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**The Emotions and Cognitions Behind Financial Decisions: The Implications of Theory for
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Abstract

Financial decisions are compelled and constrained by non-financial factors. These include personality characteristics of individuals as well as the social environments in which decisions are made. This paper provides an overview of theories that seek to explain how non-financial factors influence financial decisions: Developmental Psychology, Crystallized and Fluid Intelligence, Behavioral Economics, Neuro-Brain Research, and Culture of Poverty. Our interest is in what these theories imply about the behavior of vulnerable, particularly low-income groups. The literature reviewed indicates the importance of emotions and feelings in decision making; these must be considered in developing and evaluating financial literacy education programs.

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Financial education material and approaches are often developed by practitioners based on the strong assumption that, if individuals are presented with knowledge and financial tools, then they will better be able to assess the relative advantages of known financial options and choose what is most likely to achieve their financial goals. Critics contend that this rational behavioral model asks too much of individuals in that they must be ‘a supernatural being possessing demonic powers of reason, boundless knowledge, and all of eternity with which to make decisions. Such visions of rationality often contradict with reality’ (Todd and Gigerenzer 2000: 727). This criticism fails to appreciate the flexibility that is allowed in economic models for information and time constraints and for the variation in preferences that individuals bring to decision making. However, it explicitly acknowledges the role of emotions, family upbringing, genetics, peers, and social context in shaping not just what but how options are valued and financial decisions are made (Braunstein and Welch 2002).

In this paper, we review key theories that provide insight into the personal and social determinants of financial decision making. Psychologists have long grappled with individuals’ attitudes towards and behavior involving money and consumption and so the first part of this paper reviews developmental psychology theories. The paper next discusses three areas in which the measurement of cognitions has significantly advanced our understanding of individuals’ thought processes: the measurement of intelligences, behavioral economics, and neuro-brain research. A long history in measuring intelligence has recently led to discussing how different types of intelligences are used when making financial decisions. We discuss this emerging area of financial-literacy research. Behavioral economics can be described as the explicit merging of psychology and economics, drawing on insights from psychology to explain behavioral variations. These variations may seem irrational within traditional economic models but could be

judged rational given the psychological constraints that shape assessments of risks and rewards. Because the ability to map the brain's response to financial-related stimuli promises to add insight into how decisions are made; we briefly describe this area of research. The persistence of poverty rates among some demographic groups have led to the assertion that economic status, akin to cultures defined by lineage or geographic area, is associated with shared values and practices that shape the decision making process. We, therefore, examine this culture of poverty hypothesis. Finally, we offer an overview of the dominant theories in each of the areas of investigation, focusing on the implications of these theoretical approaches to understanding the financial decisions of 'vulnerable' groups, particularly of the low-income population. In the last section of the paper we discuss implications drawn from these theoretical approaches for understanding how factors, other than those that may be labeled as strict rationality, shape how financial knowledge is used.

The literature reviewed in this paper complements the research reviewed in another Center for Financial Security-Financial Literacy Research Consortium paper (Way 2010). That paper also reviews the literature on human development and relates it specifically to educational interventions at various stages of life. Although the explicit intent of that review is to recommend technology-based interventions, it also suggests optimal strategies and formats for financial education. Given the potential overlap in the reviews of these two papers, this paper focuses specifically on the psychological components of financial decisions and the implications for financial education interventions.

Developmental Psychology

Developmental psychology theories seek to understand how individuals' personalities and behaviors develop over their lifespan. Although these theories acknowledge the importance

of genetics, they primarily focus on mental processes, emotions, personal relationships, and social context. We describe major foundational theories, including psychoanalysis, psychosocial, learning theory, and cognitive psychology.

Psychoanalysis Theory. Psychoanalysis theory, its origins credited to Sigmund Freud, argues that the unconscious has power over human behavior and emotions, including behaviors associated with money transactions. Indeed, important insights from psychoanalysis derive from their observations about individuals' conflicting attitudes towards money.

Following psychoanalysis theory, individuals are assumed to be pleasure seekers who face an unconscious conflict between instinctual urges and the barriers, including social norms, to acting on those urges (Goldhaber 2000). This conflict is described by three mental constructs: the id, the super-ego, and the ego. The id seeks to increase pleasure and follow unconscious desires, while the super-ego works to follow social norms in order for the individual to live up to his/her ideal image. Psychoanalysis argues that individuals' attitudes towards money were shaped by the conflict between the id and the super-ego, between the inherent desire for more of it and the social norms that may be violated in the pursuit of money (Krueger 1986). The mediating role of the ego determines individuals' personality characteristics, including levels of fiscal responsibility, that are acquired before puberty and persist into adulthood (Goldhaber 2000).

Personality traits, according to psychoanalysis, develop from the resolution of pleasure-seeking conflicts at distinct life stages.¹ Through developmental stages, with particular influence at the anal stage, individuals develop their subconscious and conscious views of money. In the anal stage (ages one to three), the child learns about self-control through toilet training (Berger 2006). What happens during this stage, especially the approach of the parents towards toilet

training, influences whether a person is anal retentive (i.e. stubborn, stingy and orderly) or anal expulsive (i.e. exhibits lack of self-control, generous, over-spender) about financial as well as other matters. These traits persist into adulthood (Fuqua 1986).

While today little credence is given to their theoretical underpinnings, psychoanalysts observe that money was more than a means of exchange but also had unconscious associations with other qualities, such as ‘fear and security,’ ‘acceptance and rejection,’ and ‘power and impotence’ (Krueger 1986: 3). It is the observed ‘paradox’ of money, between desiring more money and the unconscious shame related to money, that is a topic of many psychoanalytical writings (O’Neil 1993). Fenichel (1945) argued that the fear of becoming poor led to anal retentive personality traits in adults. Turkel (1988) contended that how a married couple arranges their finances reflects power, dependency, revenge, and anger within the couple unit. Rangell (1969) repeated Freud’s belief that individuals will accept advice when making small financial decisions but will rely on their feelings when making large decisions. Vohs, Mead, and Goode (2006) identified the conflict that results between the desire to increase one’s wealth and the social norms about money-related behaviors. Krueger (1986) described specific money phobias.ⁱⁱ Trachtman (1999) posited that there were psychological consequences arising from how an individual defines enough, too much, or not enough money. O’Neil (1993) argues that financial success comes at that cost of potential isolation, self-destruction, and narcissism. In more recent work, two psychoanalysts, Tuckett and Taffler (2008), recognized an emotional sequence to stock market bubbles that, they argued, was fueled in part by the conflict individuals faced between the pleasure and risk of investing.

Criticisms and Contributions. The primary criticism against psychoanalysis was that its hypothesized causal relationship between observable outcomes (e.g., stinginess) and

unobservable inherent characteristics was untestable (Webster 1995: 9). Because psychoanalysis developed from observing a small subsection of people (i.e. European men and women), at a particular moment in time (i.e. end of the nineteenth century), many critics argue that the theory reinforces societal and cultural expectations of that day, including the role of male dominance (Friedan 1997; Irigaray 1997; J. Ryan 1995). Finally, most of the psychoanalysis literature deals with issues of wealth accumulation with little attention paid to the poor (Fuqua 1986).

However, as a major developmental theory that has persisted for nearly a century, the limitations of psychoanalysis are countered by the insights it provides. These insights include the lasting effect of childhood experiences on both the conscious and unconscious mind, and psychoanalysis emphasis on the role of subjective feelings in human behavior. Unacknowledged feelings and thoughts cause individuals to act in seemingly irrational ways, even when equipped with the knowledge and skills to make a different decision. Psychoanalysis also drew attention to the effect early life experiences have on financial behaviors and attitudes throughout life.

Psychosocial Theory. First proposed by Erik Erikson, a psychoanalyst by training, psychosocial theory redefines the stages through which personality develop and explicitly considers the impact of social, cultural, and historical forces on behavior (Elkind 1970). Psychosocial's eight stages are defined by the dominant conflicts that occur during each period of development: trust vs. mistrust, autonomy vs. shame, initiative vs. guilt, industry vs. inferiority, identity vs. role confusion, intimacy vs. isolation, generativity vs. self-absorption, and integrity vs. despair. (Berger 2006). Similar to psychoanalysis, psychosocial theorists argue that personality is developed from the resolution of conflicts, especially in early life stages. Maturation and social experiences cause each psychosocial conflicts to occur in a specific order, regardless of the outcomes at prior stages (Crain 1992). As a result, if a negative identity is

formed at one stage, the individual will be at a disadvantage in subsequent developmental stages (Crain 1992; Goldhaber 2000).

