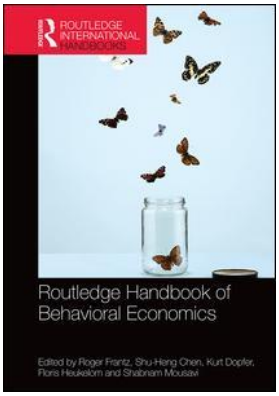

Routledge Handbook of Behavioral Economics

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Sean Leaver

Introduction

The purpose of "behavioural education economics" is to understand the psychological factors influencing educational choice and how individuals optimise these investments within a cognitively hard and complex decision space. Underlying behavioural education economics is the understanding that educational decision making is characterised by choices which are usually not repeated and rely heavily on heuristics to solve complex decisions in the absence of prior learning. By understanding the decision architecture underlying choices in education, causal mechanisms can be identified to guide policy interventions to improve academic outcomes which ultimately influence earnings and other life outcomes such as health. Given that individuals deploy heuristic based decision strategies to arrive at a "good" outcome in the face of incomplete information and limited time (Gigerenzer & Goldstein, 1996), it is important to understand the cognitive processes underlying these strategies and the impact of behavioural biases (Tversky & Kahneman, 1974) which lead to unintended social and economic consequences. Behavioural biases that can affect decisions in education include anchoring, framing, loss aversion, the availability heuristic and prospect theory. Behavioural education economics matters because for the last 30 years rational choice theory based education policy has failed to generate the expected economic outcomes, delivering only marginal overall benefits at best.

Choices in education are complex. Complexity arises from incomplete information, path dependency and the irreversibility of most choices in education. Choices in education are infrequent and rarely repeated. Each stage of investment, such as early childhood or school, comes with its own set of unique opportunities and constraints. Unlike conventional markets, investments in education cannot be readily resold or returned[1] and individuals usually do not benefit from delaying investments.[2] A level of complexity that would challenge seasoned economists not subject to everyday time constraints. Faced with limited time to make decisions and the infrequency of these choices, individuals have little opportunity to optimise utility through repetitive refinement, Arrow's (1962) "learning by doing".

The solution to decision making under complexity, limited time and few opportunities for learning is "bounded rationality". Faced with the uniqueness and complexity of investments in their education, the decision making process individuals undertake operates within the framework of heuristics and biases. Simon (1959) showed that even complex choices under certainty

are computationally hard to solve with decreasing marginal returns to computation. This leads to satisficing behaviour where the heuristic "close enough is good enough" is applied for choices which have an acceptability threshold: "Models of satisficing behaviour are richer than models of maximising behaviour, because they treat not only of equilibrium but of the method of reaching it as well" (Simon, 1959). Under uncertainty, conditions of low information availability require decision making to rely on a variety of time efficient heuristics to match the complexity and type of choice context. These may be general purpose intuitive heuristics that involve making inferences under uncertainty (Tversky & Kahneman, 1974), framing heuristics to reduce decision space complexity (Thaler, 1985), or "fast and frugal" decision heuristics (Gigerenzer & Goldstein, 1996) which reduce the complexity of rules applied.

The history of education economics has its foundation in Becker's (1964) seminal work on human capital where individuals, parents and students, are required to make a series of complex inter-generational and intertemporal choices to maximise their utility over time. Education economics has traditionally focused on the impact cognitive ability, wealth constraints, quality of teaching resources and family size have on choices (Becker & Tomes, 1976), the economic returns to investments in education (Mincer, 1958), non-market returns to education (Grossman, 2006), how markets in education should lead to improvements in education quality (Friedman, 1955), how choices in education can be optimised through community sorting (Tiebout, 1956), and how educational preferences associated with school choice are revealed through house prices (Black, 1999). The most important precursor to behavioural education economics are the econometric studies of the impact of educational vouchers (Epple & Romano, 1998) and socio-economic stratification of education (Archbald, 2000) indicating that there are factors rational choice theory is unable in its present form to account for. These studies indicate, for example, that contrary to rational choice predictions low socio-economic families fail to exercise choice and consequentially lag in educational outcomes despite the intervention of economic policies. To understand why policies have failed at the macro-level, focus has turned the mechanics of individual choice associated with investments in education. In a national US study of how students respond to different types of financing in their decisions to study and complete college Avery and Hoxby (2004) found that "a third of the students are probably under investing and our conservative calculations suggest that a typical mistake is worth $76,096 in present value". In particular, Avery and Hoxby found evidence of present bias in student's preferences for front-loaded[3] financial aid and positional framing in their preference for aid presented as scholarships as opposed to aid as grants.

