Piaget's ideas are closer to those of rationalists than those of empiricists. Similar to Kant (whose influence Piaget often acknowledged), Piaget saw the structure of the individual human mind as the source of rationality but places more value than rationalists on the interactions with the physical world.

Inhelder (1977, p. 339) wrote that Piaget believed that, "knowledge is neither preformed in the object (empiricism) or in the subject (rationalism) but results from progressive construction." Kamii (2000) writes, "Piaget saw the importance of both sensory information and reason." (p. 4). Â Piaget did not disregard either empiricists or rationalists but sought to explain that sensory information and reason can be clarified through an understanding of three basic types of knowledge: physical, social, and logico-mathematical. He discusses how children at different stages of development rely primarily on one type of knowledge.

Physical knowledge is gained from the environment through the subject physically interacting with the object. Examples of physical knowledge are the length or texture of an object. In Kamii's (2000) words, "The ultimate source of physical knowledge is partly in objects, and physical knowledge can be acquired empirically through observation" (p. 5). During the sensorimotor period, physical knowledge overpowers all other input.

As children enter into the pre-operational stage, Elkind (1970) describes their next challenge as the conquest of the symbol. Symbols are closely tied to social knowledge that is created by people. The names of colors, language in general, the ways we should act in particular contexts, and how we celebrate certain holidays are examples of social knowledge (Kato, Kamii, Ozaki, & Nagahiro, 2002). Social knowledge is constructed through interaction with people (either directly or through people's creations such as books and media). In contrast to physical knowledge, social knowledge cannot be individually extrapolated from an object.

Logico-mathematical knowledge is also emerging significantly during the pre-operational period. Whereas the source of physical knowledge is primarily in objects and the source of social knowledge is primarily in other people, logico-mathematical knowledge is internal. As Kamii (2000) states, "The source of physical and social knowledge is partly external to the individual. The source of logico-mathematical knowledge, by contrast is internal" (p. 5). Logico-mathematical knowledge consists of connections between various ideas. A child who is presented with an orange ball and a purple ball thinks that they are similar. This understanding of similarity is an example of logico-mathematical knowledge. Many think that the similarity between the balls is observable, but this is not true. The physical balls themselves are observable, but the similarity between them is not observable. The similarity exists neither in the orange ball nor in the purple ball. If the balls were compared together in this relationship, the similarity would not exist for the child. The source of logico-mathematical knowledge, therefore, is in each child's mind.

Through these three types of knowledge one is able to discern Piaget's nod to both external (empiricists focus) and internal (rationalists focus) sources of knowledge. Based upon these three types of knowledge and their sources, it is evident that children are active learners who reorganize their mental structures and understandings based on experience. Researchers continue to use Piaget's methods to understand how children construct knowledge (Mayer, 2005; Brinkmann, 2007). Theorists have explained that children actively interpret their experiences in the physical and social worlds and thus construct their own knowledge, intelligence, and morality (DeVries, Zan, Hildebrandt, Edmiaston, & Sales, 2002). These theorists agree with Piaget's assessment that knowledge is not a static object that children possess at birth nor can it be transmitted from one mind to another. As Von Glaserfeld (2005) writes, "knowledge does not and cannot have the purpose of producing representations of an independent reality" (p. 3). Every person organizes his or her experience forming his or her unique versions of reality.

Historical
Temporal Time

Piagetian constructivism is often applied in mathematics and science. In the current study, Piaget's ideas are applied to children's understanding of historical temporal time. Many theorists believe that Piaget underestimated children's capacities to think about the past (Ormond, 2003; Bruner, 1973; Donaldson, 1978; and Brudenell, Cortvreind, Hallet, Kay, & Walkup, 2004). Piaget (1965, p. 206) describes children as having temporal egocentrism referring to the children's inability to reason about time that occurred prior to their birth.