Before the age of five, children are expected to go through two of the psychosocial developmental stages that have implications for their adult life. In the first stage, trust develops between the infant and caregiving adults. This trust carries over into adulthood (Erikson 1980). If mistrust develops, then the individual will be withdrawn; too much trust will lead to a false sense of security (Erikson 1980). Ideally, a healthy sense of trust will create adults who are not addicted, self-delusional, or greedy (Elkind 1970; Erikson 1980). In the second stage, parent and community support enables the child to become self-sufficient and develop a ‘sense of self-control without loss of self-esteem’ (Elkind 1970; Erikson 1980: 70). If the environment is too rigid or pushy, then the child will feel shame, be self-conscious, and doubt his/her abilities (Elkind 1970; Erikson 1980). For both stages, the relationship developed between child and caregiving adults continues into the relationship between the adult and larger social institutions. The individual who finds social organizations, including financial institutions, too controlling and complicated may not participate because he/she mistrusts them or fears losing autonomy, free will, or initiative (Erikson 1980).

Two subsequent stages are completed during the elementary school years. During the third stage, ‘the child must now find out *what kind* of person he is going to be’ based on the examples provided by parents and other adults (Erikson 1980: 78). A child who develops initiative is able to be “‘more himself,” more loving and relaxed, and bright in his judgment’ (Erikson 1980: 78). Fear, caused by limits set by influential adults (e.g. parents, teachers), may discourage initiative (Elkind 1970). As adults, those children who developed a sense of initiative are more likely to engage in the economic system (Erikson 1980). During the fourth stage, the

child develops a sense of industry, defined as ‘being able to make things and make them well,’ working diligently to completion, and ‘winning recognition by producing things’ (Erikson 1980:90-91). As adults, those who develop this sense of industry are confident in their ability to learn and use new skills.

During the fifth stage, adolescents become who they are by merging all the different aspects of themselves (e.g. athlete, student, brother, boyfriend, and son) into one identity (Elkind 1970). An adolescent who does not develop a strong sense of identity, is thought to more likely to find comfort in a negative identity (e.g. find identify in gangs or drugs) or lose their distinctiveness through clique membership (Elkind 1970; Erikson 1980). Erikson spent much of his thinking about this stage because psychosocial theory argues that that these teenagers become adults who either avoid or engage in the broader society (Elkind 1970). During adulthood, people encounter the last three stages of conflicts. Those who are successful in the sixth conflict—intimacy vs. isolation—develop both intimacy and productivity (Erikson 1980). Isolated individuals will separate themselves from others, while intimate individuals will find companionship in friends and marriage partners (Berger 2006). Middle age is characterized by the generativity vs. self-absorption conflict. Generativity means that individuals contribute, either through procreation or other altruistic behaviors, to society as a whole and value the success of future generations (Elkind 1970; Erikson 1980). The opposite causes adults to be self-absorbed in their own personal desires and comforts (Elkind 1970; Erikson 1980). In the final stage, integrity vs. despair, a person either accepts and is satisfied by their life or not (Erikson 1980). Those who despair fear death, are not satisfied, and do not accept their life circumstances because they wish for what could or should have been (Elkind 1970; Erikson 1980).

Although early psychosocial theorists hypothesized that the personality traits of trust, autonomy, and initiative are set in early childhood, more recent psychosocial theorists have argued that personality traits, including those important to financial decisions and behaviors, change throughout adulthood (Gould 1972; Whitbourne et al. 2009). Norman, McCluskey-Fawcett, and Ashcraft (2002) describe how older women revisited trust and identity as they became more vulnerable to physical limitations, loss of relationships (.e.g. widowhood), and role changes. Metcalfe and Mischel (1999) argue that will power and self-regulation increases with age. Other research finds that success or failure at early childhood stages affects coping skills and resiliency in adolescents and adults (Webley and Nyhus 2008).ⁱⁱⁱ

Criticisms and Contributions. Psychosocial theory is criticized for the difficulty in testing an hypothesis about the patterns of life course development that lead to different personality traits across individuals (Elkind 1970). While noting the ‘recurrent difficulty in pinning down just what [Erikson] means,’ one critic also wrote that the ‘effort to encompass all of human experience’ may be too ambitious and, consequently, may not be useful (Wurgaft 1976: 211). Others disagreed with the identification of the specific stages.

Nevertheless, psychosocial theory has made some important contributions to how we now view developmental psychology. First, Erikson challenged Freud’s focus on erogenous zones and pleasure seeking, which dominated psychology at that time. Psychosocial theory argues that conflicts impact development, affecting how one relates to institutions, society, others, and oneself for the rest of one’s life. Negative identity formed in an earlier stage affects the successful development in subsequent stages. Second, psychosocial theory is culturally relevant, recognizing the social context that influences behaviors and decisions. Third, by

including stages of development beyond that of adolescence, psychosocial theory recognizes the full life cycle and conflicts faced by adults.

Learning Theory (Behaviorism). Many behavioral psychologists dismiss psychoanalysis and psychosocial theories because of the focus on unobservable urges and conflicts whose presence and influence are not testable (Watson 1913). Learning theory (also termed behaviorism) offered a methodical study of the observable influences of behavior and how people acquire habits (Goldhaber 2000). Pavlov, a founding behaviorist, documented that behavior can be learned, modified, and extinguished by altering the conditions (including immediate stimuli) in which the behavior occurs (Pavlov 1960).

Learning theory evolved most notably with the work of Skinner. Skinner determined that once the behavior is associated with a consequence, whether a reinforcer or punishment, the likelihood of the action continuing changes. For example, a rat that receives food after pulling a lever will continue to pull the lever, but a rat that receives a shock will not (Crain 1992). Skinner argued that positive reinforcement and punishment are not equal, with the former providing longer lasting results and the latter having negative side effects (Skinner 1953). Skinner argued that a punishment should include positive reinforcements so individuals receive a signal about how to behave as well as how not to (Crain 1992).

Skinner studied two types of behavioral reinforcers: primary and secondary. Primary reinforcers are biologically programmed into humans, such as food, pain, or odors, and cause innate responses (Delgado et al. 2006; Skinner 1969). For Skinner, money is a powerful secondary reinforcer, because it is associated with the ability to purchase primary reinforcers (e.g. food) and has a socially-negotiated value (Delgado et al. 2006; Skinner 1953, 1969). Therefore, money can promote behavior, such as working, because it enables a higher standard

of living (Skinner 1969). On the other hand, loss of money has been found to be equally effective as a shock in deterring behaviors (Delgado et al. 2006).

Skinner found that time mattered—that a lapse of even a few seconds affects the association between behavior and the consequence (Skinner 1954). For example, a person will continue to spend money instead of saving it because spending has the immediate reward of the purchase. This attention to time led Skinner, as well as Pavlov, to argue that, by breaking large tasks into separate skills that can be performed in sequence and reinforced, an individual will be better able to learn complex behaviors, such as paying down debt or investing in stock (Pavlov 1960; Skinner 1953, 1954).

Bandura added to Skinner's theory the importance of observable learning (Bandura 1969, 1977). Bandura's explicit recognition that individuals are also influenced by what they see others do was an important theoretical link between learning theory and cognitive psychology (Bandura 1969; Crain 1992).

Criticisms and Contributions. Critics of learning theory question the greater 'scientific' basis of behaviorism over psychosocial or psychoanalysis theory (Breger and McGaugh 1965; Wiest 1967). Others question the ability to explain complex human behaviors by only considering the observable and ignoring the important roles of cognitions and emotions (Breger and McGaugh 1965). Additionally, because behavioral experiments often take place in the laboratory, critics question learning theory's application to describing behavior that occurs in a social reality (Bandura 1977; Breger and McGaugh 1965).