While behavioural education economics is relatively new, its lineage dates back to Rosenthal and Jacobson's 1968 paper on the Pygmalion effect[4] in the classroom, Mischel et al.'s (1972) use of the "marshmallow test" to investigate self-control in children and Kagan et al.'s (1958) research into how exploratory behaviour and curiosity influences changes in cognitive ability over time. Consequently, the focus of education economics has turned to the role non-cognitive behaviours have on choices in education and subsequent labour market outcomes. "Non-cognitive skills strongly influence schooling decisions, and also affect wages given schooling decisions" (Heckman et al., 2006). For a deeper discussion of why non-cognitive skills matter see Heckman and Kautz (2012) and for their long term effects see Fredriksson et al. (2013).

At the heart of behavioural education economics is an understanding that academic outcomes are malleable. That investment decisions associated with education are primarily driven by non-cognitive behaviours and cognitive biases that affect participation in education, and subsequently motivations to commit resources to these investments and maintain these choices over time. This is contrary to the more deterministic view of neoclassical economics where genetic and wealth inherence play the primary roles in an individual's choices leading to academic and earnings outcomes (see Becker, 1976). Instead for behavioural education economics cognitive ability affects the

speed of learning but not the ultimate capacity of learning. Consequently, educational outcomes reflect Marcus" (2009) position that while genes pre-wire the brain, the brain is only pre-organised and remains malleable to experience (for instance synaptic pruning during adolescence).

Education is by its very nature a social process where social interactions shape both the willingness of individuals to invest in education and the returns from these investments. Humans are not merely efficient maximisers of self-interest but highly social animals that require new cognitive processes to handle the complexity of social interactions. Importantly, social cognitive processes are key to learning. Regions of the brain associated with social cognition have been shown to have evolved relatively recently in humans compared to our closest evolutionary cousins, the great apes (Tomasello, 2014). Social interactions, however, give rise to the fundamental economic problem of asymmetric information where we do not automatically have complete information as to the motivations and preferences of others. Our most recent cognitive machinery most likely represents an attempt to minimise these information constraints. However, the complexity of our social interactions is now accelerating over a relatively short period of evolutionary time. Automatic cognitive processes such as the general inference heuristics may not only be inappropriate for decision making in educational contexts but also very costly. Small initial errors arising from cognitive biases, such as teacher prejudice (e.g. Pygmalion effect) or peer stereotyping, can compound over time leading to significant student achievement gaps. Consequently, understanding the impact different cognitive processes have on the decision architecture linked to investments in education is crucial for the development of effective policy solutions.

Behavioural economics is generally viewed through the lens of how cognitive biases and heuristics can lead to errors and consequently sub-optimal choice decisions. However, choices in education are unique to the extent to which cognitive biases and heuristics have the capacity to shape preferences. Drawing on McFadden's (2001) choice process model (modified version Figure 26.1), the key insight of behavioural education economics is that social interactions inform "perceptions and beliefs" which via their impact on motivations and attitudes *shape economic preferences*. Critically, social positioning provides a reference point for asymmetric valuations and behaviour linked to loss aversion. This leads to the implication that preferences linked to choices in education appear to be endogenous.[5] Where underlying innate preferences "switch" in a manner similar to Gigerenzer and Todd's (1999) "fast and frugal" heuristics in response to changes in perceptions and beliefs linked to social interaction. Critically, the "if, then" logic of fast and frugal decision heuristics provides an explanation of the contextual responsiveness of identity threat impacting educational choices. Alternatively, broad based "affective states" influenced by emotions such as arousal are able to shape choice preferences in a similar way that a tide raises and lowers all ships (Loewenstein, 2005; Ariely & Loewenstein, 2006).

This is a major departure from the traditional economic approach to decision making where preferences are assumed to be innate and stable, and thereby exogenous. An explicit assumption that preferences are inherited and largely determined by biological processes: "tastes neither change capriciously nor differ importantly between people" (Stigler & Becker, 1977). Indeed, the explanatory power of the standard economic model "lies in its ability to explain most patterns of economic behaviour without having to account for experience or perceptions" (McFadden, 2001). In the standard economic model individuals collect information on alternatives, evaluate the probability of outcomes subject to (usually budget) constraints, and make a choice that reveals their preference.

