Financial Literacy Programs Targeted on Pre-School Children: Development and Evaluation

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Abstract

This report is one phase of a project that attempts to understand financial literacy education for young children, that is, the ability of pre-school age children to grasp financial literacy concepts that may increase their and their parents' financial knowledge and improve financial decisions in later years. During this phase we have searched and compiled information on financial literacy programs targeted to young (pre-school and K-3rd grad) children, the cognitive development and capabilities of children at these ages, and whether there have been evaluations of the effectiveness of those programs. Our ultimate goal is to develop and rigorously evaluate a financial literacy program for this age group that is consistent with children's cognitive abilities and the underlying financial concepts that must be understood to improve financial decision making.

Since very young children are financially dependent on parents and have few resources (monetary or property) that they independently control, financial education targeted to this age group, in contrast to older individuals, generally does not aim to teach financial facts that would immediately change financial behavior. Rather, it is generally recognized that children of this age can be taught basic concepts about monetary exchange, financial constraints, and the tools of sharing and purchase that will enable them to earlier and more easily manage later financial challenges and become more independent and financially secure spenders and savers in adulthood. It is also thought that incorporating parents into their children's financial literacy education may increase parents' own financial knowledge and make them better financial decision-makers, improving their families' financial well-being.

This review first looks at the key financial concepts that are targeted in the financial education programs aimed at young children. This includes an assessment of the financial literacy standards that are established by the States for those that have them for this young age group. We next undertake a literature review of children's cognitive ability to grasp complex concepts in general and specifically key concepts that underlie measures of financial knowledge. Both of these are important in evaluating the validity of existing financial education efforts aimed at this age group. We next discuss the issue of evaluating the outcomes of financial programs targeted on young children, whether such evaluations have been undertaken and, when they are, how data were obtained and evaluation methods used. In that third section of the report we also describe U.S. and international financial literacy programs. We emphasize that the concepts we discuss are

not just those that are typically seen as "financial" in the literature, but the underlying concepts and values that are required for financial reasoning at these ages.

Our conclusions are generally that the literature on children's cognitive development and financial literacy education are not well integrated. Few financial literacy programs are explicit about how the concepts taught and the lessons developed are expected to improve financial knowledge and rarely discuss their connection with later financial behavior. There has been virtually no rigorous evaluation of these programs. This is not to say that some of the programs we found—and there are lots of them—may not improve children's ability to later become better financial decision makers. However, financial literacy programs tend to concentrate on very concrete lessons without apparent consideration of what are the underlying concepts to be taught, the cognitive ability of children to grasp those concepts and the behavior and timing of behaviors that seek to be improved. We highlight the few exceptions.

We propose that the next stage of this project focus explicitly on:

1. What is the behavior and knowledge (outcomes) that children could usefully learn earlier and better?
2. Which programs (interventions) do this and how?
3. What is the best way (intervention method) to deliver these lessons?
4. What are the practical and legal constraints on and opportunities for the delivery these lessons to young children?
5. How can programs be evaluated, including the ability to gather data on young children's early learning on later outcomes?
6. How should these early childhood education programs targeting financial knowledge be integrated with other educational goals for that age group and with financial literacy education at older ages?

Section 1

Overview of the Project

Introduction

The literature on financial literacy is in consensus that being financially literate

> denotes one's understanding and knowledge of financial concepts and is crucial to effective consumer financial decision making. (Fox, Barthlomeae and Lee, 2005, p. 195)

Financial education has been defined to

> include any program that addresses the knowledge, attitudes, and/or behavior of an individual toward financial topics and concepts. (Fox, Barthlomeae and Lee, 2005, p. 195)

The definitions, appropriately, refer to the compelling behavioral motivations for financial education—to enable more "effective" financial decisions with the often stated-motivation to improve the financial well-being of individuals and families making those decisions. To achieve this goal, financial literacy education programs aim to increase financial "knowledge" with financial education programs generally of three types: education that offers broad financial education on savings, budgeting, investment, and credit management; education on retirement and savings; and education on home buying and management (Fox, et al 2005). Clearly, educational programs that describe financial savings, investment vehicles, credit and debt, retirement and savings, and discuss how to buy and manage home finances are not appropriate for young children. What then can financial education programs focus on for young children? This is a topic we begin to discuss in describing State financial education standards, and in the following section in which we describe programs that target very young children's education. We focus on two aspects of those programs—the "concepts" that are taught and the evaluations that have been done of program effectiveness.

Why target young children?

The focus of this investigation is on children, primarily of preschool age. This group is the focus of many financial education programs that are described in Tables 3.1 and 3.2. The assumption is that good money practices arise in part from childhood experiences and that the

> "life-long benefits of teaching children good money habits make it well worth the effort. Children who are not taught these lessons pay the consequences for a life-time" (Danes and Dunrud, 2008).

The habits and practices that are instilled in very young children about money receipt, expenditures, and savings may form the basis of good money practices when older. The Credit Union National Association's Thrive by Five educational cite perhaps best states the reason for initiating financial education early:

> Children learn about money from many sources. Long before they enter school, they observe adults using money and buying things. …What children witness affects their attitudes about what money is for. Some of these beliefs will help them as adult consumers and some will not. (CUNA, nd)

A review of financial education programs in the European Union, discussed in Section 3.2 argues that "there is only a small degree of dissent about the ideal contents of a financial literacy scheme." (Habschick et al., 2007, p. 96). We do not find this same uniformity among programs oriented towards the very youngest children. That report also goes on to say that "the bigger question is why people do not regularly apply the skills they have learnt." We hypothesize two reasons that are connected with very early childhood education. It indeed may be that financial concepts and habits must be acquired and instilled early. In doing so, however, we hypothesize it is important, first, to agree on the basic underlying concepts that when acquired early lead both to acquisition of more "adult" financial knowledge and to better financial decisions as adults. It is also important to understand how these concepts coincide with the cognitive development of young children to assure concepts are taught when they are meaningful.

Thus we argue the current focus on young children is valuable because:

1. It may be it is skills acquired in childhood and habits instilled by parents that are most important to later patterns of financial behavior,
2. Few financial education programs target pre-school children and their effectiveness is virtually unexamined,
3. Because very young children have had little experience with financial concepts, it may be underlying concepts, for example of trade and exchange, rather that the enabling institutions and practices that must be taught to them,
4. Because very young children do not interact independently with financial institutions and markets, curricula for them may have to be fundamentally different for them
5. The ability of very young children to understand basic financial concepts is likely closely tied to cognitive development which must be considered in program development, and

6. Because very young children are not required to be in school, curriculum must include parents as teachers and be attractive for adoption by the pre-schools which they attend.

Curriculum assessment:

We first explored what financial literacy curricula were available that targeted pre-school children. Section 3 presents the compilation of the programs we found in the United States (section 3.1) and in other nations (section 3.2). We examined two aspects of these curricula—the basic financial concepts that appeared to be taught and whether any evaluation of program effectiveness were available.

Section 2 reviews the current state of our knowledge about children's cognitive ability to grasp basic financial concepts. This discussion reflects the underlying assumption that drives our approach to this topic—that for the very youngest children, financial literacy education must be consistent with children's cognitive developing. For example, understanding savings and investments requires a sense of future selves that are different from but a continuation of one's current self. When do children grasp the difference between present and future? Understanding money exchanges requires a sense of giving and receiving, of fairness and trust in exchanges not accomplished simultaneously will be completed. When do children understand those concepts? Understand money transactions also requires a sense of magnitude—that value is not measured by coin size (nickels are not larger than dimes in value) and that "money" and goods can be exchanged through credit cards and checks that represent value but are not themselves the "money" behind the exchange. When do children begin to understand that exchanges involved a set of unseen transactions involving other parties?

Table 1.1. lists the concepts we propose as important components of early childhood financial education. These are derived from our own experience in financial education (Holden) and cognitive development (Kalish) as well as from sources that list essential knowledge to understanding more advanced economic or finance principles. These include the Council on Economics Education, formerly the National Council on Economics Education, (http://www.ncee.net/ea/standards/), the Jump$tart Standards (http://www.jumpstart.org/guide.html), the concepts listed at the Economic Education Web (http://ecedweb.unomaha.edu/K-12/K-5concepts.cfm) and through examining individual financial education programs that describe the underlying principles (see, for example, ASIC, 2003, discussed in Section 3.2).

In addition, a major component of our inquiry was examining State education standards for financial education. Advocacy and action for mandatory financial literacy education occurs at the state level in the U.S., because educational standards and requirements are state-level mandates and, therefore, it is states that would be able to mandate effective curricula across state licensed schools. Many have adopted standards, whether for

voluntary or mandated course instruction, that indicate learning expectations at the different grade levels.

Early in 2008 the President's Advisory Council on Financial Literacy was established with one of its directives being to "improve financial education efforts for youth in school and for adults in the workplace." One step in its process towards this goal is a call to "establish standards for the content of a sound financial education program," arguing that there is no agreement across programs on what content is necessary for effective financial education. Council meeting documents show that Council discussions centered on older school age youth and adults--their financial knowledge deficits and the financial literacy programs designed for them. In their September report to the President among their recommendations were:

> ***Recommendation 1 –*** The United States Congress or state legislatures should mandate financial education in all schools for students in grades Kindergarten through 12. For those schools without access to curricula, require the adoption of "Money Math: Lessons for Life," a ready-to-use curriculum created by the Department of the Treasury and endorsed by the Council.
>
> ***Recommendation 5 –*** The United States Department of the Treasury should promote the availability of financial education resources for parents, caregivers, and teachers to use with pre-school and early elementary school children.[1]

While the Money Math curriculum is designed for middle school students, its explicit relationship to prerequisite skills is worth noting. Each lesson is explicitly correlated with the level of knowledge and skills expected of K-12 students as set forth by the National Council of Teachers of Mathematics (NCTM).[2] Lessons describe assumed mathematical prerequisites. This is the type of explicit linking of prerequisite skills and standard goals we rarely found in the curricula we review in section 3 of this report. However, beyond calling for financial literacy education as early as kindergarten, the President's Council has not discussed curricula options, its development or means of delivery.

In only a few of the sources explored were the underlying cognitive development principles described or the way in which lessons were designed to correlate with early cognitive development explained. In most cases, however, we had to infer the underlying prerequisite principles. Often lessons were about specific financial facts or institutions or fairly sophisticated exchange transactions that would require considerable prerequisite literacy, mathematical, and reasoning skills. Where prerequisite skills were specified or standards were explicit, these were those for older elementary grades and beyond. For

[1] See recommendations at: http://www.treas.gov/offices/domestic-finance/financial-institution/fin-education/council/PACFL-recommendations.pdf.
[2] See http://www.nctm.org/standards/

example, the Jump$tart K-12 standards are for students in 4th grade and older without mention of younger ages (Jump$tart, 2007). Some educational programs were explicit about how specific lessons linked to larger financial concepts. The National Endowment for Financial Education offers a pamphlet suggesting simple exercises for parents teaching young children, with its suggested lessons organized around the basic principles of : Setting goals, Earning money, Spending money wisely (budgeting), and understanding the time value of money (NEFE, 2001). Our research team met to discuss prerequisite skills described explicitly or as we inferred from the curricula reviewed. Table 1.1 lists the concepts we inferred were important to understanding the financial literacy lessons likely to be met in later grades and to successfully negotiating the financial landscape. Around these concepts we organize the discussion of children's cognitive development (Section 2) and our discussion of program elements and evaluation issues (Section 3).