To understand why Piaget is often cited as underestimating

children's abilities, one must understand the notion of time in Piagetian research. Piaget (1969) dealt with time in his book, *The Child's Conception of Time*, which was prompted by questions posed to him by Albert Einstein. Piaget (1969) dealt with not only understanding the passage of time but the relationship of time, speed and duration (Montangero & Naville, 1997). Battro (1973) cites more than 15 aspects of time explored by Piaget. Gruber and Voneche (1977) describe Piaget's quest to understand time as a study in the child's capacity to "dissociate duration from space, and space from speed and motion" he also looked at "order, simultaneity, synchronization, colligation, and addition of durations, and measurement" (p. 547-549).

Some of the conceptions often related to history - dates, events in time, famous people -fall under the category of social knowledge (which source is mostly in other people). However, temporal knowledge that children understand is logical mathematical knowledge (based on internal connections and reasoning). This understanding supports the hypothesis that while children might not be able to date Biblical incidents on a time line, or even more modern historical events, students can construct understandings of historical temporal time based on logico-mathematical knowledge.

Methodology

Research Site

The current study was conducted at a Jewish day school in a southern United States metropolitan area. The school was the only Jewish day school within a hundred mile radius and served both Jewish and non-Jewish students. The school was founded in 1992 and opened with an enrollment of 12 two-year-old students. At the time of the study, the school served 105 children from two-years-old through the fifth grade (56 boys and 49 girls). Approximately 70% of the students were being raised in the Jewish faith. Thirteen children in the school's kindergarten class were interviewed.

Data Collection and Analysis

Data were collected during the children's study of Passover using semi-clinical interviews that occurred once prior to the children starting the Passover study (March 11, 2009) and once in the middle of the study (March 24 through March 27). Children's interviews were based on Piaget's semi-clinical method, conducted in a manner described similar to Ginsberg's (1997, p. 27) flexible interview, Osborne & Freyberg's (2001, p. 152) interview-about-instances, and Good's (1977, p. 21) interview with manipulative aids.

Analysis of the data drew on Spradley's (1980) technique of domain analysis that seeks patterns within data. After initial coding of data, taxonomies (Spradley, 1980) were created to observe if a set of categories or subcategories based on semantic relationships were visible.

Limitations of the Study

The current study focuses on a group of children in one Jewish school in a small Jewish community in the United States

and does not represent all classrooms in all Jewish schools. As I serve as principal at the school where the observations occurred, and the Torah teacher is my wife, certain advantages and limitations were present. I employed various methods to insure that the findings were as credible as possible. These included member checking, prolonged engagement in the field (Creswell, 1997), and triangulation of data.

Findings

Initial Question

To study children's construction of historical temporal time, each child was asked, "Were you, your parents, grandparents, or anyone you know born when Moses and the Jews were in Egypt?" Findings showed that nine of the children responded that no one they knew were alive during the times that the Jewish people were in Egypt. When asked separately about their grandparents, seven responded that their grandparents were not alive during the times that the Jewish people were in Egypt, one child stated that they did not know, two children stated maybe, and three children stated that their grandparents were alive at that time. The children's answers on this question show that the majority of children were able to accurately assess the relationship between three generations and an ancient historical event.

Regarding the first three questions of whether the child, their parents, grandparents or anyone they know were alive when Moses and the Jews were in Egypt, children used math terms, including such statements as:

"My dad is 4 years older than my mom, my mom is 44 and my dad is 48 and they were born in 1990 something" (description using ages),

"I wasn't alive because I was only born in 2003" (description using dates),

Long, long, long time ago and great, great, great grandmother (qualitative language),

Because a child's grandmother was born in Egypt, the child assumed that she was alive in the times of Moses (personal knowledge of their grandparents).

These each show that five-year-old children have complex logico-mathematical approaches when confronted with questions dealing with temporal time.

Next in the interview process was a task that asked students to sequence eight images based on their historical time frame (see appendix A). Thirteen children were asked to sequence eight images but two children put each card down in the order that they were presented. When questioned why they did not try and sequence they responded that they did not "want to play". The other eleven children seemed to approach

the task with serious deliberation.

The list below provides the pictures, approximate date of the pictures, types of picture and any shorthand named used in this study.