However, if non-cognitive ability and personality traits shape economic choices in education and are themselves malleable (Kautz et al., 2014) then an economic understanding of preference endogeneity is needed. Specifically non-cognitive behaviour linked to achieving goals, investing effort and willingness to compete. Recently behavioural education economics has been subject

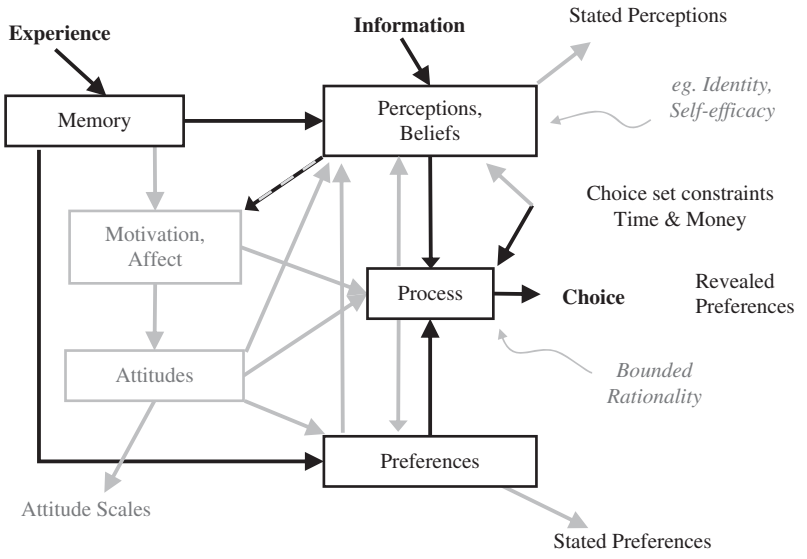

Figure 26.1 The choice process. Dark lines represent rational choice processes. Light lines represent psychological processes. The dashed line indicates how perceptions and belief are able to shape preferences via motivations and attitudes

Source: Modified from McFadden (2001).

to an extensive literature review (Koch et al., 2015) and a review of interventions (Lavecchia et al., 2014). The focus of this chapter will be on the three key non-cognitive behaviours associated with choices in education that play a role in the endogeniety of preferences and lead to malleability of educational outcomes: self-control, self-efficacy and identity.

Self-control: present bias, goals and commitment devices

The relevance of self-control to understanding economic behaviour was first raised by Strotz (1955) as far back as the 1950s, noting that individuals regulate their future economic behaviour in a manner that may seem costly. The implication being that rational behaviour should lead to consistent choices of optimal future outcomes by reason alone and without the need for additional costly commitment devices. From an economic standpoint, self-control allows individuals to avoid dynamic inconsistency in utility maximisation arising from preference reversals. In education, an example of time inconsistent preferences can be seen when a student procrastinates when studying and then subsequently regrets that choice (see Steel, 2007). Preference reversals occur in intertemporal choices when returns are discounted hyperbolically rather than exponentially (Ainslie, 1975; Thaler, 1981; Loewenstein & Prelec, 1992).

Self-control is the "effortful regulation of the self by the self" (Duckworth, 2011) and is key to an individual maintaining educational investments over time. The ability of children to delay gratification has been shown to be a reliable predictor of future academic success. Human self-control begins at school age between three and six years old, and represents a crucial stage of differentiation of humans from our nearest relative the chimpanzee (Herrmann et al., 2014). Suggesting that self-control is a key cognitive development in our evolutionary development, forming a unique component of human decision making processes associated with learning.

In Mischel et al.'s (1972) famous "marshmallow test" four-year-olds were given a choice between eating a marshmallow (or similar treat) now or waiting and receiving an extra marshmallow at the end of the experiment.[6] The marshmallow was placed on a table in front of the children and left unattended to maximise temptation. In this way self-control is seen as a finite resource which can be depleted. In a follow-up study a positive correlation was found between delayed gratification and SAT scores, with the correlations stronger for quantitative test scores than verbal test scores (Shoda et al., 1990). Importantly, studies have shown that self-control is a better predictor of academic outcomes than IQ (Duckworth & Seligman, 2005).