Section 2

Cognitive Development and Children's Understanding of Personal Finance

Overview

Financial literacy has not traditionally been a major focus of cognitive developmental research. In part this is due to the somewhat amorphous nature of "financial literacy"; it is not exactly clear which cognitive abilities or concepts are central in this domain. In this review we first describe general theoretical approaches that inform research on cognitive development. We then turn to empirical findings regarding children's thinking about financial topics. This empirical review can be understood on a continuum of financial relevance. First there are a number of concepts or abilities that are central to financial literacy, but are not unique to it. For example, concepts of quantity and time, and abilities to plan and delay gratification are clearly central to financial literacy and financial behavior but are important in non-financial contexts as well. At the other extreme are concepts and abilities that are more characteristically financial. For example, researchers have explored children's understanding of money and wealth. An intermediate class of concepts is broadly "economic" in that they involve the distribution of resources. Ideas about exchange, and understanding of value are certainly basic to financial literacy, but are broader. Exchange and value frequently, and in modern Western adult society perhaps typically, are understood to be "financial", but are certainly not always so.

A challenge in preparing this review is that there is an inverse relation between the amount of research literature and its direct relation to financial literacy. There are large literatures on general topics, such as number or quantity, and quite sparse literatures about specific topics such as concepts of income distribution. In this review we concentrate on the intermediate concepts that seem both fundamental to financial literacy and generally important.

General Conceptual Development in Children

The research on financial literacy considered in this review represents three distinct and general theoretical approaches to cognitive development. On tradition of research, identified with Jean Piaget, explores general developmental processes and constraints that characterize children's thinking at particular stages of development. A second tradition emphasizes the role of experience and learning. Children's thinking about a given is a function of the information available to them and the beliefs they have formed in response to prior experience. A final theoretical perspective focuses on maturation, especially brain development. Especially in one area relevant to financial literacy, planning, changes in the developing brain seem to have very important implications for children's abilities.

Piaget. Classically, conceptual change in childhood has been explained through Piaget's theory of cognitive development. According to Piaget (1968), individuals learn by reconciling inconsistencies in understanding. He called this process equilibration. If something is not understood, a person is said to be in a state of disequilibrium. As children equilibrate new concepts, they go through four stages of development, including sensorimotor, preoperational, concrete operations and abstract thought. These stages are distinct, consecutive and necessary, that is, all children progress through the stages in order and no stage may be skipped.

Infants up to the age of 2 are said to be in the sensorimotor stage of development. They are learning about the world through sensory interaction. The end of this stage is marked by the presence of object permanence, or the understanding that an object continues to exist even when it is out of sight. From approximately 2 to 7 years of age, children are said to be in the preoperational stage of development. In addition to now having the ability to use and understand language, they experience the world from a very selfish, or egocentric perspective and tend to only be able to understand one feature of a situation or object. The end of this stage is marked by an understanding of conservation, or the idea that a physical object maintains certain properties even when surface properties are manipulated (i.e. two cups of water will always have the same volume, whether it is poured into a tall, skinny glass or a short, wide glass). Children ages 7 through 11 are in the concrete operational stage. They can now reason about the world by understanding multiple dimensions of a problem or situation, provided that situation is made concrete. It is not until formal operations, around age 12 that individuals are able to reason beyond

concrete examples. In this final stage, hypothetical, philosophical and scientific (i.e. hypothesis testing) become integral in learning about the world.

The preoperational stage of development will be central to the ideas presented in this paper. Firstly, at the beginning of this stage, children experience the world in a very egocentric manner. Occurrences relate to the self only and other people's perspectives do not factor in to their reasoning. It stands to reason that reasoning about personal finances in this stage would be largely limited to the effect that any decision or state of being would have on the child directly.

Secondly, children in this stage are limited in the number of dimensions in which they think of problems. Most often, they only reason about one dimension at a time. For example, if given a balance scale problem where both the amount of weight placed on each side and the distance from the fulcrum can be manipulated and asked to decide which side will descend, 5- and 6-year-old children will only focus on the amount of weight. The side with the most weight present will go down. They seem unable to consider both weight and distance in making their decision (Inhelder & Piaget, 1958). Imagine a child of the same age now reasoning about money. If given the choice of 10 pennies or one quarter, the child will likely choose the 10 pennies because 10 is more than one. It is difficult for them to account for both amount and relative worth of the coins at once.

Thirdly, much reasoning about personal finance involves thinking about concepts that are not concrete or visible (i.e. bank accounts, credit, profit of store owners, etc.). According to Piaget, preoperational children tend to be 'perceptually bound': They focus on what is visible or apparent in experience. Young children have difficulty conceiving of unobservable causes and abstract properties. For example, one's future state is a fairly abstract concept, especially when contrasted with the here-and-now present. Minimally, Piagetian theory suggests that young children will tend to focus on the immediate and observable. A stronger claim is that preoperational children are actually unable to mentally represent abstract concepts such as value or future.

Theory Theory/ Core Knowledge. While Piagetian theory was hugely influential in defining the field of cognitive development, its specific empirical claims have not fared well. In particular, the characterization of preschool-aged children's thinking is too strong and overly restrictive. Current theories of conceptual development are more optimistic and argue that age or stage matter far less than engagement with particular theories about the world. One response to this challenge to Piagetian theory is what has come to be called 'Theory Theory.'

According to theory theorists, children change their concepts of the world by modifying theories they create through their interaction with objects and situations. Theory theorists differ in their emphasis on innate constraints. Most suggest that children are born with

predispositions that constrain learning from the environment. Development is a process of interaction between innate 'core knowledge' and experience. Typically, core knowledge will be a starting point in conceptual development: a core that influences but does not determine the process and end-state. However, in contrast to Piagetian stages, core knowledge is domain-specific; the biases or constraints related to learning about object motion may not be related to those involved in learning about number or human behavior. Thus the nature of conceptual development in a given domain is a matter of empirical investigation. Critically, theory theorists are not committed to general constraints, such as egocentrism or centration. In particular, core knowledge, and the theories children develop, may involve abstract entities, hidden causes, and complex relations. The relation between children's thinking and adults is best understood on analogy with the history of science in which one theory is replaced by another, rather than as a process of increasing cognitive complexity or logical power.

As may be obvious to anyone who has spoken with a young child about money finances, or any number of other realms, children's initial theories about such concepts are often wrong, incomplete or based on misunderstandings. These initial theories are called naïve theories precisely because they are often based on limited interaction with the concept at hand. Critically, development occurs as result of encounters between children's existing theories and the world. Although accepting the basic premise that children learn from experience, the theory theory continues the traditional Piagetian view that learning is mediated by cognitive state. Children learn from experience, but what they learn from a given experience depends on what they already know or believe. The task of cognitive developmental research is to diagnose children's intuitive theories and to understand the kinds of experiences that lead to those theories. A secondary goal, especially relevant to education, is to identify opportunities to improve children's theories. Based on how children are thinking about some phenomenon, it should be possible to identify critical evidence or experience that will move them to a more mature conception. Critically, the significant evidence will depend on the nature of the existing theory.
Another advantage of the theory theory approach over traditional Piagetian work is that it naturally accommodates individual and cultural differences. On Piagetian theory culture and experience could accelerate or retard development, but the course of development was universal. Theory theory suggests that all people may start from a common point, the core knowledge, but specific experiences will lead people to develop distinct theories. The common analogy is human languages. Many argue there is a core set of cognitive structures that constrain human language. Yet there is clearly significant diversity and development. The challenge is to understand cultural and individual differences as variations on a common theme; what is the core similarity and what kinds of experience produce the distinctive features?

Therefore, the theory theory/core knowledge view hinges on children's development of theories about the world around them. Teaching according to this framework requires knowing what children's initial, or naïve theories are. This can depend upon the cultural

upbringing of the child as experiences build theories. It will then be necessary to create a learning environment that challenges any naïve theories that may be incomplete or incorrect while still incorporating them into the learning process. Learning in this framework is about modifying theories and that process of modification is important, not just the end product.

Brain/Executive Function Development. Neuroscience and an understanding of the developing brain are becoming important influences on theories of cognitive development. Work in cognitive neuroscience is has been quite influential in several areas related to financial literacy, notably the development of number and quantity concepts. However, much of the research is at a very basic level, removed from higher-order or more complex cognitions involved in financial decisions. One notable exception is work on the development of executive function. Executive function refers to the ability to exercise cognitive control, to direct attention, to focus, and to select the objects of thought. Executive function is central to planning. In this review we will focus on the role of brain development for financial literacy primarily in terms of executive function.

The central process in brain development is connectivity of neurons. As currently understood, thinking is a process of sending activation from one neuron to another. Learning and memory involve changes in those patterns of activation and transmission. The developmental process most relevant to this review is the myelinization. Myelin is a coating around neurons that greatly improves the speed and efficiency of connections. Critically different parts of the brain become myelinated at different points in development; areas responsible for executive function (frontal lobes) are not fully myelinated until late adolescence. In the young child, the frontal lobes are not fully connected or integrated with other areas of the brain. Maturation of the frontal lobes is often associated with children's increasing abilities to plan, to delay gratification, and to inhibit impulses, in short, with executive function.

Development of Personal Finance Concepts

Number: The concept of number, or having a number sense, is important to personal finance literacy in the following domains: understanding more or less, production/ consumption, patterns or measurement, and data analysis.

Piaget. Though Piaget's theory does not explicitly address innate concepts of number, he does specifically address the concepts of symbol use and centration. During the preoperational stage of development, children gain symbolic understanding. This should allow them the ability to represent the amount of a set of objects with a written number. Much as the written or spoken word "cat" represents a four-legged, furry, meowing creature in the world, a written or spoken "5" should represent the number of M&Ms in a set on the table in front of a child. Attaining these simpler mental representations will

allow children to more easily work with and understand numbers and properties of numbers as well as learn to work with them.

Preschoolers, however, still have trouble comparing number to other properties of a set of objects (Piaget, 1965). For example, 4-5 year old children will often say, given two rows of 5 objects, where one row of objects is spaced widely and the objects in the other row are pushed closely together, that the widely spaced row of objects contains more objects than the closely spaced row of objects. This phenomenon remains in tact even when the child is encouraged to count the objects in each row. Here, the child is conflating amount, or number with size, or length. This might effect how a child reasons about two groups of coins, for example. A row of 5 widely spaced pennies may seem like "more" to a preschool child than a row of closely spaced pennies. A third variable will come into play concerning coins when we consider value of differing coins below (see Money and Income).