Table 1.1: Images Used in Interview One

Images

Approximate
Date

Type of
Image

Shorthand
Name

Dinosaurs

Jurassic

Period

Pencil
drawing

Dino

Jewish
slaves in Egypt

Over
3000 years ago

Pen
and ink

Egypt

Knights

Middle

Ages

Pen
and ink

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Pilgrims

1776

Pen
and ink

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Passover
Dinner

1859

Oil

1859

Children's
Passover

1938

Photograph

Children

Passover
Dinner

1920

Pen
and ink

1920

Modern
Passover Dinner

Current
times

Pen and
ink

Modern

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Sequencing Images

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Table 1.2 depicts the children's arrangement of the eight images. The goal of this task was not whether the

children answered the questions correctly but the understandings found in the children's construction of knowledge.

Table 1.2: Children's Placement of Historical Pictures

Correct	
Dino	
Egypt	
Knights	
Pilgrims	
1859	
1920	
Children	
Modern	
% Correct	

Child 1

Dino

1859

Egypt

Knights

Pilgrim

1920

Modern

Children

20%

Child 2

Egypt

Dino

1859

Pilgrim

Modern

1920

Knights

Children

20%

Child 3

Dino

Egypt

Knights

Pilgrim

1920

Modern

1859

Children

40%

Child 4

Dino

Knights

Egypt

Â

Modern

1859

1920

Children

10%

Child 5

1859

Dino

Egypt

1920

Children

Modern

Pilgrim

Knights

0%

Child 6

Dino

Knights

Egypt

1859

Pilgrim

1920

Modern

Children

20%

Child 7

Dino

Egypt

Knights

Pilgrim

1859

Children

1920

Modern

80%

Child 8

Dino

Pilgrim

Modern

Knights

Egypt

1859

1920

Children

10%

Child 9

Dino

Egypt

Pilgrim

Knights

Modern

1920

1859

Children

30%

Child 10

Dino

Egypt

Â

Â

Â

Children

Pilgrim

Modern

20%

Â

1859

Knights

Â

Â

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Â

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1920

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Â

Â

Â

Â

Â

Child 11

Dino

Knights

Pilgrim

Egypt

Â

Â

Â

Children

10%

Â

1859

Â

1920

Modern

Â

Â

Â

Â

Â

Correct

9

4

2

3

1

4

0

2

Â

Â

Social Knowledge

Nine (82%) of the children identified that dinosaurs were the oldest image presented. The dinosaurs were by far the most correct placement (nine compared to the next correct picture placement of four). This might be due to the overwhelming amount of social knowledge that children possess regarding dinosaurs. Children's social knowledge of dinosaurs shows a clearly shared body of temporal understanding.

Similar to the reasoning that dinosaurs were placed most accurately due to the overwhelming amount of social knowledge children possess, so too, the picture of the Jews as slaves in Egypt might have been placed with consistency due to the children's social knowledge. Nine out of 11 children placed the image of the Jews working in Egypt in the correct position or one space away from the correct position. The children could not provide a logico-mathematical explanation of why they placed the image in this position. Most referred to being taught a lot about Egypt and "just knowing" that it was the right place to put the picture. When asking children directly about how they figured out where to place the images, answers included various sources of social knowledge; "someone else told me", "I read it in a book", "I saw the movie", and, "Morah S told them".

Physical Knowledge

After the image of the dinosaurs the next most agreed upon placement was that of the children's Passover meal (i.e., "Children"). Interestingly, eight children agreed to the incorrect placement of this image.Â Children's rationales for this placement emphasized the age of the children in the image. Students commented that the children in the image are so young, that the event could not have occurred that long ago. Similarly children placed a picture containing an elderly man early in the sequence indicating that it happened long ago because the man "looks old". When questioned whether the image of the child could have been a child from a long time ago many of the students commented that the child is young so it happened not long ago.

As seen in Table 1.2, the image of the 1859 Passover dinner (i.e., 1859) had the most varied placements. The image was placed in seven out of the possible eight slots. One reason for this could be due to the media (charcoal drawing) in which the image was created. Children referred to the fact that the picture did not look "real" and seemed darker than the other pictures.

Both of these examples seem to show that physical knowledge trumped the children's logico-mathematical knowledge. The children had difficulty trying to override the perceptual (physical) knowledge of the age of people depicted in the images to understand the conceptual knowledge of the age of the depicted event.