A New Zealand longitudinal study (Moffitt et al., 2011) of 1,000 individuals from birth to 32 years of age showed that self-control was a predictor of health, substance dependence, earnings and criminal behaviour independent of cognitive ability and socio-economic background. A much larger UK longitudinal study (Daly et al., 2015) of two cohorts totalling 16,780 individuals found that low self-control measured in child aged 7 and 11 years predicted unemployment in adulthood as far out as 50 years of age. However, the variation in probability of unemployment was strongest for individuals in their early 20s and declining over successive decades. Significantly, low self-control individuals experienced periods of unemployment 60 percent longer than experienced by high self-control individuals. An earlier study of 351 undergraduates by Tangney et al. (2004) similarly found a strong relationship between measures of self-control and higher academic results, better relationships, and less binge eating and alcohol abuse. The researchers suggest that self-control was important for conforming to social norms or alternatively self-control allows individuals to engage in activities that are socially desirable and require the overriding of self-interest.

It is important to note that self-control is also shaped by social interactions, particularly perceptions of trust. In a modified marshmallow experiment Kidd at al. (2013) added a preceding stage where perceptions of researcher reliability could be shaped. In this pre-stage, children were promised new crayons to draw with while they waited for the marshmallow experiment. One group received the new crayons as promised while the other group received old, clearly used crayons. Children who received the promised new crayons waited significantly longer than those who received the old crayons. Suggesting that self-control is strongly shaped by reasoned beliefs of the reliability of promises made by the researchers. Michaelson et al. (2013) found similar results for experiments with adults that showed social trust having a causal role in the willingness of individuals to delay immediate gratification.

Goal setting is a way to frame the decision space as a smaller set of variables, thereby reducing the cognitive load of complexity (see Thaler, 1985). Within these simpler decision spaces deliberate reasoned choices are more likely to avoid preference reversals. Importantly, when goals are framed as losses individuals are more likely to commit more effort to maintain choices in education. Aspirations framed as losses have been shown to lead to greater persistence by students in achieving their goals (Page et al., 2007). Morisano et al. (2010) showed that when university students asked to plan how to achieve their goals: "students who completed the goal setting . . . raised their grade point averages by 30 percent, and were much less likely to drop courses or quit university altogether." Goals can also take the form of self-imposed deadlines. In a study involving university students, Ariely and Wertenbroch (2002) found that students participating in an incentivised proof-reading task who evenly spaced their deadlines performed significantly better than those that relied on a final deadline for submission of their work.

Another way to overcome preference reversals is the use of self-imposed penalties as precommitments. Bryan et al. (2010) "define a commitment device as an arrangement entered into by an agent who restricts his or her future choice set by making certain choices more expensive" and does not provide a strategic advantage with respect to others. For example, students may

make binding commitments within groups that provide for penalties if shared individual goals are not achieved. These commitments devices can be very effective in maintaining school attendance and completion independent of any direct intervention by the school or authorities.[7]

Self-efficacy: cognitive biases and the role of incentives

In any decision involving investments in education there needs to be a consideration of the expected return with respect to expected risk over time. Critically, this requires an assessment of an individual's own or in the case of parents their child's ability to achieve an optimal return on their investment in education. The greater the confidence an individual has in achieving a goal, the more resources they will invest. This perception of one's own ability is called self-efficacy and the greater the belief in one's self-efficacy the more productive the individual's efforts (Eden, 1988). However, the complexity of choices in education mean that perceptions are likely to be affected by cognitive biases leading to a problem Bénabou and Tirole (2003) term *imperfect self-knowledge*.

In this regard, the general availability heuristics (Tversky & Kahneman, 1973) play a key role in how individuals resolve information uncertainty and make inferences about their own ability and the perceived ability of others. There are considered to be three general purpose heuristics underlying many intuitive judgements under uncertainty: "availability", "representativeness", and "anchoring with adjustment" (Gilovich & Griffin, 2002). These intuitive heuristics are highly efficient decision rules that achieve a good outcome quickly and with little cognitive effort but at the expense of sizeable type 1 errors.[8] For example in social groups, individuals are usually mindful of behaviours that lead to exclusion from a group. Misperceiving a behaviour as leading to ostracism is psychological costly, requiring effort, but is significantly less costly than missing cues that lead to ostracism (Williams, 2007). However, evolution always lags the environmental fitness space that individuals face and for humans our social interactions have grown in complexity in a relatively short space of evolutionary time. These biases are important for perceptions of group identity but also give rise to prejudice and stereotyping. Cognitive biases that favour false alarms over near misses to avoid social exclusion from tight knit groups in the past have now become a liability as social interactions expand.