Piaget's concept of centration also directly applies to a child's development of number concept. As exemplified above, Piaget performed several classic experiments on children's ability to focus on more than one aspect of a problem at a time. A child may have been asked to reason about volume, mass or number while also considering that another aspect of objects might vary, such as length or height. Children who have a difficult time taking both aspects into account simultaneously are said to centrate, or only focus on one aspect of the problem. Centration is a hindrance because it only allows children to represent part of a problem at a time. In respect to number, most children in the pre-operational stage of development will ignore number in favor of overall size of the set, as explained above. It is as if the two senses of "bigger" become conflated.

Theory Theory/Core Knowledge. Core knowledge is particularly good at explaining number and mathematical understanding documented in very young infants (Spelke, 2000; Wynn, 1995). It stands to reason that being able to distinguish between 'one' and 'more than one' or being able to tell when one object should be missing is adaptive. If an individual got separated from the clan, being able to tell whether one or three warriors from another clan approach, or seeing that one of two warriors left for another purpose would be quite useful in determining one's prospect of survival in an altercation. Therefore, an innate sense of number is argued to be one of the important innate domains by core knowledge theorists (Spelke, 2000). In fact, this number sense is detected in infants as young as 6 months in a study conducted by Wynn (1995). Infants were repeatedly shown instances of a particular number of objects on a screen, for example, 2 circles. When they habituated to these cases (i.e. began looking away because nothing new or interesting was happening), the experimenter then either showed another instance of 2 circles or an instance of 1 circle. The infants that saw 1 circle (a different number) looked at it longer than those who saw more of the same 2 circles indicating that infants do perceive a difference in small numbers of objects.

We have seen that some theorists argue a sense of number is innate to individuals and that even very young infants appear to exhibit sensitivity to differences in small groups of numbers (Wynn, 1995). Wynn (1992) has also argued that, in the same way a sense of arithmetic is innate. In this study, 5-month-old infants are shown 2 Mickey Mouse dolls and allowed to look at them until their interest wanes (habituation). A screen is raised obscuring the dolls and the infant sees an arm go behind the screen and remove one Mickey Mouse doll. When the screen drops, there are either still 2 dolls or just one. The infants that see just one doll spend far less time looking at the stage because they are not surprised by this result. The infants that see two dolls still there, however, stare much longer, presumably trying to figure out how an extra doll go there. Variations of this set-up were performed, but all conclusions pointed to infants looking longer at situations that did not make mathematical sense.

Beyond infancy, children's knowledge of numbers expands to include elements of counting and relations between amounts, including equality. Around two and a half years, children are able to distinguish counting words from other labeling terms (Markman, 1989). They know that, when asked to count a set of blue balls, counting words represent the amount in the set and not another attribute, such as color. By preschool, many children are able to articulate rules of counting (Gelman & Gallistel, 1978). For example, they understand that when counting a set of objects, each object gets counted once. Younger children can often be seen counting objects in a set more than once and either not knowing when to stop or stopping arbitrarily. Other counting principles acquired by preschool include knowing that numbers are stated in the same order all the time (stable order), that one can count up and down or side to side and that order does not matter as long as each object is counted once (order irrelevance), that anything can be counted as long as the items in the set can be distinguished (abstraction) and that the last number stated/counted represents the total number in the set (cardinality).

According to theory theorists, children's developing concepts of number from infancy can be explained by their experiences in the world. Children are likely to gain knowledge about counting through real world encounters with the phenomenon. Young children are often asked to count things (days of the week, pieces of food they must eat to get dessert, cars in the driveway, etc.). Additionally, they are exposed to situations in which experienced counters perform the act for them. The principles of counting are reinforced via these experiences and, thus so are new theories that children are making about numbers and counting.

The trouble young children have reasoning about number and other object properties simultaneously could be due to inefficient experience with this situation. Perhaps children have not had enough encounters with situations requiring them to distinguish between the two at such a young age. Theory theory suggests, however, that exposing

children to these situations and reinforcing how properties such as size and amount interact should allow children to begin reformulating current theories.

Summary. At least in a very general sense, the concept of number has been shown to be innate. Thus, we should be equipped from a very early age to reason numerically and mathematically about the world around us. Some constraints still exist as the complexities of numbers are revealed, but knowing what these constraints are can help inform an appropriate curriculum for pre-operational children. For example, knowing that children may have a hard time keeping track of number and size at the same time *and* knowing that real-world experiences can help children overcome misconceptions, a lesson on number of various coins could provide many opportunities for preschoolers to learn about number of pennies vs. number of dimes.

Time: In order to gain an understanding of personal finance and economics, individuals will need to hold an accurate representation of time. The critical parts of time concepts for the purposes of this paper are not so much whether children understand a clock or how seconds, minutes and hours relate, rather the relation of past, present and future. Thus, time will be important to financial literacy in the following domains: thinking about the future, saving/deferring spending, investing, building assets and the time value of money.

Piaget. Once again, Piaget's theory can address conceptual development in the arena of time by focusing on centration. Piaget studied aspects of children's thinking of time, such as duration, by asking children to look at samples of papers from others who were instructed to start and stop drawing lines at the same time. The children specified that the person who produced the paper with more lines on it must have drawn for a longer time. These children were conflating duration with speed. In fact, both drawers engaged in the activity for the same length of time, one merely drew at a faster rate.

Another important aspect of time as it pertains to economic and financial understanding is the future. The concept of the future, however, is a very abstract one. Thus, to Piaget, who claimed that true abstract thinking does not occur until much later in life, it likely would not come as a surprise that children younger than 7 have trouble with this understanding. Making the concept more concrete, by linking it to a concrete image many children have in their heads, such as a birthday or Christmas (Friedman, 2000), would help to take away its esoteric nature and ground "future" in something more real to children.

Theory Theory/Core Knowledge. Though the focus here is on how children understand past, present and specifically future, the very beginnings of an understanding of time have been argued to have their roots in more basic functions each human is born with. An infant experiences regularities in heartbeat and breathing, for example, which becomes a base for experiencing the regularities that occur in the passage of time

(Harner, 1981). Harner also suggests that as children age, they begin to realize that an action that elicited a response in the past is likely to elicit that response again in the future. In this way, even very young babies are beginning to conceptualize past, present and future.

Core knowledge theory could easily account for an argument that some sense of time is innate. Time passes with regularity, just as many biological functions operate with regularity. It would be adaptive to be born with some sense of this regularity existing throughout life. Furthermore, theory theory suggests that as children become more experienced with time, their ideas about how time works will become more sophisticated. Thus, noticing regularities in the fact that cause and effect in the past is the same as cause and effect in the present or future is simply a necessary step in formulating better time theories.

Brain/Executive Function. Given that an understanding of the future is necessary to be able to plan and to delay gratification, the role of brain and executive function development is important to children's developing concepts of time. Recall that delay of gratification refers to one's ability to refuse a small reward now for a larger reward in the future. According to neuroscientists, neither an understanding of the future nor an ability to delay gratification exist in any meaningful or useful way prior to between ages 3 and 4. But as physical neuronal development in the brain accelerates, these tasks and understandings become much easier for children.

A child's concept of the future will be particularly relevant in this discussion because much understanding of personal finance and economics relies on knowledge about now versus later (i.e. savings, investments). As explained above, more sophisticated concepts of time do not develop until much later in life. Even in the best of situations, it is not until 4 years of age that children begin to distinguish between two future events, and this reasoning is only present for special events, such as birthdays or big holidays like Christmas, that are 1 to 2 months away (Friedman, 2000). This explains why preschoolers seem to always be able to explain and relate to events close to their birthdays. A program to teach children about personal finance could use this ability to its advantage by creating special event days, such as the day each month that the child gets to look at their bank account information.

Summary. When considering children's understanding of personal finances and their concept of time, the most relevant feature is likely an understanding of the future. While many young children, even beyond preschool, have trouble understanding the future, research has shown that their knowledge can be improved by personalizing it. Given that children understand the future better when it is related to major life events, turning a monthly trip to the bank to check statements into an event might help children develop a greater concept of the future, especially related to finances.

Money and Income: Several specific concepts pertinent to personal finance knowledge fall under the conceptual category of money and income. These specific concepts include bills and coins (the value and use of), functions of money, money as storage of value, alternative forms of "money", sources of money and income and what it means to earn income.

Piaget. According to this theory of cognitive development, children in the preoperational stage of Piaget's development should have a fairly difficult time understanding the different dimensions money has, according to the theory. For example, money comes in different shapes, sizes, colors and textures. We have already seen that preschool children have difficulty considering even two of these aspects at the same time (Piaget, 1965). To complicate things, money carries the additional property of value; a dollar is more valuable than a quarter is more valuable than a dime and so on. These two aspects, however, physical composition and value do not affect one another. In other words, it is not the case that because a coin is bigger in physical size that it is also bigger in value. Similarly, it is not the case that paper money is always greater in value than metal money (1 silver dollar = 1 dollar bill).

In fact, Strauss (1952) has shown that children DO have trouble keeping various aspects of money separate in their heads. For example, preschool age children often reason that a coin that is larger in size must be larger in value as well, such that a nickel should carry more value than a dime. Grunberg and Anthony (1980) also showed that children younger than 6 will choose 100 pennies over a 1 dollar bill when given a choice, despite being told that the two quantities are equal in value. This trouble in understanding two dimensions of an object at the same time is another example of Piaget's concept of centration.

Theory Theory/Core Knowledge. The theory theory framework of conceptual development postulates that children change concepts based on experiences within a particular domain. Thus, more exposure to various types of coins and the fact that the size or composure of a coin does not affect value could allow children to arrive at that correct concept more efficiently.

Cross-cultural research on children's understanding of money supports the idea that the particular interactions children have in this domain affect their understanding of money and economics. For example, in a study of South African (Bonn & Webley, 2000) children from either rural, urban or semi-urban areas of the country, children were asked where money comes from. Many 7 year olds cited "God" or "bosses", or even "whites," while older children, between 8 and 14 years, cited "banks" or other institutions. Due to the relatively secretive nature of the government as it is involved in finance and economics, however, it is not surprising that children do not acknowledge its role until much later in life. The particular way in which their environment is set up does not allow for everyday experiences in which one might reason about the role of the government.

Similarly, the particular experiences children have with obtaining money can affect their assessment of where money comes from. For example, a young child who accompanies his parents to an automated teller machine to receive money might infer that the machine makes the money (Claar, 1995). Taking a child to visit a U.S. mint or even introducing them to the idea via a book about mints could offer them an opportunity to think differently, perhaps more globally, about where money comes from.