Nevertheless, learning theory advanced investigations of human behavior by focusing attention on the observable, thus emphasizing the importance of testing behavior propositions. It acknowledges the power of prerequisite conditions and the anticipated consequences, whether

positive or negative, in influencing people's actions. Thus, in contrast to theories that emphasized the power of early development, learning theory emphasizes the possibility of life-long learning during which the stimulus for or the consequences of behaviors can be altered (Crain 1992; Goldhaber 2000). Finally, the greater effect of immediate positive reinforcement over punishment has application for all learning environments, including financial literacy education. Learning theory, intentionally or not, dominates many financial transactions. Undesirable financial behavior, such as over drafting a bank account, is typically punished by fees. Some programs reinforce good behaviors by offering quicker access to tax refunds with electronic filing and deposits or consumer points when credit cards are paid fully. It is these behaviors (e.g. paying bills on time, balancing a checkbook, and setting goals for financial future), absent consideration of the emotions or cognitions that may compel them, that are the target of financial literacy education efforts. .

Piaget's Cognitive Theory. Cognitive theory's interest is in the cognitive processes that lie between the observed cause and its effect on behavior. From observing the thinking and actions of children, Jean Piaget argued that what actually elicits a response is both the sensitization to the stimulus and how people think (Byrnes 2008; Piaget 1983).

Central to Piaget's theory is his view of how individuals gained knowledge, arguing that it occurred from interaction, first physically and then mentally, with objects.^{iv} He was convinced that, 'in order to know objects, the subject must act upon them, and therefore transform them: he must displace, connect, combine, take apart, and reassemble them' (Piaget 1983: 104). Cognitive theory also hypothesized developmental stages—of which there were four (Goldhaber 2000; Piaget 1983).^v Each stage is constructed by the individual and is achieved at his/her own pace. However, no stage can be skipped, resulting in some individuals never making it to the final

cognitive development stage (Crain 1992; Goldhaber 2000; Piaget 1983). It is in the third stage of development that the capacities, such as use of logic and ability to follow rules, are formed. These capacities are essential to making financially sound decisions. However, it is only in the last stage, which may never be achieved, that the individual develops the ability to think abstractly and manage hypothetical situations (Crain 1992). With the ability to plan ahead and think through all possibilities, these individuals are at a greater advantage when it comes to financial decision making.

Although maturation, experiences, and social environment contribute to human development, Piaget argued they are not sufficient (Piaget 1983). He proposed the concept of equilibration, or ‘a set of active reactions of the [person] to external disturbances’ that results in self-regulation to maintain cognitive harmony (Goldhaber 2000; Piaget 1983: 122). Anything that threatens this balance is a cause of disequilibrium, or a cognitive conflict (Goldhaber 2000). People organize their thinking by comparing and contrasting experiences, sequencing events, and inventing symbols to maintain equilibration (Goldhaber 2000). Memory, or the retrieval to information, plays an important part (Bruner 1988). The implication is that how one organizes his/her thinking about an early financial issue affects subsequent financial decisions and behaviors.

Piaget argued that people either assimilate or accommodate new information (Piaget 1983). Assimilation is the integration of new information into a cognitive structure created by the person. Accommodation is when knowledge is modified in order to make sense of the new information. Both assimilation and accommodation will change the child and cause him/her to adjust thinking, furthering cognitive development (Goldhaber 2000).

Criticisms and Contributions. The foremost implication of cognitive theory's hypotheses is the importance of a developmentally appropriate education. Because 'learning is subordinate to the subjects' level of development,' instructors, whether classroom teachers or financial literacy educators, must consider how to teach the material in a developmentally appropriate way (Piaget 1983: 114). Additionally, the timing of education is important. Because of their egocentric nature, children in the second stage of development are limited in their understanding of finances (Scheinholtz et al. 2010, forthcoming). They have simple reasoning skills and may not comprehend abstract concepts such as values or the future. Some aspects of financial education are more appropriate for the fourth stage of development when the ability to think abstractly develops (Scheinholtz et al. 2010, forthcoming). Furthermore, since the stages are sequential, it would be erroneous to assume that everyone at the same age is at the same stage in terms of development and abstract thinking. Even financial literacy curriculum for adults must consider a wide range of cognitive abilities.

Second, equilibration using assimilation and accommodation has implications for learning new skills and tools, including those related to financial security. For example, if people are able to assimilate or accommodate new information into already created mental structures, then the new information will be easier to mentally file and organize and may, by implication, be more likely used. If new information does not fit with prior knowledge, the individual may create accommodations between prior and new knowledge, leading to seemingly irrational choices. In other words, learning new concepts depends on 'the network of existing beliefs within which new concepts must fit' (Gelman and Kalish 2006: 690).

Piaget has been criticized, primarily, for the rigidity in his view of development and the potential inapplicability to broader populations. He believed that concepts, such as time and

numbers, could not be grasped easily by younger children. However, contemporary researchers argue that this is not necessarily true (Byrnes 2008; Gelman and Kalish 2006; Lourenço and Machado 1996). Piaget also observed only children from often well-educated, high-income families, raising questions about the broad applicability of cognitive theory and the theory's ability to explain, not just describe, human development (Byrnes 2008; Lourenço and Machado 1996). For some critics, the stages of development put growth in a negative light, are wrong in their proposed age ranges, or are not explained thoroughly enough (Byrnes 2008; Lourenço and Machado 1996; Meadows 1988). Additionally, the theory ignores post-adolescent development (Lourenço and Machado 1996). For other critics, Piaget did not say enough about feelings and emotions or the importance of social factors (Byrnes 2008; Lourenço and Machado 1996).

The Measurement of Cognition

The inability to test most theories or apply the tested theories outside the laboratory limited their applicability to guiding social interventions. However, their observations about the variability in individual's relationship to their environment (including financial relationships) and hypotheses about the patterns of human development over the life course were instrumental in advancing the notion that early life influences mattered, especially in determining the way in which individuals made later life decisions and related to external institutions. The measurement of these mental processes and of the effect of intervening factors is enabled by advances in three areas of inquiry, which we describe in turn.

The Measurement of Intelligence. The field of psychology has long grappled with measuring individual intelligence with early efforts primarily focused on measuring children's intelligence (Cattell 1943). However, when measuring adult intelligence, the tests proved to be biased, predictively weak, and inconsistent (Cattell 1943). Cattell argued that these problems

arose because intelligence was a complex construct and more conceived as a ‘multidimensional (structural) construct with different abilities showing different developmental functions’ (Baltes et al. 1980: 90). He hypothesized that single intelligence metrics measured several types of intelligence, each of which evidenced itself through different brain functions, whose development was due to different factors and which were differently influenced by age and life-experiences.

The theory of fluid-crystallized intelligence, as proposed by Horn and Cattell (1966), offered a measureable conceptualization of complex intelligence (Baltes et al. 1980: 90). Conceptualization of these two types of intelligence was consistent with much of the thinking among life-span development theorists. Life-span theorists understood development as being multidimensional, ‘involv[ing] a series of problems, challenges, or life-adjustment situations that come from biological development, social expectations, and personal actions’ (Baltes 1987: 614).

Cattell and Horn specified distinct subcomponents to intelligence, but two were the primary focus of their writing and research—fluid and crystallized intelligence. Fluid intelligence (Gf) is determined by life experiences that directly affect the structure of the brain, while crystallized intelligence (Gc) develops primarily from education and acculturation (Stankov 1978). Each has different life trajectories, with Gf peaking early and declining after late childhood and Gc remaining stable or increasing through adulthood (Baltes 1987).^{vi} Fluid intelligence can be thought of as determining an individual’s general reasoning ability that is directly related to inherent physical brain characteristics defined by heredity or subsequent injury. Crystallized intelligence represents the formal reasoning that is gained through education, experience, and acculturation. Analyses (using factor analysis methods) has shown that Gc is

associated with the skills considered to enhance financial literacy—numeracy, verbal comprehension, and the ability to incorporate into one’s reasoning environmental and cultural influences (Horn and Cattell 1967).

MacCann (2010) measured Emotional Intelligence (EI), a form of intelligence recognized by Cattell but thought to be dominated by Gf and Gc. EI is the ability to accurately perceive emotion, the ability to appropriately use emotion to aid problem solving, and the ability to purposively manage emotions. In tests of intelligence distinction, she found EI highly correlated with Gc but far less so with Gf, suggesting the EI is ‘likely to be learned through social modeling and experience, and may be subject to different motivational influences. Acculturated knowledge and emotional knowledge are certainly strongly related...’ (MacCann 2010: 495). If these findings are valid across populations, they imply that social context may be even more important to financial decisions than are inherent personality characteristics of individuals.