Rosenthal and Jacobson (1968) were first to show how an anchoring and adjustment heuristic can affect the motivation of a student to perform and invest effort into their studies. A cognitive bias, the Pygmalion effect, where the greater the expectation placed upon a student the better they perform. In their experiments, teachers were given randomised reports on each student's ability. They found that a teacher's perceptions of a child's ability had a marked impact on the child's subsequent academic performance independent of the child's actual initial ability. This cognitive bias is similar to the "hot hand" effect in basketball (Gilovich et al., 1985) where misperceptions of luck as ability lead to reinforcing improved performance.[9]

In a similar study by Cervone and Peake (1986), undergraduate and high school students were randomly exposed to anchors linked to perceptions of their own ability. Students exposed to a high anchor which indicated high ability persisted longer in tasks than students exposed to a low anchor. Suggesting that task performance is strongly shaped by judgements of self-efficacy independent of innate ability. Perceptions of self-efficacy also influence course choice at university. Hackett and Betz (1989) found that perceptions of self-efficacy were strongly related to choice of mathematics majors at university independent of underlying achievement and performance in mathematics.

A solution to the problem of negative consequences of anchoring and framing is the use of incentives to reinforce positive outcomes. In the workplace the use of incentives is usually linked

to a particular job description with defined outcomes rather than individual self-assessment and are thereby less impacted by misperceptions of self-capacity (Bénabou & Tirole, 2005). However, the impact of asymmetric information "of the self by the self" on self-efficacy makes the use of incentives in education more complex and problematic than the traditional focus of incentives reinforcing productive behaviour in workplaces.

Incentives as intrinsic rewards relate to how individuals attribute value to a task with respect to their own personal motivation. The concept of "meaning" plays an important role in attributing value and can be shaped by the context of the task independent of an external reference. The best illustration of the behavioural dynamics behind the attribution of value through "meaning" is the classic novel *Tom Sawyer* by Mark Twain. Tom Sawyer faced with having to whitewash a fence contrived to reposition the activity from being a chore to a rare opportunity which his friends not only find pleasure in doing but also paid to do so (Ariely et al., 2006). This example goes to the heart of economics and the concept of scarcity. Scarcity is not necessarily an objective and fixed constant for all things. Scarcity can be shaped via perceptions of "meaning" and consequently effect the extent to which an individual invests resources into an activity such as a learning task.

Ariely et al. (2008) were able to show experimentally how "meaning" could be manipulated to influence effort and persistence in tasks. They used a simple incentivised experiment where the context of a task, the assembly of Bionicle toys, was changed but the payoffs remained the same. In one context, students were able to line up their completed Bionicle as they went. In the other context a research assistant would disassemble the toy immediately in front of the student after it was assembled.[10] Where Bionicles were disassembled in front of the students, persistence in tasks was significantly lower (7.2 units vs 10.6 units), required a higher marginal value for the last toy completed ($1.40 versus $1.01) and slower speed of construction (0.84/minute versus 0.25/minute).

Incentives as extrinsic rewards on the other hand frame choices with reference to externalised goals in order to overcome negative perceptions of self-efficacy. The impact of extrinsic rewards on academic performance has been shown to decline rapidly when delayed, and non-financial incentives are more cost effective with younger than older children (Levitt et al., 2012). Curiously, Levitt et al. found that framing rewards as losses did not increase the effect of the incentives on student performance. In a study involving 250 schools, Fryer (2011) found that financial incentives tied to academic inputs, such as reading, had a positive impact on academic performance while incentives linked directly to outputs, such as test results, were less effective. Financial incentives also have little impact on increasing participation in education when the objective is to reduce the cost of the choice decision (for school vouchers see Ladd (2002), for school subsidies see Behrman et al. (2005)). Suggesting that financial incentives work best when reducing the complexity of the choice decision rather the costliness of a decision. In an experiment involving 300 students Springer et al. (2015) found that non-financial rewards in the form of certificates of recognition where more than five times more effective at boosting attendance compared to financial incentives relative to a control group (completion of allotted hours: 16.77 percent control, 25.09 percent financial incentives, 59.97 percent certificates). Importantly while meaning and recognition trump financial incentives, meaning and recognition themselves are substitutes (Kosfeld et al., 2014). For a more extensive discussion of how context shapes the effectiveness of different types of incentives see Gneezy et al. (2011) and a review crowding out effects of financial rewards on intrinsic and social motivation see Deci et al. (1999).