Summary. Research on children's concepts of money and income seems to be driven by two main issues; keeping facts about money straight in their heads and being exposed to those facts in the first place. It stands to reason that giving children more exposure to money and transactions surrounding money would afford them more opportunities to learn the facts and develop a more sophisticated conceptualization of the medium. Thus, this research supports the need for more education and educational programs in the area of personal financing.

Markets and Exchange: Understanding markets and the concept of exchange are two large domains within personal finance literacy and involve many social aspects that could apply to the community at large. Some of the specific concepts involved in this domain are prices, equilibrium pricing, supply and demand, shortages and surpluses, profit, competition, goods and services, resources (human/natural/capital), debt, credit, bartering, trade, trust, cost of borrowing, fees and interest rates, spending, managing money, consumption matching income, property ownership and transfer of ownership, taxes and specialization.

Piaget. One important aspect of children's burgeoning understanding of economics and personal finance is the concept of exchange. In an exchange, one entity can provide an object to a second entity if that second entity provides an object in return. They key is that these objects (services, favors, etc.) must be equal in value. Though there are many societies and situations in which bartering with non-monetary objects is common (i.e. doing housework for a friend if they agree to provide child care), money is often cited as a key element in exchange situations. Berti and Bombi (1981) examined children's understanding of money in this capacity and found that their reasoning was constrained by their particular Piagetian stage of development.

When asked to participate in a mock consumer/storekeeper exchange, young children in this study had a hard time doing so correctly. Very young children, 3-4 years of age, knew what money was and could explain that it is used to buy things, but often took merchandise without paying in the role-playing situation. As children age, they become more aware of the rules that are involved in exchange such that slightly older children (4-5 years) paid for their purchases in the mock store, but did not seem to understand that money has different denominations, or if they did understand that, they tended to assign one denomination to a single item of purchase. By 5-6 years of age, children understand

that some denominations do not carry enough value to buy some things, but even when that was the case, in the mock store, when the children were the storekeeper, they still gave back change because that is 'what storekeepers do'. It is not until children approach 7 years of age that they begin to follow the logical rules of exchange (i.e. understand money can be exchanged for goods and that it is only when change is provided only when denominations larger than the cost of the item are given). The logic involved in keeping these rules straight and in mind simultaneously is not present according to Piaget until the concrete operational stage around 7 years of age.

Theory Theory/Core Knowledge. Preschool children's difficulties in understanding exchange relationships can also be explained by experiences characteristic of this age child. Fiske (1991) purposes that people interact in four significant ways: communal sharing, authority ranking, equality matching and market pricing. The most relevant relationships for understanding children's concepts of relationships in exchange are communal sharing and market pricing. Communal sharing, or considering every member of a category equal, is often used within families when children are young. For example, many young children receive the goods and services they need from or through their parents without considering the cost at hand. Exchange is thus much more about receiving than a balance between give and take. Exchange relationships in the extra-familial world, however, are far more often based on market pricing relationships. In this type of relationship, goods or services received correspond to an appropriate cost. Young children, particularly those too young to get an allowance, have very little experience with this type of relationship, thus it is a more difficult understanding to gain.

Moving to a market pricing understanding of exchange relationships will require reasoning about equality and inequality as it pertains to the parties involved. In market pricing, the cost rendered and services provided must be equal in some sense. It seems reasonable to ask a neighborhood teenager to shovel the snow off the drive one morning in exchange for twenty dollars. It seems unreasonable, however, to expect the teen to remove snow all season for a total of twenty dollars. In this second case, the cost paid for the services do not compensate for the effort or work put forth to provide those services. According to Pinker (1999), we are hardwired to detect these kinds of inequality because throughout evolution, detecting cheaters has been beneficial, even necessary at times, for survival. However, if as children this is not reinforced, rather the opposite seems to be the norm (neither children nor adults in a parent-child relationship seem to focus on the effort put forth by the parent to provide for the child in an attempt to create equity) in the form of communal sharing, it may be more difficult for children to activate this type of reasoning, even if it is thought to be innate.

Understanding markets is one domain for which knowledge of exchange can be useful. Recall that core knowledge theory purports that concepts develop in a domain-specific manner in accordance with experience. That is, a child may have a specific naïve theory about number, rather than a general understanding of symbols. This is often the case in

children's understanding of markets. One particular domain that produces very specific naïve theories is supply and demand (Siegler & Thompson, 1998). Very young children, 4-5 years of age do not consider supply when reasoning about a market system. These children can often understand and explain demand, but it is not until around age 8 that supply is integrated into the equation. According to Siegler and Thompson, demand is more accessible to young children. It is easier to see examples of, effects of, and change in demand. If a young child hears that all of a sudden a lot of kids want to buy a doll, it might make sense that the storekeeper would be able to sell more. The concept of supply, however, is less obvious and accessible to young children. Children may have less experience supplying goods than they do demanding them. Supply is also a trickier concept because whereas demand is directly related to how much the storekeeper will sell, supply and sales have an inverse relationship.

Other key domains in market understanding, such as the concept of profit, have been studied, but are not understood until children are much older, around 11 years of age (Jahoda, 1979). Children younger than this conceptual shift tend to think that items are sold at the same price as they are purchased. Integration of the two concepts constitutes the conceptual change. Work in this field suggests that children require experiences comparing and contrasting these two concepts in order to successfully change their overall concept from disjoint to connected systems of purchase price and selling price. This will lead to an understanding of profit (Berti & De Beni, 1988, Webley, 2005).

Summary. Preschool children have a very elementary (i.e. sometimes incorrect, sometimes incomplete) understanding of how exchange and markets work. Many children of this age still have trouble correctly identifying the role of stores or salespersons and while they can sometimes articulate the purpose of demand in a market, they are less able to reason about supply. Much of the research in this area that exposed these beliefs used a mock-store environment, suggesting that this might be a particularly useful method for documenting children's beliefs and naïve theories in an educational setting in order to address inconsistencies or misunderstandings. Furthermore, it could be useful in providing additional experiences with troubling areas, like the purpose of a storekeeper, to allow for more conceptual change.

Institutions : Given that many aspects of money and the use of money cannot be understood without considering the institutions that help manage that money, this domain is particularly relevant when considering children's concepts of finance and economics. In addition to financial institutions like banks, we must also consider entrepreneurs, insurance and insurance agencies and the roles or jobs of family members in financial situations.

Piaget. In an interview of 180 school children in South England, Furth et. al. (1976) explored young people's understanding and views of social institutions such as families, government, doctors and shopkeepers. They found that development of these concepts

followed a generally Piagetian framework. The first stage, most prominent in children younger than 6 years of age consists of voicing knowledge about facts of a social situation. A child of this age might explain that the storekeeper's job is to provide goods/services and money (in the form of change). The child may also explain that the shopper gives money to the storekeeper, but there is no integration of these two concepts (i.e. that change is provided when the shopper hands over more than the cost of the item). It is not until concrete operations around age 7 that children begin to integrate an individual's use of money to paint a more complex social picture. Furth et. al. give the example of a bus transportation system. One participant posited that passengers give the bus driver money and the bus driver can then give that money to the man who sells gas in order to purchase gas for his bus. Thus, this child does not just portray facts of the situation, but makes inferences as to the usefulness of each fact. In concrete operations, children also more often state that a person's job is a result of the person's interests and education or experience with the position, rather than being acquired by chance, again inferring about more than just surface features of the situation.

Theory Theory/Core Knowledge. One social institution of importance to this review is banks and the concept of banking. Banks as institutions, however are fairly complex. It is generally proposed that a reasonable understanding does not emerge until around 10 or 11 years of age (Jahoda, 1981; Ng, 1983). However, Ng (1983) showed that children in Hong Kong tend to have better understandings of the banking system earlier in life than American children because of their particular experiences with banking. Similarly, children in Japan had an even less advanced view of banking because of very few experiences with the social system (Takahashi & Hatano, 1994). Experiences with banks or banking may not only differ between cultures, but also between class systems within a culture. In South Africa, Bonn and Webley (2000) found that children living in rural areas of the country, where banks are less frequently found, have the least comprehensive understanding of the institution. Therefore, while an understanding of banking tends not to emerge until later in life, research about older children's understanding shows that the more experience children have with this social system, the more quickly they can develop competent concepts.

Summary. Young children often have a difficult time understanding the intricacies of social institutions. Pre-operational children often explain them with a series of facts according to their own experiences, but integration of these facts into a concept of a social system as a whole does not occur until concrete operations around the age of 7. Furthermore, the less experience children have with these institutions and their place in society, the less knowledge they have about the effects of institutions, such as banks. Again research here suggests that exposure to mock situations could be useful in teaching about how institutions work. Letting children pretend to be bank tellers could not only teach them facts about how banks work, but could give them valuable exposure to parts of the system they might not normally observe as a bank customer.

Choice: The bulk of this review considers children's conceptions of entities or processes involved in thrift and financial literacy. Skills and abilities are equally important components of financial literacy. Here we focus on a critical set of skills involving choice and decision-making. In personal finance, choice involves managing information about scarcity, opportunity cost over time, degree of perceived necessity, thrift, budgeting and financial risk. Children's understanding of these elements will ultimately be important as inputs or influences on choice behavior. Having reviewed the literature on these inputs, we now turn to the question of choice itself. How do children make decisions and select alternatives? Developmental research in this area often focuses on key ideas such as delay of gratification and self-regulation.

Piaget. When we make choices in life, we inevitably need to pit one option against another and this can often mean suppressing some immediate urges, sometimes temporarily, sometimes more long-term. Therefore, the development of self-control becomes central to making choices, especially those that involve a more distant future. Preschool age children have a hard time making a choice between a reward offered immediately or one promised in the future when that future reward is greater (i.e. a desirable piece of candy later or a merely satisfying cracker now) (Mischel & Ebbesen, 1970).

Piagetian theory could explain this phenomenon via the concept of centration. Imagine a 4-year-old faced with the decision of whether to take a small reward immediately or to wait for a larger reward in 5 minutes. The child will have to hold several aspects of the situation in mind at one time: the type of reward, their desire for each type if they differ, the size of the reward, the time at which the reward will be received, etc. If additional consequences are added in, such as a parent who will be disappointed if the child takes the small reward immediately, the situation becomes even more complicated. In the pre-operational stage of development, children usually only consider one aspect of the problem at a time. Thus, the fact that they can have a reward now, regardless of the relative size or desirability compared to the later reward, might be the salient problem feature on which they centrate. Other relative aspects may be ignored because of the constraint of this cognitive mechanism.

Theory Theory/Core Knowledge. Several studies have shown that younger children can be helped to make more efficient choices in delay of gratification situations if they are taught ways to help cope with the delay. For example, if they are taught to take their mind off of the desirable immediate choice (Mischel & Moore, 1984) or the most desirable attribute of that choice (Michel & Baker, 1975), they have an easier time delaying. In a personal finance situation, one might imagine a child wanting to make the choice of having and spending a dollar now, rather than putting it in the bank to save for later. Distracting the children from the immediate desires of the money, therefore, such as helping them to think about something else like going to play in the park or partaking in a craft the child enjoys, might help them overcome the urge to make an impulse

decision. Additionally, one might focus the child's attention on the particular look of the bill and challenge the child to collect one of each of a one dollar bill, five dollar bill and ten dollar bill so that they can see the different pictures on each. Thus, giving children more and more varied experiences with this type of interaction surrounding choices could help them to develop their self-control at a faster rate.