Cattell had ascribed an important role to personality in intelligence by hypothesizing that ‘fluid intelligence turns into crystalized intelligence by continuously being directed into specific areas of knowledge’ with personality playing a role in the probability of that occurring and the areas of knowledge explored (1963: 445). Zimprich (2009) tested that hypothesis and found that both Gf and Gc were correlated with personality, additional confirmation of the role of subjective factors in decision making.

The Measurement of Economic Behavior. The fields of economics and psychology developed on paths that sometimes crossed and then diverged. Adam Smith and David Hume both developed their economic theories with strong psychological components (Smith and Haakonssen 2002). As psychology increasingly explored unconscious behavioral determinants, economic theory turned to developing empirically testable rational choice models, paying

diminishing attention to psychological determinants of behavior (Camerer and Loewenstein 2004; Sent 2004). The rise of cognitive psychology, with its view of ‘the brain as an information processing device’ (Sent 2004: 748), inspired economists to reexamine the link between economic behavior and psychology as a means of understanding deviations from what might otherwise be identified as ‘rational outcomes.’ These ‘new behaviorist’ economists shared an intent to use the power of economic theory to increase ‘the power of economics by providing it with more realistic psychological foundations’ (Camerer and Loewenstein 2004).^{vii}

Behavioral economics begins with the observation that individuals in standard economic theory and individuals in real life are quite different (Mullainathan and Thaler 2000). Neoclassical theory assumes that individuals have unbounded rationality, unbounded will power, and unbounded self interest. In contrast, behavioral economics recognizes humans are bounded in all three areas.

Bounded Rationality. Unbounded rationality assumes that individuals are able to make the objectively most advantageous decision given full information and infinite amount of time. In reality, individuals’ decisions are bounded by cognition and environmental constraints (Gigerenzer 2001; Simon 1986; Tversky 1969). Bounded rationality recognizes the shortcomings in human cognition that lead to judgment biases (e.g., hindsight bias, overconfidence bias, self-serving bias) (Arkes 1991). These biases may result from the heuristics, or shortcuts, the human brain uses in order to process, store, and retrieve information to make decisions. Heuristics arise because of their availability and representativeness (Tversky and Kahneman 1974) and because they are fast and efficient decision-making aids (Gigerenzer 2001). Other decision-making shortcuts and effects that fall under this category include mental accounting (Thaler 1990), asymmetric risk-preferences (Antonides 2008), and endowment effects (Kahneman and Tversky

1979). As Gigerenzer and Simon argue, these heuristics help individuals function in an environment in which not all information can be processed. The use of these heuristics, biases, and shortcuts help describe the behavior of human beings and explain how errors in judgment (and economic outcomes) are committed (Gigerenzer 2001; Simon 1986).

Seemingly anomalous behavior in the face of similar risk has puzzled many—including financial literacy educators—in trying to understand individuals' decisions when choosing among mathematically equal probable outcomes (Camerer and Loewenstein 2004; Kahneman and Tversky 1979). Kahneman and Tversky, together and with others, have published extensively on the difference between objective and subjective assessment of probabilistic outcomes.^{viii} They found that individuals' subjective assessments of mathematically equivalent probabilities of outcomes with identical value (e.g. objectively evaluated in monetary terms) will be different depending on the subjective utility given to the probable gains and losses (Kahneman and Tversky 1979). This is because individuals appear in experimental studies to value losses more than the (objectively of equal value) gains foregone (Kahneman 2003). Subjective utility appears to have a time dimension, with risks over a one-day period discounted at a different rate (heuristic discounting) than even a few more days in the future (Laibson 1997). Experimental studies support that hypothesis that, utility assessment of likely outcomes are affected by life experiences, even when those life experiences have no effect on the actual probability of outcomes (Kahneman and Riis 2005). The implication of this body of research is that individuals' experiences matter in their assessment of choices. In other words, when individuals are asked what choices they would make between outcomes of equal probabilistic, these individuals bring their recent experiences and risk-preferences into that decision.

The importance of memory and time in risk-assessment suggests the challenges faced in convincing individuals to prepare for probable outcomes in the long-term:

‘The cultural norm of reasonable decision-making favors the long-term view over a concern with transient emotions. Indeed, the adoption of a broad perspective and a long-term view is an aspect of the meaning of rationality in everyday language. ...On the other hand, an exclusive concern with the long term may be prescriptively sterile, because the long term is not where life is lived. Utility cannot be divorced from emotion, and emotions are triggered by changes. A theory of choice that completely ignores feelings such as the pain of losses and the regret of mistakes is not only descriptively unrealistic, it also leads to prescriptions that do not maximize the utility of outcomes as they are actually experienced’ (Kahneman and Riis 2005: 1457)

Bounded Will Power. Neoclassical theory assumes that, even when individuals are faced with temptations and desires, they manage to optimize their consumption under constraints and resist those counter-productive urges. This assumption contrasts with the observations of psychologists, who find that humans are not necessarily able to resist inherent urges for pleasure. Consumption involves a complex interaction of unconscious and personal/social standards. Loewenstein (2000) outlined a framework of human will power that includes the visceral factors that both control human emotions and influence impatience in making economic decisions. Within this framework, he proposed various tactics that individuals could use to suppress undesired urges. These included desire-reduction tactics (Hoch and Loewenstein 1991) and the exercise of will power (Loewenstein 2000). Furthermore, he scrutinized the tactics of will power and the shortcomings in its exercise that cause individuals to make decisions against their own self interest (Hoch and Loewenstein 1991; Loewenstein 2000).

Bounded Self Interest. Jolls, Sunstein and Thaler (1998) noted that self interest, or the maximization of one's own gains, is limited by notions about the 'fairness' of outcomes for a group. . Deviations from preferred group outcomes may be considered 'unfair' by an individual even when that individual would gain from that deviation. Rabin (1993, 2002) noted the existence of bounded self interest in altruistic behavior. Some acts, typically labeled as altruistic can be incorporated into conventional utility models to the degree they increase the relative well being of individuals over time; providing for one's children increases the chances of one's survival, assisting others may increase one's sense of well-being, helping achieve broad social goals may benefit an individual or their family. To distinguish individuals whose actions may not lead to a net increase in their own utility, Rose-Ackerman proposed that the label of altruist be 'reserved for people who feel some moral obligation to help in the provision of charitable services and of jointly consumed goods not provided by the state' (Rose-Ackerman 1996: 773). Support for financial literacy education may involve both types of altruism--a sense that all should have equal access to information for their own benefit and the sense that individuals will gain when others make better financial decisions that affect the health of shared institutions and markets.

Measurements of the Brain. One can view all theories of developmental psychology and economic behavior as speculation on what happens inside the 'black box' of the brain. Neuroeconomics takes advantage of recent developments in medical technology to open this 'black box' by observing the physical nature thought and emotion. Skin-Conductance Response (SCR) assesses emotional arousal by measuring changes in electrical resistance of the skin. Electroencephalography (EEG) uses electrodes attached to the scalp to measure changes in electrical current created by brain activation and can detect changes within a millisecond

timeframe. Functional magnetic resonance imaging (fMRI) uses strong magnetic fields to create images of biological tissue by measuring the hemodynamic signals related to brain activity (Yu and Zhou 2007).^{ix} These tools allow investigators to examine whether, how, and in what sequence the areas of the brain known to involve emotion responds to stimuli and as decisions are made.

Three features of brain functioning make it likely that important new insights can be gained from explicit mapping of its functioning in response to external stimuli. First many physical actions occur through brain processes that take place without conscious awareness, but can be measured. Actions accomplished through habits are an example of this ‘automaticity.’ Thus while initial learning and understanding may be difficult, the brain can become sufficiently programmed to make certain responses more likely, easier, or even subconscious. This would lead the brain to respond to stimuli, sometimes with differently measured effects, as individuals use well accustomed shortcut rules (heuristics).

A second feature is that parts of the brain can be neuro-anatomically distinguished, meaning that similar processes are grouped together in the brain. This allows researchers to map where different processes occur as well as how different parts of the brain communicate in making complex decisions.

Finally, our brain appears to be driven to make sense of behavior with interpretations of what is sensed (including observed consciously) highly dependent on expectations or top down processes. For example, when subjects simultaneously hear music and see randomly flashing lights at the same time, they mistakenly report coordination in timing between the two. Similar mistaken beliefs about sport (or stock market?) streaks can be attributed to the brain’s drive to interpret observations consistent with expectations (Gilovich et al. 1985).