Logico-Mathematical Knowledge

Children's use of logico-mathematical knowledge can be seen in many of the results of this task. The data shows children demonstrating 11 ways to approach the topic using logico-mathematical thinking. One example is a child using logico-mathematical knowledge to figure out that dinosaurs needed to be placed first in the order. As opposed to most children, who relied on social knowledge, his logic was that dinosaurs came before, "because that means that you can't be there with dinosaurs because they might get them." In other words, he believed the dinosaurs must occur before all the other pictures or they would have killed the people in all of the pictures.

In another area of high agreement between children, the image of the knights was linked 55% of the time with the image of the Jews working hard. This logico-mathematical connection is that knights (who many children referred to as soldiers) would be part of the Pharaoh's army.

Four children used the logico-mathematical idea of a species or people becoming extinct when placing the images in order. One child figured that dinosaurs must have lived first because they are the only image that is extinct so they must have come early. Another child placed Native Americans prior to Jews using the logic that she does not see any Native Americans so they must be extinct and had to come before Jews who are still alive. A third child used similar logic in placing a picture of a Passover dinner with rabbis after one without rabbis. The child reasoned that there are still rabbis alive so the one with rabbis must be closer to the current time. Finally a child placed an image of Passover dinner after the Jews working hard making the connection that there are no slaves any longer so the picture with slaves must be older.

Further findings that support children using logico-mathematical knowledge are based on the current calendar date. When looking at the picture of the Passover dinner one child commented, "Yes this is celebrating Passover (she points to Seder plate) and didn't happen too long ago because Passover is almost here." While being an inaccurate strategy for deriving the age of the picture, this reasoning is an example of logico-mathematical thinking. The child reasoned that the holiday of Passover was about to be celebrated so the picture must be recent.

A number of children used fashion clues and historical technological clues in the images to figure out the historical sequencing of the image. Fashion was used as children studied details such as beards, hats (one child identified a hat as belonging to President Lincoln), dresses, and old fashion clothing. At least 6 of the children mentioned these details when sequencing the images. Using similar logic, children decided certain pictures were old because there were no trucks, cars or buildings. A child also thought that characters using sticks and ropes were old as we have better tools to use today.

In what can be considered the most significant finding of the study, children used at least eleven different logico-mathematical examples in arranging the images. These include using dates, ages, numbers, social tools like photo albums, the age of the people in

the images, the type of mediums used to create the image, fashion, technology, historical understanding (i.e., dinosaurs are extinct), the connections between images such as knights being Pharaoh's soldiers and personal history such as having a grandmother born in Egypt.

In summary, the children's answers produced findings that show that children use all three types of Piagetian knowledge in constructing an understanding of historical temporal time. A finding of the current study is that the children often used logico-mathematical thinking in constructing an understanding of historical temporal time.

Level of Difficulty with Sequencing

Children were asked the difficulty of sequencing each image. The majority of the children's responses mirrored the ease or difficulty in which the children placed the actual images. More than half the children stated that the dinosaurs and the children's Passover images were easy and in fact those were the two images that the children most agreed upon in placement. Neither of these images appears in the columns that describe difficult images. The Passover meal images (1859, Modern, 1920, and Children) were cited seven of the 10 times children identified difficult pictures which concurs with the difficulty the children found in placing these images in the sequencing task. As mentioned previously, the Passover dinner from 1859 was placed in seven out of the possible eight slots.

This fact that there are matching results on these two tasks (perceptions of hard and easy images to place and the actual sequencing of the images) strengthens the case that the children put much thought into the placement of the images in the sequencing task. If the children were performing either set of tasks using social knowledge, or just randomly placing the images, the results of these two tasks should not match. The fact that they do match shows that the children used logico-mathematical knowledge to construct answers in both tasks. These findings further support that the children use logico-mathematical knowledge in constructing an understanding of historical temporal time.

Historical Usage of Dates

Children used dates 13 times in explaining their answers in these interviews. The findings on date usage showed that the children possessed knowledge about how to use dates. For instance, all the children who used dates appropriately used previous dates; no child used a future date to describe a past incident. All the children knew that saying the last two digits or using all four digits of a year could represent dates. Children used dates in a logico-mathematical method (basing logical guesses on a known date). The following are examples taken from the children's interviews when they were asked, "When did the story of Passover happen?" Each response is to an individual question provided by different children.