Research has also shown that if children are involved in the process and understand the choices they have (i.e. allowed to make a choice about incentives received post- delay of gratification), delay is easier (Hom & Fabes, 1984). For older kids, 4th and 5th graders, delaying gratification was affected by past successes or failures in doing so *if* the past cases were steeped in something stable like ability or task difficulty. Delay of gratification was not affected by past successes or failures when those cases were based on unstable conditions such as luck (LeSure, 1978). In thinking about knowledge of personal finance, this research suggests that children might make and understand decisions better if they are understood as having stable conditions. For example, if a child has been successful in delaying the gratification of having $1 right now by putting it in the bank to gain interest, the child might be more apt to do that in the future if they know the success of making more money was based on their ability to make that decision, not a random happenstance at the bank.

Taken together, strategies like these that help children to reorganize the way they are thinking about a situation are reflective of the active role of metacognition in making choices. Simply put, metacognition means thinking about thinking. Development of one's metacognition involves learning to pay attention to strategies being used to reach a goal when solving a problem. In the case of making choices, the studies above show that children can be taught to not only pay attention to the current strategies they use to make a choice (i.e. whether to delay gratification), but furthermore to modify those strategies in order to reach a more positive outcome. In essence, children are developing more sophisticated theories about what it means to make a good choice, even if that might involve putting off an acknowledged reward.

Brain Development/Executive Function. As has been established, making choices often involves an ability to delay gratification. Delaying gratification is an example of an application of inhibitory control which is housed within executive function. While most people can have trouble controlling inhibitions from time to time, this is particularly difficult for children around 3 or 4 years of age (Zelazo et. al., 2003). This phenomenon manifests itself by an inability in these children to perseverate on simple sorting tasks. In other words, when sorting rules change, young children often lack the ability to inhibit the effect of an initial rule in order to apply a second.

For example, Zelazo et. al. examined 3- and 4-year-olds' inhibitory control ability on a simple and commonly used card sort task. Participants were given a set of cards each with one item pictured on it. Items varied on two main dimensions. For example,

children might have seen either red or blue objects and either animals or toys, such that there could be a blue cat, a red cat, a blue ball and a red ball. Participants were first asked to sort cards according to one dimension, like color. Once children sorted all the cards into a red and blue pile, the cards were collected and then the experimenter explained that the rule had changed. This time, the child was asked to sort the cards according to the second dimension, animals and toys. The study found that children fail to switch to sorting by the new rule. Furthermore, similar studies (Carlson & Moses, 2001; Perner et. al. 1999) showed that children continue to make this error even when they can tell the experimenter the new sorting rule.

There are two theories as to why this happens. One theory posits that children of this age are unable to hold that much information in their memories at one time. However, a second theory suggests that the problem is not one of memory capacity, rather of attention. On this view, children merely lack the physical ability to inhibit paying attention to the former rule. While the exact mechanism explaining why this happens is still up for debate, both theories agree that inhibitory control is key in dealing with situations that may involve multiple rules.

Young children will need to keep multiple rules in mind when making decisions about finances. Choices they make could be dependent upon different kinds of rewards offered at different times depending on the situation at hand. If one rule or consideration, for example that it is better to save money for later, is consistently given to the child, they may have trouble making the decision to spend money in a future situation even if the reasons in favor of doing so are clearly explained to the child. Again, it may be better to draw the child's attention to *why* they think the way they do in order for them to focus on multiple aspects of the choice they need to make.

Summary. Making choices in the financial world often involves looking to the future. Young children can have a very difficult time both in the concept of the future, as we have also seen in previous sections, and also in delaying gratification. Thus, we might expect a child to desire the immediate benefits of money now instead of potentially greater benefits that come from putting money in the bank. The key here, however, seems to lie in helping children learn to exercise conscious control over their own decisions and not just automatically choosing the most immediate or attractive option. In teaching about making financial choices, programs could de-emphasize the salient, desirable features of the immediate money, effectively taking the child's mind off of the impulse of immediate gratification. They could also denote future dates pertinent to financial decisions as special occasions, thus increasing the likelihood that younger children will understand how far away that future event is.

Social Values: Given that financial domains were created to navigate within and across societies, it only makes sense that some basic social values will need to be understood to successfully learn about personal finances and economics. Beyond the values of

exchange and markets, discussed earlier, other domains such as gifts/charity, generosity, public goods/service and a sense of community play particularly big roles here. Many of these concepts can be understood when discussing larger issues, such as children's understanding of issues like equality/inequality, particularly as they apply to economic status. Much of this research's focus begins at the end of the age group on which this paper focuses. Younger ages will be discussed when information is available.

Piaget. The Piagetian theory of cognitive development could easily account for the fact that there is little discussion of young children's understanding of economic inequality. In fact, poor cognitive reasoning of children younger than 7 years of age is cited in one study that asked children and adolescents about such inequality. Leahy (1981) asked 6-, 11-, 14- and 17-year-olds to describe rich people, poor people and to talk about how the two social groups are similar and different. Answers were categorized into two large groups of answers. Answers could be peripheral, meaning that they focus on external elements of the environment, such as material possessions or central, meaning that answers focus on internal qualities of a person, such as psychological descriptions or thought processes. A majority of the answers provided by 6-year-olds fell into the former category, with a marked decrease in these answers with age. Even by 11 years of age, children had significantly increased central descriptions, while decreasing peripheral descriptions.

Theory Theory/Core Knowledge. Alternatively, children's descriptions of inequalities, or their understanding of social values, could be explained by their particular experiences in the world. There is a whole developmental paradigm that touts the importance of one's social atmosphere to the developmental trajectory of the individual. Emler, Ohana and Dickinson (1990) claim that while the Piagetian framework is very often used to describe conceptual development, what it ignores is the inevitable contribution of social transmission. Conceptual development within the economics and personal finance field lends itself particularly well to this view. The specific economic organization of the child's immediate and larger environment can have a significant impact on their level of economic understanding.

According to Claar (1995), children as young as 3 years of age, base their knowledge of these values on a set of a few experiences that become prototypical for the child. A child may conceive of an automatic teller machine as a money-making machine because their experience is that they (or their parents) require money, they approach the machine, they tell the machine they require money and in response, the machine produces that money (Claar, 1995). There is little understanding of how this necessity is related to social roles or social values. As children, age, however, they have more experiences in this realm, thus more opportunities to hone their understanding. Children will likely eventually experience a time when they themselves, or a parent, might not be able to get money whenever they want it, or may not be able to afford a particular item. Furthermore, they may have an experience in which they cannot afford an item, but another individual can.

These experiences can provide an excellent forum in which to reason about equality or inequality in the economic world and perhaps even fairness or justness.

These additional experiences can be situated in many different types of settings within a child's environment. Thus, the understanding they carry away may depend on which environments are working at the time. In fact, the understanding children come away with may even depend on whether or not multiple environments are working at the same time and whether or not they concur or provide competing explanations. For example, children may have some or all of the following environments working on their understanding of the situation: cultural context of greater society, social institutions like religions or political settings, familial contexts and the specific experience granted to the individual. A child may have a difficult time coming to a sophisticated understanding of why some people can afford an expensive item, but others cannot if their societal and religious explanations differ. Some religious contexts have a whole system of social justice with which perhaps a family or their political affiliations might disagree.

As further evidence that experiences likely allow children to reason about more complex issues, such as fairness, justice and equity, Emler and Dickinson (1985) asked children to reason about pay discriminations. Even children at 7 years of age tend to judge discriminations in pay in terms of equity – that is, if there is more work to do, or work is more demanding, then it is just/fair that the employee to be compensated at a higher rate. Furthermore, middle class children seemed to have this view more strongly than working-class children. This may be due to availability of information (or lack thereof) about social economics in each class system.

Faigenbaum (2005) has specifically looked at young children's understanding of and behavior surrounding gifting practices within the context of exchange. According to this study, there are two types of exchanges that are relevant here. The first is that of associative reciprocity, in other words, Person A gives something to Person B because Person B gave Person A something in the past or because Person A might want something from Person B in the future. Conversely, Person A might *not* give something to Person B because Person B did *not* give something to Person A in the past. The second type of exchange involved is strict reciprocity, or the idea that one is trying to get a good deal or considering the value of exchange. Person A might be willing to exchange an object for something of a similar or greater value belonging to Person B, but not for something of lesser value. Value may be determined along a number of dimensions, such that the comparison may not be strictly monetary. An exchange item may have lesser monetary value, but greater sentimental value, for example.

Many young children, preschool or younger, operate largely under associative reciprocity, where most forms of gifting are categorized. In addition to the likelihood that exchange value is difficult for such young minds, Faigenbaum also suggests that there is a social bond created by giving gifts that young children find particularly

compelling or comforting. As an example, several young children (kindergarten?) who have just returned from buying candy at a store attempt to negotiate an exchange. One girl wishes to exchange a particular type of candy with another child and suggests a trade that the second child deems unfair (not equal). After a series of negotiations, the second child suggests an exchange that is more in his favor. The girl who initiated the exchange accepts the offer, indicating that she cared more for the act of giving than for a just exchange. From kindergarten to 1st or 2nd grade, however, there is a marked shift from a majority of associative reciprocity exchanges to a minority.

Conclusions

This review of the developmental literature uncovered many descriptive studies of children's thinking about financial and economic issues. Researchers have asked what children know about money, about banks, about income inequality, etc. The challenge revealed by this review is organizing this descriptive work according to a theory of cognitive development and/or a set of principles of financial literacy. Our hope is that this review provides at least a starting point for these two theoretical projects.

The bulk of the extant literature directly considering financial issues has been carried out within a Piagetian framework. This theory provided a clear model of the course of development and a basis for distinguishing developmentally appropriate financial literacy. Young children operate at a level of appearances; they focus on a single salient feature, and have very little appreciation of cause-effect relations. As cognitive capacities are subject to general constraints, financial education should be focused on topics within these capacities. That is, introduction of more complex concepts must wait for developmental transitions. Thus prescriptions for financial education for young children focus on providing them experience with concrete phenomena (e.g., distinguishing denominations of coins by size and color). The appropriate starting point for financial education is a few independent concrete features and instruction/development moves to the multiple interacting abstract features.