Emotions and Decision Making. Neuroscience has its origin and has continued to make contributions by observing behavior of patients with brain injuries compared to those without such injuries. Antonio Damasio (1994) observed that patients with damaged ventromedial prefrontal cortex (an area of the brain located above the eye sockets) repeatedly engaged in behavior that led to declines in both financial and social wellbeing, with no seeming tendency to learn from their actions. However, these patients performed quite normally when their intellect and problem-solving skills were tested. In fact their only limitations appeared to be their inability to understand and react to emotional situations and to learn from previous actions (Naqvi et al. 2006).

Damasio's observations led to conclusions about the consequence of damage to the ventromedial prefrontal cortex in patients' emotional state and, thus, to the role and importance of emotion in aiding decision making. His Somatic-marker hypothesis argues that emotions are important to guiding (and biasing) the decision-making process especially in cases of uncertain outcomes. He and colleagues (Bechara and Damasio 2005) tested this hypothesis using the Iowa Gambling Task and a SCR tests. In the Iowa Gambling Task subjects chose from four decks of cards with different risk-reward combinations. Two (advantageous) decks had low reward-loss outcomes with consistent choices from these decks leading to net gains. In contrast two disadvantageous decks had high reward-loss combination, leading to net losses with consistent choices from these decks. While normal participants initially sampled from both types of decks, high losses through sampling from the disadvantageous decks taught them to shift their choices to the advantageous decks. Normal participants also exhibited SCRs that were larger *before* choosing from the disadvantaged decks than before choosing from the advantageous decks. In contrast, patients with ventromedial prefrontal cortex damage did not show this anticipatory

emotional response, although their ex-post SCRs were differently responsive to the net outcomes (Bechara and Damasio 2005).

Similar comparative observations were made by Bechara and Damasio (2005) when comparing patients with a damaged amygdala, an area known to be involved with emotions. These patients as well failed to switch to greater sampling from the advantageous decks and did not exhibit anticipatory SCRs, but in contrast patients with ventromedial prefrontal cortex damage did not register SCR differences ex-post. Studies by these investigators imply that an area of the brain (the ventromedial prefrontal cortex) is important to registering, anticipating, and learning from the consequences of risky behavior, while the amygdala is key to registering that information initially. Thus, if the emotional response is not registered initially, then it cannot be used to anticipate (and evaluate) the riskiness of a task. There is now neurological evidence of what psychologists have been advocating for years— the importance of emotions and abstract thinking in decision making under uncertainty and risk. The ventromedial prefrontal cortex appears key in predicting future reward consequences of different behaviors, with the predictions also contingent on the brain’s ability to review information gained from specific reward consequences in the past.

Risk and Decision Making. Several studies have shown the brain to be differently activated when faced with choices associated with uncertain outcomes. The insular cortex, an area known to be involved in maintenance of the body’s internal environment, has been identified as an area important to assessing risk and guiding behavior based upon the anticipation of those consequences. Measured activity in the insular cortex is greater during high risk decisions than during low risk decisions (Paulus et al. 2003). The area is also differently activated when subjects evaluate the fairness of offers. Sanfey et al. (2003) had study subjects

participate in a game during which they could accept or reject a monetary offer. The money was offered with variations in the split between two subjects. While participants would be better off under any proposed division, low offers that were considered unfairly distributed had a significantly greater chance of rejection. Rejection was more likely when the deal proposer was a human opposed to a computer. The fMRI data show that unfair offers activated both the anterior insula, an area of the insular cortex associated with emotion, and dorsolateral refrontal cortices, areas of the brain associated with cognition, with activity in the former significantly increased when the respondent rejected unfair offers. This supports behavioral economists' arguments (described below) that the sense of fairness matters in decision making, with the additional information that these may be partially automatic rather than merely conscious rational thinking.

Gehring and Willoughby (2002) studied neuronal response in subjects performing monetary gambling task, where participant's choices were followed by a stimuli that informs them about the gains and losses. The study (using EEG measures) found that an outcome valuation signal was generated in medial-frontal brain regions but was greater in amplitude when a subject's choice resulted in a loss than when it resulted in a gain. Moreover, choices made after losses were associated with stronger loss-related brain activity than choices made after gains. Those results suggest that neuronal processes in medial-frontal brain areas may relate to mental processes involved in economic decisions. Gehring and Willoughby's observations imply that individual choices depend on the context in which a choice occurs – here not just to the expected outcomes of each offered choice, but to the prior sequence of gains and losses (Braeutigam 2005).

Khoshnevisan et al. (2008) asked individuals to evaluate three different levels of risk. Monitoring brain activity with an fMRI scan, they found greater activity in the Nucleus

Accumbens (NAcc) of the ventral striatum preceded both risky choices and risk-seeking mistakes, while the anterior insula activation preceded both riskless and risk-averse choice (Khoshnevisan et al. 2008). This finding is similar to other studies that find different regions of the brain activated in gain calculations and probability calculations (Knutson et al. 2001), and in loss calculations (Paulus et al. 2003). Arana et al. (2003) document an interesting activation in the amygdala when individuals are presented with a choice from among several items. Their study of subjects choosing items off a menu suggests that the lateral orbito frontal regions suppress responses to alternative desirable items in order to select the most desirable items (Braeutigam 2005).

Culture of Poverty

Acculturation is gaining greater attention as a factor in intelligence and behavior. According to sociology and anthropology, culture is generally viewed as the passing on of non-genetic traits, such as values, attitudes, and behaviors, from one generation to the next. The persistence of high-poverty rates among some social and demographic groups has extended the concept of culture to shared socioeconomic status. Oscar Lewis (1961) first used a ‘culture of poverty’ to refer to ‘both an adaptation and a reaction of the poor to their marginal position in a class-stratified, highly individuated, capitalistic society’(Lewis 1966: xlv). Poverty resulted in distinct behavioral ‘defense mechanisms without which the poor could hardly carry on’(Lewis 1961: xxiv). These characteristics, at a societal, community, family, and individual level, are self-perpetuating and passed from one generation to the next.^x

However, many scholars have taken issue with the theory of the culture of poverty from the very beginning. Valentine (1968, 1971) asserted that the self-perpetuating culture of poverty is mistaken and proposed that the lives of the poor are primarily influenced by social structures

and forces outside their control.(Valentine 1968, 1971).^{xi} Roach and Gurslin (1967) postulated that culture of poverty may describes a way of life instead of, as Lewis asserts, causing a way of life..^{xii} William Ryan (1976) argued that the culture of poverty blames the victim,' charging the internal, family, and community characteristics as the cause of poverty when in fact it is the history of racism and injustice that are the culprits. Coward, Feagin, and Williams' (1974) empirical study found no evidence to support most of Lewis' assertion of the generational attributes of poverty. (For a review of criticisms, see Gorski 2008).

Nevertheless, the culture of poverty theory remains implicit in some discussions about distinctions between the abilities, attributes, and behavior of the nonpoor and poor, including that related to household finance. Must programs consider broad cultural differences in addressing issues faced by low-income individuals, or can programs focus on ways to address the individual's financial circumstances and behavior? We review current work on this controversial sociological theory for its insight into financial literacy education targeted to low-income individuals and communities. Lewis (1998) categorized the culture of poverty's traits into: 1) the attitudes, values, and character structure of the individual, 2) the nature of the family, 3) the nature of the community, and 4) the relationship between the culture and the larger society. We use this framework to discuss current research pertinent to understanding financial decisions and behavior.

The Individual. The culture of poverty promotes the idea that poor individuals have different values and attitudes than those in middle- and upper-income households. These differences result from emotional and psychological adaptations to *persistent* economic and social subordination, giving rise to the continuation of these poverty-specific characteristics (Vaisey 2010; Wilson 2009). Others see the poor exhibiting the same variation in values and

attitudes as do nonpoor individuals but that the constraints, both financially and psychologically, under which poor individuals live lead to a different distribution of behaviors with more serious consequences (Bertrand et al. 2004; Mullainathan and Shafir 2009)

The research on specific values cannot firmly reject either claim. For example, it is often asserted that low-income groups have higher discount rates which contribute to their long-term income status (Hausman 1979) but this higher discounting is not consistently found to be the case (Houston 1983). Instead of differences in time preferences, this greater present orientation may arise from the uncertainty the poor face.^{xiii} Venkatesh found low-income women were, realistically, ‘pessimistic about the long-term stability of their households’ (2006: 53). Often these women were forced to take on large short-term risks in order to meet the immediate needs of the family. For example, financial assistance to other households, even when risking their own financial goals, ensures help when, inevitably, they themselves would need it (Venkatesh 2006). Setting and achieving long-term goals, such as retirement security or education, were limited by individuals’ lack of understanding and experience with and access to community resources (Venkatesh 2006).