"In
the 90s or something"
"3
or 10 years ago"

"103
years ago"
"My
mom was born in the 19... I do not know exactly" and "I was born in 2003"
"In
the 80s"
"A
thousand years ago", "a long time ago like 80
hundred or 70 hundred", "before I was born in 2002"
"My
mom was born in 2001 maybe she was alive"
"Before
I was born was like 2000" and "My grandpa is 54 and grandma is 66 and I
think they were born"

Usage of Qualitative Terms

This study found that children's
qualitative descriptions of time periods are very general. The children did use
a variety of six terms to describe time periods. These terms include "very old,
old time", "long time ago", "a long, long time ago", "a short time ago", "a
long time before I was born", and "didn't happen too long ago".

An example of children's qualitative descriptors occurred on March
13th. Four children were discussing
hieroglyphics.

A
child looking at a prop in the center says, "That is not Hebrew".

Another
child says, "That is pyramid writing".

Teacher
(who has been rotating from center to center interjects)- "that is a special
type of writing called hieroglyphics that they used in Egypt".

C1:Â Â Â Â Â You mean like this writing was 300
hundred year ago?

T:Â Â Â Â Â 3000 years ago.

C1:Â Â Â Â Â I was close to it.

C2:Â Â Â Â Â That is old writing.

C3:Â Â Â Â Â That is very old.

C1:Â Â Â Â Â Old writing is supposed to be old, right?

Contributing

Factors to the Logico-mathematical Thinking

Comparison of Previous Studies

Sixteen previous studies were found which discuss temporal understanding. For a detailed comparison, the work of Barton and Levstik (1996) and Muller (2010) can be consulted. Two areas that are particularly relevant to this research included contextualized questions and the usage of dates.

Contextualized Topic.

Two previous studies asked a very similar interview question to the current study. Oakden & Strut, (1922) and Bradley, (1947) asked children if their mother or their grandmother were alive during the time of Robin Hood. Oakden & Strut interviewed 12 five-year-old children. The current study interviewed 11 children. Using percentages in their findings Oakden & Strut reported that 34% of five year olds responded that their mother was alive during the time of Robin Hood and 42% identified that their grandmother was alive during that time. In the current study, 18% of children responded that their mother was alive during the times the Jews were in Egypt and 18% responded that their grandmother was alive.

Bradley (1947, p. 71) asks the same "Robin Hood" question as Oakden and Strut but does not provide the results of the five-year-olds' responses. He sums up their abilities by stating that five year olds "have the merest rudiments of conventional time knowledge" and "that not until 7 years does the child attain any conception of long periods of years" (p. 73).

If children in this study seemed to use more logical-mathematical knowledge than children in other studies, then the question is why would this be the case? One answer to this question may be that the children's familiarity with the topic of the questions provided them with a context that freed them to operate at a higher level of reasoning. The topic of the current research, Passover, was a story known by every child. The children were asked multiple questions to verify that they were familiar with the story, events, and characters. Removing the variable of children not knowing the event in question allows children to focus on the main question at hand (an understanding of temporal time). Furthermore, this was not only an event that the children knew, but also one with deep cultural ties. Even the students who were not being raised in the Jewish faith had been immersed in classroom and school-wide activities and some participated in extra curricula Passover activities. Their knowledge and connections to the topic removed the variable of wondering what the event described and allowed them to focus on figuring out who might have been alive at that time.

The idea is supported by Oaken and Strut (p. 312) and Bradley (p. 68) reporting that there were children in their study who had never heard of Robin Hood. The interviewers provided the information to the children that "He was a robber who lived in the forest in 1187". As mentioned previously, when one introduces multiple unknown variables (an unknown character like Robin Hood and unknown issue of temporal time) the child will find it more difficult to use logico-mathematical knowledge. This could result in the child guessing an answer

without reasoning. This might explain why Oaken and Strut had only right or wrong responses. They coded for right, wrong, absurd, or no answer, yet the answers produced by five year olds were only right or wrong. Perhaps as the children were presented with an event that was not familiar, they did not have the mental schema to create a logico-mathematical answer and therefore relied on social knowledge of either answering yes or no without the ability to deduce a logical or reasoned response.