Unfortunately for those wishing to develop instructional programs based on cognitive-developmental theories, the clear framework laid out by Piaget has not fared well under empirical investigation. As the literature reviewed from the perspective of core knowledge indicates, young children are capable of complex, interactive, and abstract thinking. Moreover, children's knowledge about one aspect of finance is not, necessarily, predictable from their understanding of some other aspect. For example, young children seem to have a relatively sophisticated understanding of exchange. They appreciate the conditional structure of deals and trades. At least by the early elementary-school years children know something about the relations between supply and demand in determining people's willingness to make certain kinds of exchanges. At the same time, young children are often ignorant about the nature of banks, profit, and income-inequality. The explanation for this profile of cognitive capacities relies on domain specific concepts and

experiences. In general, young children will have a richer understanding of things that have been important features of our species' evolutionary history, and that have been important features of their experience. For example, children grow up in social environments where resources are distributed on both contingent and non-contingent bases. This raises problems of sharing, reciprocity, and enforcement of agreements that have been central for our development as a species. In contrast, children have little interaction with banks, credit, and salaries, and these are also very recent features of our species' economic environment.

Although the core knowledge approach differs in many respects from the Piagetian, there are many commonalities. Just as Piaget believed that education that did not connect to existing cognitive structures would have little impact, core knowledge theorists hold that education is most effective when it relates to existing theories or models. Children may learn isolated facts, but they will retain and use things that "make sense" with respect to their current understanding. Both Piaget and core knowledge emphasize that children are active learners; information they receive is filtered and accommodated to fit with current beliefs. While Piaget held that it was possible to identify general qualities of children's thinking that could guide expectations about learning in specific domain, the core knowledge approach takes the existence of particular cognitive structures or constraints as an empirical question to be discovered in each particular domain. From the current review of the literature on financial literacy, we suggest two sets of "core" structure or qualities of young children's thinking that both constrain and advance thinking.

Exchange & Value: The first core element is an understanding of exchange and value. Children engage in transactions involving exchanges of resources from a very early age. Especially in the first year of so of life most of those transactions have an unconditional character (e.g., parents giving child food), but during the toddler and preschool years children also engage in conditional transfers (e.g., parents giving child reward). Indeed if the notion of resource is broadened to include social interaction (e.g., positive attention) then the reciprocal interactions between caretaker and infant, involving turn-taking and coordinated activity, are very early economic exchanges.

As the review of the literature illustrated, there has been a limited amount of research on children's conceptions of exchange. Most attention has focused on children's understanding of the conditional structure of exchanges as a quasi-logical problem. Fiske's work on grammars of social organization represent the clearest steps toward an account of cognitive models of economic activity involving exchange and value. Although there is very little developmental work on Fiske's models, he does argue that the model involving market pricing, which seems most "financial", is late-emerging. Efforts to develop financial literacy in young children could focus on the movement from Fiske's three more "basic" models, Communal Sharing, Authority Ranking, and, Equality Matching, to an understanding of Market Pricing.

We suspect that the critical feature of development of Market Pricing is the segregation or distinction of financial considerations from other elements of exchange. For example, a financial exchange is not a matter of being nice, friendly, respectful, or even fair: A financial exchange is a matter of price and market. Of course niceness and fairness are also involved in financial transactions, but financial literacy involves being able to recognize and reason about these factors independently. Research in our own lab on children's understanding of ownership illustrates just this kind of segregation problem (Kim & Kalish, 2007). Our research, and the existing literature, suggests that young children may not clearly distinguish property rights from other sorts of attachments to property or elements of social interactions. Adult intuitions clearly distinguish between ways of distributing property that are the nicest, most effective, and fairest, and ways of distributing property that are actually consistent with property rights. I may have lots of marbles and you none. There are all sorts of reasons I might give you some, but those reasons are not the same as you actually own some of the marbles. Young children tend to conflate those considerations. Increasing sophistication in the domains of ownership and finance (which are likely linked) may involve refining pre-existing models of exchange and value to focus on only some aspects of these complex phenomena. This may be a challenge for children because in experience financial considerations are not divorced from social and emotional ones.

Executive Function: The second core cognitive competency in financial literacy is planning and executive function. Here there are important brain mechanisms, but also an important role for experience. The development of executive function is recognized as one of the core areas central to children's successful functioning and development (see Riggs, et al., 2006). For example, school readiness and school success is linked to executive function in preschool. Given this recognized importance there are many research programs devoted to assessing and improving executive function in early childhood (see Meltzer, 2007). Efforts to improve executive function around financial decisions can draw on this body of work. It remains to be seen, however, whether development of executive function is a unitary skill or is more domain specific. Does ability to delay gratification in the context of doing homework translate into ability to delay immediate purchases in favor of savings?

One of the special challenges in improving executive functioning in preschoolers is that we may be asking children to do things they are not designed to do. From an evolutionary/cultural-comparative perspective, the planning and future-orientation demanded of young children in modern society is unprecedented. Western schooling is an un-natural institution. Young children are acting as independent economic agents in modern Western societies in ways they never have before. The uniqueness of this situation carries no moral or normative implications; to think otherwise is to commit the naturalist fallacy. However, such unnaturalness may carry some psychological implications. The first is that it may be difficult to teach children these skills. The theory is that we are designed to speak, but not to read. Learning to speak is relatively effortless;

but learning to read requires an especially supportive environment. A second implication is that there may be substantial individual differences in executive function. Because there was not strong selection pressure for early executive function we can expect variability in the population. A third, and somewhat more controversial suggestion is that acquiring skills like executive function may not be fun. David Geary (1990) has argued children are built to enjoy the acquisition of some skills (e.g., language, basic numeracy, social cognition); exercise and mastery of the skill is intrinsically rewarding. Other skills (e.g., advanced math, reading) are not intrinsically rewarding and may require a fair amount of social coercion for advanced development. In working to increase children's planning and executive function educators should be sensitive to the fact that the demands of adult, modern society may not be a good match with children's natural development.

Our hope is that this review will support financial literacy programs that are based on these developmental issues and that are sensitive to the lack of fit between core/intuitive ideas and the demands of modern society. This review of the psychological literature provides some basis for identifying basic elements of financial literacy and for designing programs to improve financial education. However, what young children do know, and what is relatively more or less difficult for them to understand, are only parts of the problem in designing financial literacy education. The other piece is an analysis of the goal-state; what would we like them to know or be able to do? The aims of financial literacy education must come from an analysis of the financial environments children live in, and of the capacities we hope to see in adults, as the results of development and education. Psychological research can inform strategies for developing these capacities, in terms of ordering and means of introduction. However, why we might want to teach some aspect of financial literacy, is it important that children know or be able to do something, is not, strictly, a psychological question. That something is difficult for young children to understand does not tell us whether this is something we should work on, or whether this is something best left alone.

Section 3.1

Program Assessment and Evaluation: U.S. Programs

Understanding the effectiveness of financial literacy programs is important to individuals and society. Making poor financial decisions is a private problem in that individuals suffer loss of income and wealth. The poor financial decisions of individuals is also a public problem as evidenced by the current financial crisis attributable in part to unsustainable housing purchases and by persistent concerns about the consequence of low savings by individuals for long-term economic prosperity of the U.S. Low levels of

financial knowledge among individuals is a growing national concern, raising the question of what "works" to raise knowledge.

The President's Advisory Council on Financial Literacy included among their list of "**Important questions we wish we knew the answers to (research topics)"**

> 1. What is one action that we can take (education, policy, business practice) that will bring about the most behavioral change?
>
> 2. What factors successfully predict financial behavior change?
>
> 3. What is the impact of financial education on financial behavior? How do we measure the effectiveness (impact) of financial education? Does education matter?
>
> 4. At what age and in what way we can effectively engage people with financial literacy?
>
> 5. What roles do personal values play in explaining financial behavior?
>
> 6. Does financial education mitigate a person's value system?
>
> 7. What are the key features of an effective financial education program?
>
> 8. What are the key characteristics of an effective delivery system for financial education?[3]

These are program evaluation questions—asking the question of what are the desired outcomes of financial education programs, how those can be measured, and whether those expected outcomes can be causally attributed to participation in a program.

Program evaluation is a causal analysis which asks whether outcomes observed are different from what would have been observed for those same individuals if there had been no program. Very often program participation may be correlated with desired changes, but may not have been due to the program. In financial education there is considerable evidence that financial knowledge is correlated with low-income, but the causal direction is not established. Individuals may acquire financial knowledge in the process of acquiring wealth or the motivation for economic success may be the common cause of acquiring wealth and acquiring the knowledge that is tested in financial literacy surveys.

The challenge of program evaluation is assessing what would have happened to individuals without the program—in the case of financial literacy programs, would

[3] From http://www.ustreas.gov/offices/domestic-finance/financial-institution/fin-education/council/3rd-meeting-2008/ResearchCommitteeAppendixA.pdf

individuals have learned something or as much anyway? One cannot observe participants with and without the program under exactly the same circumstances *but* for the program, and so a comparison group ("counterfactual") must be defined which did not participate in the program, but from whose comparative experience one can infer the consequences of program participation.

Evaluating the influence of financial literacy programs for young children faces the usual evaluation design challenges as well as additional ones due to young ages of participants. When financial literacy programs are voluntary and parents and teachers determine children's access to a particular curriculum, highly motivated parents and teachers or those with particularly precocious children and students may be those who seek out these learning opportunities. While these children may be measured as more financially knowledgeable at the completion of the educational program, those gains would be attributable to the "selection" into the program by motivated parents/teachers who otherwise would have taught their children those same lessons.. This selection effect is a major issue in any evaluation designs. For example, unemployed individuals who are already actively searching for jobs are more likely to see job training opportunities and more healthy individuals are likely to seek higher education and be in better paying jobs. The correlation between job training and employment and between education and employment is not causal, but each due to a third factor causing both. This selection effect is also an issue in evaluating the relative effectiveness of different programs; each may be offered to or appeal to different groups of individuals because of how variations in program duration and delivery methods fit into the rest of their lives.

Evaluating programs for young children presents additional challenges. Financial literacy programs have almost universally been evaluated through survey of financial knowledge. How does one examine the increase in knowledge for young readers and writers? Though teachers and parents may be asked to assess student programs, subjective assessments of particular students may be biased by their own knowledge, what they learned in the process, their own expectations of students and external pressures to effective educators.

Table 3.1 presents basic information on programs aimed at young children. The first conclusion to be drawn is the fairly large number of programs focused on young children. The grid was developed to summarize key differences: method of delivery, availability (free access, versus proprietary for sale), age focus, delivery method (teachers, parents), and whether an evaluation has been undertaken. A web site is provided, if available.

Virtually no rigorous evaluations exist for the studies included in this grid. The program "evaluations" are primarily "one-shot case studies," or pretest-postest (single-group) design. The first can be described as:

> Neither an evaluation nor an assessment, because there is not comparison, either between groups or over time. It is merely a description. (Langvein and Felbinger, 2006, p. 107).

The second is considered the weakest evaluation design, with maturation being a major threat to statistical interpretation, and with statistical analysis being "under-identified." That is, there is no clear identification of program effects. An example is the presentation of the effects of "Money on the Bookshelf," used by Nevada Cooperative Extension in parent-child workshops. A survey was given to parents before and after the program and it was found that " parents showed statistically significant gains in how often they:

1. Talked with their children about things that relate to money,
2. Included their children in talks about how family money is used, and
3. Used everyday events as opportunities to talk with their children about money" (Behal et al. 2003).