Similarly, employment patterns are often argued to reflect cultural value differences across groups. However, Young (2010) found that low-income men have job expectations that were not different from other groups, rather that prior negative experiences led them to estimate lower probabilities of achieving long-term job security and income gains.^{xiv}

The Family. Some use culture to explain the current reality of families in poverty.^{xv} Because low-income couples encounter persistent challenges with ‘economic and housing situations, the division of child care and household responsibilities, and the personal problems with one or both of the partners,’ low income women develop different views of marriage

(Waller 2010) and of potential male partners (Burton et al. 2009). Others argue that these differences are better explained by the economic structure faced by poor women (Ooms et al. 2004; Teitler et al. 2009).^{xvi} Edin (2000) argued that, like higher income women, marriage attitudes among low-income women arise from the relative economic benefits of marriage. ‘If they cannot enjoy economic stability and gain upward mobility from marriage, they see little reason to risk the loss of control and other costs they fear marriage might exact from them’ (Edin 2000: 130).^{xvii}

The Community. Neighborhoods are thought to affect life chances of its’ members through ‘the quality of public schooling, proximity to economic opportunities and employment networks, and the degree of exposure to violence and to unhealthy environments’ (Sharkey 2008: 934). While poor education and job opportunities, rather than culture, causes geographic immobility among poor individuals, a culture of poverty perspective would argue that it is in the impoverished neighborhoods where disadvantage is structurally perpetuated and, therefore, culturally inherited.^{xviii}

If neighborhood characteristics have strong and long-lasting negative effects on cognitive ability, personality, decision making, and behavior education (e.g. Gc development) may be less effective in reversing generational poverty. Sampson et al. found that ‘exposure to concentrated disadvantage in Chicago had detrimental and long-lasting consequences for black children’s cognitive ability, rivaling in magnitude the effects of missing one year of schooling’ (2008: 852). This is consistent with findings by Hart et al. (2008). They provided evidence that children living in low-income neighborhoods lost resiliency, which is associated with academic achievement and prosocial development. Additionally, people who lived in impoverished neighborhoods reported lower self-efficacy (Boardman and Robert 2000). Brooks-Gunn et al. (1993) determined

that living outside of a concentrated poverty area had positive effects on IQ, behavior problems, teenage pregnancy, and educational attainment.

Persistently poor communities are not isolated from mainstream culture. Carter (2005) found that most minority students believe in the value of education, but their success in school is tied to how they believe they fit into the mainstream culture and school environment. Harding (2007) argued that adolescents living in disadvantaged neighborhoods are in fact exposed to a wider-range of behaviors, values, and attitudes than are middle-class adolescents. He wrote, ‘when there are multiple models, the advantages and disadvantages of various options are more poorly defined. The social environment provides a much weaker signal about what option is best because there is social support from others for many different options’ (Harding 2007: 349). The conclusion is that the greater is the diversity of views about the outcomes of a particular decision the more difficult is the decision-making process and the weaker is the commitment to the decision. This is not unlike theories of decision making that propose heuristics and shortcuts must be made when information is complex (Gigerenzer 2001; Simon 1986).

Nevertheless, impoverished communities are typically characterized by limited access to and interaction with more mainstream education and financial institutions, leading to different forms of family and community financial transactions and attitudes about personal financial responsibility. Lack of access to financial institutions and unstable income earned through the underground economy largely eliminates this group from the home or educational loan markets (Shipler 2004). With limited access to bank loans, businesses and individuals rely on each other for help when money is tight or turn to high cost alternatives, which are considered a ‘necessary evil’ (Venkatesh 2006: 6). As a result, the number of low-income Americans that are unbanked is triple that of the average (FDIC 2009). Many of the poor understand that banks do not

welcome persistently low-balance account holders, discouraging them with minimum balance requirements and overdraft fees.

Venkatesh's interviews with business owners illustrated the relationship many felt with banks. 'You get tired, tired of fighting them banks, the white-run creditors. Somethings you just feel better when you're with your own. So, I guess most of us would like to have more available sources of cash, but some of us have been fighting for thirty years! I mean at some point you just take your loss.... we have to do it ourselves' (Venkatesh 2006: 143-144). Lacking savings and a credit history, business owners believe they must rely on the networks of friends, family, businesses, creditors, and underground workings. This view is often reinforced by those who try to make it outside the neighborhood and return unsuccessful with 'tales of discrimination, bankruptcy, and exclusion' (Venkatesh 2006: 149). These community values, different from those in nonpoor neighborhoods, are argued to arise through the adaptation to the conditions inhabitants face, conditions resulting from the absence of services including financial and employment. Whether generational poverty transforms these values into 'culture' is a question for other fields perhaps than economics and financial literacy. What is important is that poverty is more than an economic status. It is associated with feedback from the community that may be important to the effectiveness of financial education offers.

Bringing it all Together: Development, Intelligence, and Economic Vulnerability

Different theoretical frameworks have emerged as providing potential explanations of how emotions and cognition may influence financial decisions. Psychoanalysis, which theorists applied directly to financial behaviors, see early life experiences and subconscious feelings as important factors in personality development and, ultimately, decision making. Like psychoanalysis, psychosocial theory looks to personality as the explanation of decision making.

However, this theory expands personality development to include both contextual factors, such as family and culture, and experiences over the life-course. . Behaviorists ignore internal factors in decision making, focusing only on behavior in a situational context and as a consequence of conditioning through reinforcement or punishment. Followers of Piaget focus on cognitive development to explain how people organize their thinking around decisions. Most will agree that the decisions of the economically vulnerable are influenced by factors within a particular context of disadvantage. However, the role of a self-perpetuating ‘culture’ to explain decisions of the poor is still debated.

Drawing on elements from these theoretical frameworks, others have emphasized the measureable influences on decision making. By implication, the factors that developmental psychologist and culture of poverty theorists assert affects decision-making would fit into the understanding of a multidimensional intelligence, including both fluid and crystallized. These factors influence intelligence and affects individual’s ability to assess options and manage behavior. For behavioral economists, decisions are a result of constrained rational choice and the influence of cognitions, including values and preferences. Finally, our growing ability to look directly at the brain as decisions are made allows us to see differences among individuals and among decisions in the decision-making process.

It would appear that the worlds of human development, economics, neurology, and sociology are coming together in ways that may greatly advance our understanding of how and why individuals make different financial decisions, especially concerning vulnerable populations. Psychologists and economists are perhaps equally concerned about individuals’ attitudes and behavior regarding savings, consumption, and debt. That concern among economist has led to a growing interest in learning theory and cognitive development—how can individuals

who do not appear to make rational financial decisions be taught to do so? By studying the economically disadvantaged, both sociologists and economists have found patterns in behavior and attitudes, regardless of origin, that have implications for financial behaviors and decisions. Our growing ability to look directly at the brain as decisions are made has confirmed the psychological importance of emotions and differences in the reaction to symmetric but opposing economic choices (e.g. gains and losses).

With this background on the different theoretical frameworks that hypothesize the roles of emotions, thinking, behavior, and culture in decision making, we now turn to the potential contributions to understanding financial attitudes and behaviors.

Arguably, the major contribution of psychoanalysis is the explicit link between childhood experiences and adult financial behavior. Psychoanalysis theory implies how and what financial decisions are made depends on very early childhood experiences. A child's experiences with caregiving adults shape the degree of self-control and persistence that emerge in the child. The focus on raising children and the development of behaviors and attitudes in young ages implies the importance of increasing parental education and skills. Policies that help parents be better parents, teach parents how to handle money, and promote the family conversation about finances would have lasting impacts on future generations.