Use of Dates

Another area that is similar in previous studies and the current study is the children's ability to use dates. Oakden and Strut (1922) found, "From 4-6 year olds there is practically no knowledge of the year" (p. 315) and they wonder if even older children who could state a year have real chronological understanding. Barton and Levstik (1996, p. 435) state that many kindergarten children in their study refused to participate when they were asked to provide dates. They concluded that children this age when willing to assign dates, "appeared to be guessing, and the dates they assigned for most pictures seemed to be chosen at random." As discussed above, the current study provides some evidence that young children use logico-mathematical in constructing usage of dates.

Pedagogical Implications Related to Historical Temporal Time

This current research focuses on how children think and construct knowledge. These findings can be used to guide educators as they make curriculum decisions in regards to choosing topics of study and the experiences. The findings in this study support a paradigm change from focusing on memorization (social knowledge) to realizing the great abilities children have in making cognitive connections (logico-mathematical knowledge). These findings seem to support the advantages of focusing on topics that are culturally contextualized in children's lives. Seefeldt (2006, p. 68) states, "By beginning history with children's own past, the study of history connects each child with his or her roots and develops a sense of personal belonging in the great sweep of human experiences." Wadsworth (1978) concurs and adds, "historical knowledge has its roots in concrete experiences. Knowledge never quite escapes the constraint of experience" (p. 189).

For Jewish educators the importance of contextualizing a social studies topic of study is critical. Culturally contextualized topics of study provide shared experiences for children that lead to deeper understandings. In a Jewish school many, but not all, students share culturally relevant historical events although they may have different levels of exposure to the ideas surrounding the event. Educators can create shared understandings through providing multiple experiences for children. Van Scoy & Fairchild (1993) write, "Young children's reasoning is tied to what they are seeing and experiencing; that is, young children are dependent on concrete, observable events (physical knowledge) to help them 'figure things out'." This study provides evidence to support the recommendations of those who approach learning concepts through a cognitive constructivist approach by providing hands-on, minds-on activities for all the students. As the current study shows, the more contextualized the topic of study, the greater the amount of logic-mathematical knowledge the students may apply to their thinking.

Barton and Levstik (1996, p. 443) reported that, "the findings from this study call into question the central role many historians, educators, and textbooks assign to chronology in learning

history." I would take this statement a step further and say the findings from this research calls into question the focus of educators and textbooks on transmitting or memorizing facts. As this study shows, social knowledge (which is based in memorizing information transmitted by other people) is not the key to unlock children's cognitive abilities. While this study shows that children do have an impressive amount of historical knowledge, children's ability to reason develops independently from memorizing dates and chronological history. It seems that more emphasis is needed in schools and classrooms on creating contextualized hands-on, minds-on experiences for children. As shown in this research, children will weave their own lived experiences into the classroom experiences, producing a level of cognitive reasoning that may be greater than anticipated based on previous research.

Implications and Future Research

The research results and methods of this study can benefit Jewish and general studies educators, faith based educators, and future researchers. The study confirms many theoretical and pedagogical points made in constructivist literature (Coppie & Bredekamp, 2009; DeVries et al., 2002; Fosnot, 2005; Kamii, 2000; & Von Glaserfeld, 2005). The study was prompted by the seemingly lack of pedagogical base in many Jewish early childhood centers.

Early Childhood Jewish Education: The Best Practices in Jewish Education (Holtz, 1996) provides descriptions of eight Jewish early childhood centers that conform to the Holtz's definition of schools that follow best practices. One key to best practices is defined in this report as providing a developmentally appropriate education "recognizing the unique qualities of young children, focuses on play as a way of learning, and sees experiential learning as they key to early childhood education...and have adapted what they have learned to the Jewish setting" (p. 9). Each school provides a philosophy statement in their description. Comparing the descriptions of eight programs provides a general picture of a shared emphasis in their philosophy statements. The most common descriptors were objectives and program goals. In Jewish education, these included a relationship with Jewish concepts, an emphasis on religious holidays, instruction in Hebrew and enculturation into the community. Pedagogy for most of these programs revolved around offering developmentally appropriate practices and allowing for hands on experiential activities. The next most mentioned trait was a warm environment focusing on the bond between teachers, students and families. Following this were ideas including "free play.... fewer expectations of the young children" (p. 56), usage of High/Scope, and a curriculum that was "somewhat like Bank Street approach" (p. 32).