The most likely validity issue is that the change over time may be due to maturation—children and parent's communication about money changes over time as children become more curious about monetary exchanges. It may also be due to a "testing" effect as parents are more familiar the second time with surveys and the questions asked.

The absence of a comparison group is also a problem for interpreting the evaluations of the Money Savvy Generations Program. [4] The several schools and age groups that have participated have been surveyed at the beginning and after completing the program. Students were asked opinion questions about money management issues with answers on a Likert-type scale. Again, maturation and testing effects could explain a large share of the increase in "correct" answers.

Suggested evidence of learning is listed at the EcEd Website (program 9 and 14-16). These are indicators of knowledge of material taught, without any indication of gains in knowledge.[5] This is more the monitoring of progress that is described as possible by other programs such as Moneyopolis (item 21).

Item 28 is included, a program for High School Teachers, because it represents probably the most serious attempt at program evaluation, yet remains at best a pre-post test design for a small group of students, with most providing feedback on course content and instructors only in a post-test. A post-course knowledge test was given to one group of students which was compared to nationwide scores on the same test. This comparison raises serious selection effect issues.

[4] See the URL for several evaluations at http://www.msgen.com/assembled/research.html
[5] See http://ecedweb.unomaha.edu/elelearn.cfm

Section 3.2

Financial Literacy Programs: International Programs

Introduction

This section reviews financial education programs for young children developed outside the United States. That financial literacy is of growing concern world-wide is indicated by the number of initiatives that have been developed by international, national and private agencies and institutions in other countries. Even so, there is only a small number of studies that systematically review the types and extent of the financial education initiatives that are taking place in different parts of the world. We first describe several large-scale surveys of programs across several nations. We describe findings and conclusions of relevance to preschool education. We next compare , examining whether these rereviews of programs and then present The present overview, that by no means is exhaustive, centers on financial literacy programs that are being delivered worldwide, but excluding the US, and are directed to youngsters, with especial emphasis in ages below six.

Cross-country Surveys of Financial Education Programs:

In 2003, the OECD launched the Financial Education Project, which had two major goals: first, to assess the extent of the need for financial education and second, to develop principles for improving financial education and literacy standards. In 2005, the OECD published the report "Improving Financial Literacy Analysis of Issues and Policies," which it labeled as "the first major study of financial education at the international level (p.10)." (OECD, 2005). This publication focused on non-school based programs, those serving the general population including programs targeted on investment, savings and financial education; credit and debt awareness; and on unbanked adults and teens. Recognizing that "it is important to educate individuals as early as possible about financial issues," the OECD project expects to describe and analyze financial education programs available at educational institutions including those for younger children. A report on these school-based programs is not yet available.

The definition of financial education provided in the report implies there are important underlying concepts that must be grasped in order to understand the specifics of financial issues and financial decisions. That definition is:

> the process by which financial consumers/investors improve their understanding of financial products and concepts and, through information, instruction and/or objective advice, develop the *skills and confidence* to become more aware of financial risks and opportunities, to make informed choices, to know where to go for help, and to take other effective actions to improve their financial well-being.

> Where:
> ● information involves providing consumers with facts, data, and specific knowledge to make them aware of financial opportunities, choices, and consequences;
>
> ● instruction involves ensuring that individuals *acquire the skills and ability to understand financial terms and concepts,* through the provision of training and guidance; and
>
> ● advice involves providing consumers with counsel about generic financial issues and products so that they can make the best use of the financial information and instruction they have received. (emphasis added).

However, a reading of the report finds little discussion of the underlying concepts required to understand the basics of financial products and of risk and return. The highlighted surveys in older teens and adults in four countries (Korea, Japan, U.S., and UK) focused on the identification of particular savings and investment vehicles, ability to develop a budget, awareness of the impact on personal finances of education, savings and debt choices, and the components of a personal risk management plan
An important conclusion of the report is that:

> Financial education programmes should focus on high priority issues, which, depending on national circumstances, may include important aspects of financial life planning such as basic savings, private debt management or insurance as well as *pre-requisites for financial awareness* such as elementary financial mathematics and economics

In 2008 the European Commission established a "formal commission on financial education," the purpose of which is to

1. share and promote best practice on financial education;
2. advise the Commission on how the principles for the provision of high-quality financial education schemes, contained in the Commission communication *FinancialEducation,* are being implemented;
3. assist the Commission in identifying any legal, regulatory, administrative and other obstacles to the provision of financial education;
4. advise the Commission on how the obstacles identified should be addressed;
5. contribute to preparation of the various initiatives presented in the communication on financial education, and to an evaluation of those initiatives planned for 2010.

The year prior to the establishment of this group, the EC contracted for a survey of financial literacy initiatives in European Union member countries. The consequent report

published in 2007 appears to be the most comprehensive study of national financial literacy programs in both its extensive coverage and comparison of literacy programs and its description of program characteristics (Habschick, 2007). Based on responses to over 800 questionnaires sent out using a "networking" survey methodology, the contractors identified 154 of what they called "core" financial literacy schemes, with the majority of those initiatives in UK, Germany, Austria, Netherlands and France. These "core schemes" were defined as those that taught skills including:

- numeracy, literacy and information skills in the context of financial literacy;
- how to assess, interpret, question and evaluate finances;
- how to understand the nature and use of money;
- the consequences of financial decisions,
- the rights and responsibilities of customers, and
- how to weigh risks and benefits.

The published report describes the main sources of variation among the schemes and presents 10 case studies. None of these case studies focus on very young children. The youngest target group is an Austrian program for three age groups ranging from age 10 to 18. While the curriculum is described as designed to "meet the demands of the specific age groups," there is no discussion in this report of how appropriate curricula were developed. The curriculum for the youngest group (10-12) discusses needs and consumption, important underlying financial concepts, but other topics are specific to particular financial activities including mobile phones, cash cards, car, debt and credit. The evaluation of this program follows a not unusual practice of assessing student opinions at the end of the course and teachers' assessment of students increased knowledge. The report authors write that:

> As for the impact of the workshops on the financial capability and knowledge of the pupils, it is difficult to comment due to the limited time frame of the evaluation. However, it can be seen that *especially younger children were sensitised to money issues such as commercials and the relationship between the price and the quality of goods*.
> (p. 29). [emphasis added]

It is interesting to note, that one-quarter of the 154 "core schemes" target low-income or low-educated families and one case study is of a program in Poland that targets poor or near-poor families and youth. We mention this particular targeting because few programs for children appear to consider the different financial challenges and more limited financial opportunities faced by low-income children and their parents. The EU-commissioned report describes the Polish program as allowing for the:

> particular life situations of the poor as they often have precarious livelihood strategies, scarce resources and limited access to financial services. Given an

> increasing number of complex microfinance products and services available to the poor, including credit for housing and education, money transfers, insurance and saving-accounts, poor clients encounter difficulties to assess their options and use them to their advantage. (p. 31).

Based on the results of both the OECD and EC commissioned reports the EC proposed a set of principles to aid authorities and different institutions in their effort to launch and run financial education programs (EC, n.d.). The set of principles presented in this report, follow a general discussion of the need for improved financial education programs some targeted to the general public and others to specific population groups. This concluding report does mention children, though only briefly arguing that "Financial education can help children to understand the value of money and teach them about budgeting and saving." One of the proposed principles is:

> Principle 3: Consumers should be educated in economic and financial matters as early as possible, beginning at school. National authorities should give consideration to making financial education a compulsory part of the school education curriculum.

Fluch (2007) examined the type and extent of the financial literacy programs provided by thirty central banks. The author found that only one third of these banks claim to consider primary school children as a target group. These are the central banks of the following countries: Austria, Canada, Switzerland, the European Union, Japan, the Netherlands, New Zealand, Poland, the United Kingdom, and the United States. In general, the aim of the programs for primary school children is, according to Fluch, to familiarize them with "basic, easy to understand money concepts in an entertaining fashion." The author points out that the commitment of central banks to their educational activities is quite dissimilar, ranging from only having "money museums" to broader educational programs. Fluch also states that, except for the Bank of England and the Federal Reserve System, little is available for primary school children although other central banks have begun to provide special materials and tools for this target group. In general, educational materials are focused on money management. However, the author points out that some central banks use wording and content that is too technical and suggests delegating to external experts the design and communication of their educational products (including print products, visitors or educational centers and e-educational modules).

The Australian Securities and Investments Commission (ASIC, 2003) examined financial literacy education in Australian secondary schools, drawing comparisons with financial literacy education in schools in the UK, US and New Zealand. The purpose was to understand the status of financial education in secondary schools and to develop proposals for incorporating financial education into the regular curriculum. The focus is

on older school children, but this report stands out from other reviews in explicitly proposing a set of underlying skills necessary for the comprehension of the financial concepts that are explicitly taught in most personal finance courses and in arguing that personal financial decision making is part of "life skills" development. Thus, the report argues that financial literacy should be incorporated into the curricula across schools subjects and age groups. The list of underlying skills is not unlike the concepts we listed earlier in this report. The definition of financial literacy given in the ASIC report is:

> the ability to make informed judgments and to take effective decisions regarding the use and management of money. This definition places emphasis on the *skills and areas of knowledge* that are likely to be necessary to make informed judgments.

The listed key skills and knowledge are:

1. Mathematical literacy and standard literacy
    - essential mathematical, reading and comprehension skills.
2. Financial understanding
    - an understanding of what money is and how it is exchanged; and
    - an understanding of where money comes from and goes.
3. Financial competence
    - understanding the main features of basic financial services;
    - understanding financial records and appreciating the importance of reading and retaining them;
    - attitudes to spending money and saving; and
    - an awareness of the risks associated with some financial products and an appreciation of the relationship between risk and return.
4. Financial responsibility
    - the ability to make appropriate personal life choices about financial issues;
    - understanding consumer rights and responsibilities; and
    - the ability and confidence to access assistance when things go wrong.

Program Comparison

We looked for programs that are currently being offered in other countries than the U.S.. We based the search first, on the European Commission's report. Among the schemes and initiatives listed in that report, we selected those that were described as directed towards children and had a website that could be visited. The second source of information was the International Gateway for Financial Education (IGFE) website[6]. The

[6] http://www.oecd.org/pages/0,3417,en_39665975_39666038_1_1_1_1_1,00.html

IGFE is a program developed by the OECD to facilitate international cooperation on financial education. A third source of information was Australia's "Understanding Money" website.[7] The Understanding Money campaign was established in 2005 by the Australian Government; originally managed by the Financial Literacy Foundation it has since 2008 been managed by the Australian Securities and Investments Commission (ASIC). [8] We also review the programs listed in the ASIC discussion paper reviewed above. Finally, we also gathered information on financial education programs by conducting a search directly on the Internet. In all cases, we verified whether the products are still on-line and if so which kind of information is provided on the program or service being offered.