A second contribution of psychoanalysis is the importance of conscious and unconscious emotions and associations in explaining human behavior. Humans behave differently because they have distinct emotional responses dependent on prior experiences that may not have even been directly related to money. Psychoanalysts observed the taboos in some families against money-related behaviors and argued that shame about money issues arose from how families dealt with other shameful issues. If talking or worrying about money is shameful, the individual

will not seek out financial help from an advisor, friends, or family. As an extension, this shame may encourage the individual to pretend their financial situation is different than the reality; such an individual may be more likely to accumulate credit debt to avoid difficult and perceived shameful financial conversation or decisions.

Although the choice of immediate pleasure over long-term gains has puzzled behavioral psychologists, behavioral economists, and financial literacy educators alike, psychoanalysis had a great deal to say on this topic. Some psychoanalysts speculate that this behavior may stem from the symbolic meaning of money, which can imply good, evil, power, status, and security (Lea and Webley 2006; Mason 1992; Rose and Orr 2007; Tang 1992). Thus, psychoanalysis implies that financial education that emphasizes knowledge and skills over emotional responses and symbolic meaning attached to money reduces the likelihood of long-lasting changes in financial behavior, especially among the most vulnerable population groups^{xix}

Psychosocial theory focuses on developmental conflicts that are also relevant to financial behavior: trust, will power, and self-regulation. Financial security requires one to trust banks and other financial authorities in being responsible with one's money (FDIC 2009). Guiso (2008) found that mistrusting individuals were less likely to buy stocks, and, if they did, they bought less. As evidenced by the recent financial crisis, the ability to ascertain who to trust is critical to making appropriate financial sound decisions.

Psychosocial theory supports financial literacy education for preadolescents, the stage at which will power and self-regulation is hypothesized to develop. According to this theory, the engagement in positive financial decisions is dependent on the positive identity, self-confidence, and independence that develops during adolescence and continues into adulthood. Here the role of primary caregivers is critical, but the social and cultural norms of the family and community

are also important. Falicov (2001) concluded that the social context of family life, individual boundaries, and human interactions play a significant role in how money is viewed among Latinos and Anglo-Americans. This is illustrated by, research showing that the percentage of stock ownership in a community makes an individual more likely to participate themselves (Brown et al. 2008).^{xx}

By focusing on consequences, learning theory describes how future behavior is encouraged or discouraged by the outcomes of similar behavior. When the individual makes a good choice, good things (rewards) happen. When the individual makes a bad choice, bad things (punishments) happen. These consequences result in learning and changes in behavior. Images taken using fMRI illustrate this, as the brain processes positive and negative outcomes differently. The implication is that persons experiencing negative financial outcomes may become more cautious than those experiencing positive outcomes. This may be beneficial in some circumstances but detrimental when, for example, being rejected for a loan deters future involvement in the formalized financial institutions and encourages interactions with high cost alternatives. Related is the different valuing of gains and losses, with behavioral economists offering evidence of the greater weight given to potential losses of what individuals have over equally probable gains. This response to negative versus positive rewards and the different weighting of potential losses and rewards are consistent with behaviors observed in low-income communities with limited access to financial services.

Key to the effect of punishment and rewards on behavior is time. Learning theory argues that immediacy of the consequence creates a strong connection to the behavior. '[T]he rewards for impulsive spending are immediate and salient; the punishments are typically delayed'

(Paulsen et al. 1977: 433). Additionally, because the rewards for saving require time, people may find other uses for extra money.

Learning theory also suggests breaking large tasks into smaller ones and focusing on specific changes that can be done to make a difference on the larger behavior. This characterizes some debt counseling where focus is on reducing debt components without full attention to the total debt. By breaking debt repayment plans into smaller tasks, the individual can focus on a specific issue (i.e. paying off the balance of the highest-interest credit card) and see the rewards before tackling the next behavior (i.e. paying off the balance of the second highest interest credit card).

Learning theory has provided a theoretical grounding for mechanisms such as rewards, punishments, immediacy, and breaking down larger tasks in changing behavior. Unfortunately, there has been little rigorous testing of whether these approaches are in fact more effective and whether their effectiveness varies across individuals whose values and attitudes may differ due to the family and community circumstances. .

Cognitive theory argues that the schemes and structures that are developed early will influence later cognitions. Financial decisions require abstract thinking, being able to plan ahead, and weigh possible outcomes, which may not be obtainable at early developmental stages. However, this more advanced decision-making process requires earlier understanding about fundamental financial concepts such as the purpose of money, the returns to savings, and the relative advantages of spending options, all of which are accessible concepts for young children. Scheinholtz et al. (2010, forthcoming) emphasized that effective education at all ages required taking account of prior knowledge, both to build on accurate knowledge and to address inaccurate prior knowledge that may lead to misunderstanding and irrational choices

Cognitive theory offers insight into the timing of financial literacy education. Cognitive development is hypothesized to proceed in sequential stages, with education about complex financial relationships most appropriate for the fourth stage of development when one is able to think abstractly (Scheinholtz et al. 2010, forthcoming). However, this sequential process may not be always age correlated, and thus it becomes important for adult financial education programs to consider the possibility of individuals being at different cognitive developmental stages. The preoperational stage, characteristic of very young children but also found in adults, is typified by the ability to think in only one dimension, leading to decisions made not based on the complexity of a situation but on the most salient dimension—on what is tangible instead of logical. This one-dimensional thinking limits the ability to view a situation objectively or from another point of view, such as in another space or time. In the next stage, concrete operational adolescents or adults can use complex logic, although their ability to anticipate likely consequences of a decision is not fully developed. This view of development implies the necessity to teach the decision-making process while explaining the consequences of financial decisions.

Fluid and crystallized intelligences parallel some of the themes in developmental psychology. They distinguish types of thinking in ways that are not unlike Piaget's conceptualization of the cognitive development. They provide a theoretical basis for life-long learning, while emphasizing the importance of 'initial conditions'—the physiological structure that determines fluid intelligence. Most important is the confirmation of the complex nature of cognition and reasoning and the role that early as well as later environments play in that development. The implication that some forms of intelligence increase throughout one's life suggests that the value of financial education persists throughout adulthood.

Neuroeconomics offers financial literacy educators a new way of looking at the decision-making process, potentially providing insight into differences across individuals in their response to financial incentives, choices, and risk. The interpretive activity of the brain—a physical and not necessarily a logical structure—is an important component of the ultimate decision made by the individual. It would appear that support and attention to these studies may be worthwhile in structuring financial literacy education programs and understanding the effectiveness of different approaches. These studies appear to confirm the role of emotions proposed by psychoanalysis and the idea that the brain is an aggregate of different types of intelligences. On the other hand, the current implications for financial literacy educating may be limited. Studies of brain processes necessarily involve small samples which may not fully characterize the processes across age, gender, and groups with different early life experiences. Assumptions about where in the brain reactions to external stimuli are recorded is itself in its infancy as is the interpretation of what signal levels mean for subsequent learning and behavior.

We may all be behavioral economists, believing in the power of rational choice but recognizing choices are constrained by a large variety of factors. These influences, some stemming from early childhood experiences and family and community values, result in bounded decision making. Many of these factors are drawn from the decades of thought given by psychologists to behavioral constraints, others confirmed by neurobrain studies that indicate underlying physical differences among those who exhibit different levels of risk aversion. The cross-fertilization of ideas among disciplines is becoming increasingly important to understanding financial decision making.

Research that focuses on the economically vulnerable seeks to understand the causes of observed behavior that is both persistent and seemingly contrary to the self interest of the

individual. Some argue that the values that underlie behavior are fundamentally different in these communities, suggesting unique challenges in developing financial literacy education material for these communities. Others have argued that these communities have the same values and goals, but are institutionally limited in options to which they have access for meeting those goals. Whether there is or is not a culture of poverty ignores the main issue of how best to increase financially secure behaviors for this population. Programs that aim to promote financial security for the poor, including financial literacy education, must tackle both dimensions. They must address the social and financial institutions that constrain options and opportunities for the poor as well as the long-held values, attitudes, and behaviors of the individual and the community around financial issues.