The fact that many of these Jewish early childhood centers used the words "developmentally appropriate practice" and described philosophies somewhere between maturationism and constructivism shows the recognition of the importance of having an educational philosophy and pedagogy. However, it is troubling that these eight schools which represented "best practices" in Jewish early childhood education, did not provide much depth in describing a philosophy of education or an understanding of how children think or develop. Furthermore there was no pedagogical plan connecting the children's ability to construct knowledge to meeting the school's stated objectives.

The greatest contribution of this study is likely the specificity with which it conveys the children's ability to

use logico-mathematical knowledge in constructing historical temporal time. School systems and teachers provide abundant opportunities for students to use social knowledge. In the early years of elementary school, an emphasis is often placed on students being able to perform certain procedures and recall certain knowledge without understanding the large ideas behind the knowledge. Ginsberg & Oppen (1979) state, "In school, experimentation is often discouraged entirely... Under these circumstances, the child learns very little, becomes disinterested, and loses motivation." (p. 226) This seems even more so in faith-based schools, where researchers have found that they "embrace a teacher-centered, didactic approach over a child-centered, constructivist pedagogy" (Berliner 1997; Lederhouse 1998; Knowlton, 2002). Since the study showed children's ability to think in logico-mathematical ways, it makes sense for Jewish and general studies teachers to facilitate classroom environments and explorations that help children to construct new knowledge by providing increased opportunities for logico-mathematical thinking.

This study also supports the children's abilities to exhibit higher reasoning skills when the topic is contextualized in their lives or when they are immersed in the topic during class time. An insight this study offers is to explain why contextualized topics lead to adaptations of mental structures that underlie the children's ability to use logico-mathematical thinking. This study indicates that contextualization likely decreases the child's need to focus on understanding unknown facts (or variables) about the situation. This understanding of the effect of reducing an unknown variable through contextualization can assist teachers as they choose topics of studies and the explorations within these topics.

Research that might build or expand on the findings of this study includes using the historical temporal tasks in the current study with other age groups of students in Jewish schools. A further application is to use these tasks with children from orthodox day schools in which Passover is further contextualized. Jewish educators can also make comparison studies by focusing these tasks on other Jewish holidays (i.e., Rosh Hashanah) or other Jewish historical events (e.g., sequencing images from the first five books of the Torah). Using a larger frame, Jewish educators can research the ways that using a constructivist pedagogy affects children's construction of knowledge and actions of Jewish tradition. Related research can include explorations of Vygotsky's social cultural theory and Jewish education and the dynamic relationship between cognitive and affective aspects of Jewish early childhood education.

Conclusion

Piaget (1976) towards the end of his life, writing about his research commented, "My secret ambition is that the hypotheses one could oppose to my own will finally be seen not to contradict them but to result from a normal process of differentiation." It is my ambition that this current study inspires educators to be curious regarding the wondrous cognitive abilities of children and further apply constructivism to Jewish education.

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APPENDIX A

Eight
Sequencing Images

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Dinosaur - Unknown Source

Jewish slaves in Egypt - Courtesy Tal Am Publishing

Knights - Unknown Source

Pilgrims - Courtesy Kendall/Hunt Publishing

1859 Passover DinnerÂ - Moritz Daniel Oppenheim (German, 1800-1882) Seder (The Passover Meal) (Der Oster-Abend),
Oil on paper on canvas. The Jewish Museum, New York

Passover Dinner 1920 - This picture can be found in Gefen, 1992.
P. 8.

Children's Passover - This picture can be found in Gefen, 1992. P.
36-37

Modern (Passover Meal) - Courtesy Tal Am Publishing

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