Table 3.2 shows basic information on forty-five of the financial literacy programs and initiatives that we found. The age range of the target group, young people, is four to twenty. Because the Financial Literacy Foundation allows all providers of financial literacy education programs that fulfill the Foundation's requirements to be listed in their website, almost 50 percent of the programs listed are from Australia. Only half of all the programs listed in Table 3.2 are directed to children attending primary school and only a few of them make direct reference to the kindergarten or younger level.

In general, we identify six main groups of programs:

1. Those designed for integrating economic and financial education into the school curricula. For example, the UK National Curriculum mandates the inclusion of financial literacy elements as part of its learning goals. The "Financial Capability through Personal Financial Education," developed by the UK Department of Education and Employment, offers guidance to teachers in order to facilitate them to include in their lessons the financial capability elements mandated by the National Curriculum.

2. Programs developed by autonomous government founded entities or by independent organizations assisted by governments' agencies. We include in this group programs that are linked to existing school curricula. To these types of programs belong the New Zealand's "Sorted" program and the Australian program "MakingCents."

3. Programs developed by private organizations offering financial training for children and parents. An example of this sort of program is the "Financial Literacy Training" program offered originally in Hong Kong.

[7] http://www.understandingmoney.gov.au/

[8] The Foundation established quality standards that the educational materials had to meet to be listed on its website. See: Financial Literacy Foundation (n.d).

4. Programs offering instructional materials for parents, teachers, or children. Usually the material can be found on-line and may have different formats, from pamphlets to games. We can find examples of this last type of material, in the form of comics, in the "Financial Education Initiative" of the Reserve Bank of India.

For only a few programs could we find explicit information on program content. Thus it was difficult to discover what specific concepts were taught and what pre-requisite skills were assumed. An assessment of the theoretical underpinnings of programs requires more information than that obtainable through reviews of web-sites. From the programs listed in Table 3-2-I we selected three that offered sufficient information from which we could ascertain the basic concepts among those listed in Table 2.1 that the programs covered.[9] These were:

- Nationwide Education: Financial Capability (UK);
- Sorted (New Zealand); and
- Financial Literacy Training (Hong Kong), and
- Credit Union National Association's "Thrive by Five" (US).

Table 3-2-II lists concepts and marks which of the programs addresses them. What is striking is the lack of uniformity in basic concepts taught in these few programs targeted to the same age group. All teach about savings (or deferred spending), wants versus needs, that there exist alternatives among which choices must be made, and that savings for future consumption is a positive behavior. Three discuss elementary record keeping and budgeting, future consumption, teach some money management, methods of decision making, and the value of gifts. The widely taught UK program teaches basic numerical relationships and introduces elementary economic concepts such as prices, debt, fees and borrowing. There is more conformity between the UK and CUNA program with the New Zealand and Hong Kong program diverging from each other in the weight given to lessons in, for example, money and income versus the process of making choices.

The point is to indicate the wide variation, even among four quite well-developed programs, in the material covered. The strength of this variation is the potential to discover what type of program is most effective in increasing financial literacy. The weakness is the evident variation in what are considered key elements of financial literacy among young children. This variation makes it difficult to measure financial literacy—children will know different things depending on where they received that education.

[9] This is not intended as an exhaustive list of the programs for which this is possible or a statement that other programs have not specified the concepts they emphasize. Programs may have more information available in other form than on web sites.

Conclusion: Programs vary greatly in content, target audience, and delivery methods. There are a large number of financial education programs targeted on young elementary students, with a minority targeted for very young children. These generally involve parental input. We did not find evidence of programs designed specifically for children in pre-school programs. No programs have been rigorously evaluated. Evidence of program effectiveness comes from programs designed for readers and writers, those already in school.

The President's Advisory Council on Financial Education recommends that effort should be made to:

> **Identify and promote a standardized set of skills and behaviors that a financial education program should teach an individual.[10]**

Our review of current programs found little evidence of consistency in the skills taught and very little evidence of explicit linking of program-taught skills to theories of cognitive development. On the other hand, lessons in some programs may in fact reflect common wisdom about child-development and be appropriately designed. This is a question that could be explored at the next stage of the project.

Given the variety of financial literacy programs, it is necessary to examine which approaches may be most effective in both increasing knowledge of very young children about basic financial concepts and examining whether that knowledge improves their financial decisions in later years—as older children and adults. We believe this it is possible to construct a well designed evaluation to obtain that evidence.

[10] http://www.treas.gov/offices/domestic-finance/financial-institution/fin-education/council/PACFL-recommendations.pdf

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Table 1.1

Financial Literacy Concepts

1. Numbers: The concept of number, or having a number sense, is important to personal finance literacy in the following domains:

    - More/less
    - Production/consumption
    - Patterns/measurement
    - Data analysis

2. Time: An understanding of personal finance requires an accurate representation of time, not clock time (seconds, minutes, hours). But the relation of past, present, and future. This concept of time is important in the following domains:

    - Thinking about the future
    - Saving – defer spending
    - Investing
    - Building assets
    - Time value of money

3. Money and income: The first, in terms of bills and coins, is an almost universally taught component of early childhood financial education. Other concepts are important to understanding the role of "money" and income in facilitating financial transactions. These specific concepts include.

    - Bills and coins (value and use of)
    - Functions of Money
    - As store of value
    - Other forms of "money"
    - Sources of money and income
    - Earning income

4. Markets and Exchange: Exchange of goods and services and the abstract "market' within which those exchanges occur are key concepts in personal finance literacy and involve social interactions among individuals within a larger community. Some of the specific concepts involved in this domain are:
    a. Markets
        - Prices
        - Demand
        - Supply

- Competition
- Equilibrium Price
- Shortages and Surpluses
- Profits and losses
- Meaning of Goods and Services
- Resources – Human and Natural Capital

b. Exchange
- Debt
- Barter
- Borrowing and Credit
- Trusting
- Cost of borrowing
- Fees/interest rates
- Spending
- Managing Money
- Consumption matching income
- Property ownership and transfer of ownership
- Trade
- Profit
- Taxes
- Specialization

5. Institutions: While some "market" exchanges can occur without formal institutional structures, financial decisions largely involve some interaction with institutions whose effectiveness depends on trust as well as formal regulations of professional practices. How children understand the larger world beyond home and parents is particularly relevant when considering children's concepts of personal finance. In additional to financial institutions such as banks, it is important to introduce children to other institutions and their roles in facilitating exchange.

   - Entrepreneurs
   - Insurance
   - Financial institutions
   - Roles/jobs of family members

6. Choice : The seeming orientation of consumers towards current consumption rather than saving for the future is one motivation for the growing interest in financial literacy education. Most early financial education programs include this as an an educational component, though not all do. Section 2 on cognitive development spends the bulk of the review on the development of skills involving choice and decision-making. Choice involves managing information about:

- Scarcity
- Opportunity cost over time
- Perceived present and future necessity
- Delayed gratification
- Thrift
- Budgeting
- Financial risk

7. Social Values: Financial relationships manage how individuals within a society interact in order to obtain desired goods and services. Given that financial institutions and regulations enable individuals to negotiate these exchanges effectively and efficiently, it only makes sense that some basic social values must be understood and shared for these institutions and regulations to "work." The list below reflects underlying social values.

    - Gifts
    - Generosity
    - Public goods
    - Sense of community

8. Habitual behavior: We include this in one of assessment exercises since this is increasingly seen as a component of financial behavior, the hypothesis being that not all wise financial decisions are made with careful deliberation but out of habit (monthly savings, avoidance of scams). There is growing interest in instilling good habits as well as good reasoning.

    - Savings as positive
    - Shopping as negative

Table 3.3 Concepts included in selected programs

		Selected International Programs		
		I	II	III
	CUNA	Nationwide Education: Financial Capability[1] (UK)	Sorted[2] (New Zealand)	Financial Literacy Training[3] (Hong Kong)
Concepts	Ages			
		4-7	5-7	5-6
1. **Numbers**				
More/less	x	x		
Production/consumption				
Patterns/measurement				
Data analysis				
*Record keeping	x	x	x	
*Balance			x	
2. **Time**				
Thinking about the future	x	x	x	
Saving – defer spending	x	x	x	x
Investing				
Building assets				
Time value of money				
3. Money and income				
Bills and coins (value and use)	x	x		x
*Currency		x		x
Functions of Money				
As store of value	x	x		
*As medium of exchange	x	x		
*Purchasing value	x	x		
*Pocket money (allowance)	x	x		
Other forms of "money"	x	x		x
Sources of money and income	x	x		
Earning income	x	x		x
Credit		x		
*Financial record		x		
*Inflation		x		
*Safe storage	x	x		
*Losses/Unexpected losses		x		x
4a. Markets				
Prices	x	x		
Demand				
Supply				
Competition				
Equilibrium Price				

Shortages and Surpluses				
Goods and Services				
Human/Natural/ Capital				
4b. Exchange				
Debt		x		
Barter	x			
Borrowing and Credit - Bargaining		x		
Cost of borrowing				
Trust				
Fees/interest rates		x		
Spending	x	x	x	x
Managing Money	x	x	x	
Consumption matching income	x		x	
Property ownership and transfer of ownership				
Trade	x			
Taxes	x	x		
Specialization				
*Closing balance			x	
*Expenses		x	x	x
5. Institutions				
Entrepreneurs				
Insurance		x		
Financial institutions				
*Bank		x		
*Bank accounts (saving, checking, credit card)	x	x		x
Roles/jobs of family members				
6. **Choice**				
Scarcity				
Opportunity cost over time				
Decision making. “Self-regulating” behavior	x	x	x	
Delayed gratification	x	x		
Degree of perceived necessity				
*Wants vs needs	x	x	x	x
Thrift				x
Budgeting	x	x	x	
Financial risk				
*Risk management			x	
*Financial plan		x	x	
Trade-offs	x		x	
*Selecting a bank in terms of best interest rates and/or lowest fees.		x		

*Decisions at the margin				
*Alternatives	x	x	x	x
7. **Social Value**				
Gifts	x	x	x	
Generosity	x			x
Public goods	x			
Sense of community	x			
8. Habitual behaviors				
Reinforced behaviors	x			
Savings as positive	x	x	x	x
Shopping as negative				
10.Specific instruments/behavior discussed (list as appropriate)				
Saving instruments				
Mortgages		x		

References

[1] Source available at: http://www.pfeg.org/curriculum_and_policy/england/primary/primary_outcomes.html#coin_recognition

[2] Source available at: http://www.sorted.org.nz/life-stages/kids-and-money/for-teachers/about-the-games

[3] Source available at: http://www.aandbmake3.com/images/children_curriculum.pdf

Note: * indicates specific course content that is more specific than the general category concept, but may be included with the same conceptual intent.