Conclusions

No single theory provides a comprehensive view of how financial decisions are made. Each draws on observable variations in decision making to offer hypothesized reasons for differences in the use of information by individuals. To different degrees and with different emphases, the combination of theories confirms the emotional, cognitive, behavioral, physiological, and cultural forces that shape decisions. Although the most advantageous decision may be mechanistically evident, individuals bring values, misperceptions, fears, and community shared goals to their decisions. They make these decisions within an environmental context that includes their earlier life experiences. Together, these theories appear to show that individual differences in life-circumstances and development make each person's financial situation and economic rationality unique. This, of course, does not advocate for the wide and costly use of individual-specific interventions, since individuals share experiences and similar brain processes. Rather, the value of examining these theories is to take from each theory explanations of

financial behaviors and decisions that are shared among them and that, over time, have grown in measurability and explanatory value. These explanations, which are now being tested in psychology, researched by sociologists, evaluated by behavioral economics, and confirmed by physical (brain function) evidence, become important for financial literacy education.

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ENDNOTES

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ⁱ Each stage is named for an unconscious pleasure seeking process in an erogenous zone that causes a conflict and, thus, creates a personality trait (Goldhaber 2000). These stages are oral (ages 0-1), anal (1-3), phallic (ages 3-5), latency (age 5-puberty), and genital (puberty into adulthood) (Goldhaber 2000).

ⁱⁱ These phobia include *fear of autonomy*, where individuals may make a bad investment because they depend on another person to make the important decisions; *fear of wealth*, when the individual believes that wealth is shameful; *fear of risk* when an ‘individual may be afraid of doing anything with their money for fear it will be the wrong thing’ (Krueger 1986:13). Finally, *addiction to acquisition of money* characterizing an individual driven by money, success, and the fame that brings to them.

ⁱⁱⁱ A famous example is the ‘marshmallow’ experiment in which four year old children were offered one marshmallow to eat now or two if they could wait. Children who waited scored higher on SAT scores years later (Shoda et al. 1990).

^{iv} Piaget described three forms of knowledge: scheme, concept, and structure. Schemes are actions or processes that are repeatedly used to attain goals or solve problems. Concepts, such as time, numbers and conservation, are not goal driven. Structure, refers to the organization and context of information. Each form of knowledge becomes more complex as the person gathers more information through physical action, empirical thinking, and social experiences as well as biological maturation (Byrnes 2008; Piaget 1983; Tracey and Morrow 2006). Eventually, the individual develops the ability to perform operations internally, without need to act on the object, through the use of logic.

^v In the first stage, newborns use their reflexes of looking, grabbing, and kicking to make sense of their world and maintain equilibrium. The end of this stage is the development of object permanence, which is the ability of the child to follow invisible objects, such as viewing the ball’s path as it rolls under the sofa. During the second stage, children use symbols, especially language, to make sense of the world. However, these children cannot use logic when problem solving, separate reality from fantasy, think abstractly about how to undo a task, or understand complex thinking. Furthermore, they are egocentric thinkers, because the child cannot ‘distinguish one’s own perspective from that of others’(Byrnes 2008; Crain 1992: 126). In the third stage, a child overcomes the limitations of the prior stage and is able to follow basic rules, use logic, and see other peoples’ perspectives. An adolescent in the last stage can apply the logical and tangible thinking to abstract and hypothetical items. People's thinking becomes more scientific in planning ahead and tracking all possibilities.

^{vi} The different trajectories of Gf and Gc would mean that single IQ measures could remain unchanged even as knowledge and abilities changed in fundamental ways.

^{vii} Behavioral Economics is defined by the Society for the Advancement of Behavioral Economics, as ‘...an association of scholars who are committed to rigorous economic analysis and are interested in learning how other disciplines—e.g. psychology, sociology, anthropology, history, political science, and biology—further our understanding of economic behavior’ (Department of Economics 2010).

^{viii} See Kahneman (2003) for a chronology of some of these published articles.

^{ix} Blood-oxygen-level dependence (BOLD) levels change when an area of the brain is activated and requires additional glucose and oxygen to support the activity. The fMRI scan has dominated the brain mapping field because of its relatively low invasiveness, no radiation exposure, and relatively wide availability.

^x Lewis’ concept of the culture of poverty was responsible in part for a closer look at the causes and consequences of poverty by U.S. policy makers. Michael Harrington’s *The Other America* (1963) influenced the Medicare and food stamp debates. A report issued in 1965 by the Department of Labor, of which Daniel Moynihan was then an Assistant Secretary, asserted that the weakened family structure was the major source of social and economic problems facing black communities and that ‘a national effort towards the problems of Negro Americans must be directed towards the question of family structure’ (1965). This report was influential in structuring the ‘unconditional war on poverty’ and the policies that followed (Johnson 2010).

^{xi} Opposing Lewis, Valentine (1968) reasons that the poor ascribe to the same social norms as do middle- or upper-class groups (e.g., preference for dual parent households) but the strength of those norms depends on the likelihood of attainment. ‘It is but a short step from [Lewis’]

position,’ Valentine writes, ‘to a belief that the allegedly distinctive culture patterns of the poor are more important in their lives than the condition of being poor’ (Valentine 1971: 214)

^{xii} Researchers have looked at different cultural components—cultural capital, frames, narratives, institutions, repertoires, symbolic boundaries, and values—to more narrowly define culture (Magnuson and Votruba-Drzal 2009; Small et al. 2010). However, implicit in cultural theory is the basic idea that a consistent set of group values, attitudes, behaviors, and norms are passed across generations.

^{xiii} See Frederick et al. (2002) for a discussion of other factors than may appear to be time preference differences but are due to other factors.

^{xiv} The young men in Young’s study, all in a job training program, had been unemployed for a majority of their working-age life, seemingly confirming their pessimism about job success. Nevertheless, their ideas of a ‘good job’ were consistent with those of nonpoor job seekers. Levitt and Venkatesh (2000) asked drug dealers about that work choice given that the typical drug-dealer’s income was equivalent to the wage of legitimate and less risky work in the neighborhood. The dealers expressed values similar to a middle-class worker, noting the need to ensure family financial security, the opportunity for promotion, the potential for making more money, and the prestige in the community.

^{xv} In the United States, 30 percent of children do not live with both parents, and that number nearly doubles for families living in poverty (U.S. Census Department 2009). African-American single-mothers, who have higher likelihood of being poor, are the least likely to be married before age 40 (59 percent) as compared to white single-mothers (82 percent) and Hispanic single-mothers (62 percent) (Graefe and Lichter 2002). There is less difference in expectations of

eventual marriage, and optimism that stems from shared views of marriage (Waller and McLanahan 2005).

^{xvi} Teitler (2009: 888) found that ‘once mothers leave welfare, their prospect of marriage reverts to that of mothers with similar socioeconomic characteristics who never were on welfare.’

^{xvii} She found that not marrying their child’s father is a rationally considered decision since marriage to a non-earning man is foolish, with cohabitation making it easier to separate both physically and financially if he becomes irresponsible, costly, unfaithful, or controlling. Since marriage should last ‘forever,’ mothers who marry low-skilled males must give up their dreams of upward mobility.

^{xviii} ‘[More] than half of black families have lived in the poorest quarter of neighborhoods *in consecutive generations*, compared to just 7 percent of white families’ (Sharkey 2008: 933)

^{xix} Klontz et al. (2008) studied the impact of psychological therapy on problematic financial behaviors. The six-day intensive therapy focused on attitudes, beliefs, and behaviors about money. The results showed fewer problematic behaviors, including reduced impulses, nervousness, anger, and social isolation, and less influence of money over the individual’s assessment of success, recognition, and status. While these results come from a non-randomly selected group of largely Caucasian and wealthy individuals, the study suggest the beneficial effects on behavior from addressing psychological issues around money.

^{xx} Brown (2008) estimates that a 10-percentage point increase in community stock ownership increases the probability of an individual holding stock by approximately four percentage points.

The Financial Literacy Research Consortium

The Financial Literacy Research Consortium (FLRC) consists of three multidisciplinary research centers nationally supported by the Social Security Administration. The goal of this research is to develop innovative programs to help Americans plan for a secure retirement. The Center for Financial Security is one of three FLRC centers and focused on saving and credit management strategies at all stages of the life cycle, especially helping low and moderate income populations successfully plan and save for retirement and other life events, including the use of Social Security's programs.

The Center for Financial Security

The Center for Financial Security at the University of Wisconsin-Madison conducts applied research, develops programs and evaluates strategies that help policymakers and practitioners to engage vulnerable populations in efforts which build financial capacity. The CFS engages researchers and graduate students through inter-disciplinary partnerships with the goal of identifying the role of products, policies, advice and information on overcoming personal financial challenges.

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