Identity: behaviour in groups and social interactions

Choices in education by their very nature are dependent upon social interactions. These social interactions are complex and cognitively demanding due to the number of variables involved,

and problems of incomplete and asymmetric information. Consequently, "the ability to sort people (or objects) spontaneously and with minimum effort and awareness into meaningful categories is a universal facet of human perception essential for efficient functioning" (Bodenhausen, Todd & Becker, 2006). A person's identity defines who they are with regards to their social category, the "in-group" (Akerlof & Kranton, 2010). Having a common "identity" in social interactions significantly reduces the amount of information asymmetry present with regard to individuals within the group, thereby decreasing the complexity of decision making.

The same heuristics that are valuable in reducing complexity and cognitive load can also lead to bias-confirming assessments of inter-group relations giving rise to stereotyping. The perception of an individual's identity status via social cues can reinforce confirmation biases associated with maintaining a state of identity threat (Darley & Gross, 1983). Identity threat is one of the mechanisms that lie behind persistent achievement gaps in education outcomes (females: Spencer et al., (1999); African-Americans: Steele and Aronson (1995); students from low socio-economic backgrounds: Croizet and Claire (1998)). However being a socially context dependent behaviour, identity is localised and does not persist beyond its context frame. For example, low achieving boys when changing grades experience large gains when leaving behind old identity norms and expectations (Dweck et al., 1978). For an explanation of the decision processes that underlie poor academic achievement due to identity threat see Cohen and Garcia (2008).

One of the clearest examples of the critical nature of context framing and the malleability of academic performance due to social identity is an experiment by Shih et al. (1999). In their study a group of Asian-American women were randomly split into two groups where either the individual's gender or their ethnicity was made salient using semantic conditioning. Results were compared with a separate, randomly composed control group without any semantic conditioning. For the gender salient group individuals were asked to indicate their gender and answer gender related questions but excluding any reference to ethnicity. Questions for the ethnicity salient group were constructed in a similar manner while the control group answered questions without reference to either gender or ethnicity. Individuals in all groups then completed the same mathematics test. The researchers found that simply switching identity salience produced diametrically opposite levels of performance in the test. When identity was aligned with Asian ethnicity individuals achieved a higher level of accuracy than the control group (54 percent versus 49 percent). However, when identity was aligned with female gender individuals performed worse than the control group for exactly the same test (43 percent versus 49 percent). The important implication of this study is that individuals maintain multiple identities which can be triggered by social context leading to divergent performance in an academic environment.

Social identity has also been shown to affect the willingness of individuals to compete and thereby participate in educational choices. The gender gap in mathematics has been shown by Gneezy et al. (2003), and more recently Niederle and Vesterlund (2010), to be influenced by a screening effect where girls self-select out of mathematics subjects due to the perceived competitiveness of the environment. A similar gender gap has been shown for competitive entrance exams in university choice (Jurajda & Munich, 2011; Pekkarinen, 2014). In studies of girls attending co-educational and single-sex schools, the social context in which students make choices has been shown to change their risk preferences (Booth, Cardona-Sosa & Nolen, 2014). However, negative consequences of identity on academic performance can be remedied by either reducing the salience of a particular identity threat (Cohen & Garcia, 2005) or replacing conflicting identities with a new shared identity[11] (West et al., 2009).

Policy and future directions

Behavioural economics seeks to identify the causal mechanisms linked to non-cognitive behaviour that underlie choices in education so as to inform effective education policy development. Increasingly policy focus is turning to how behaviours can be shaped in early childhood where the gains from policy interventions are greatest. While there is extensive experimental and longitudinal evidence of the substantial positive benefits linked to non-cognitive skills and personality traits, little is known of the causal mechanisms involved and how they impact outcomes over the life of an individual (Heckman et al., 2012). In particular, a nuanced understanding that non-cognitive skills and personality traits that benefit academic outcomes may not necessarily be the same skills and traits that benefit future earnings in the workplace (Lee & Ohtake, 2014).

There is now a substantial and well established literature covering the behavioural economics of public policy (Shafir, 2012). However, most policy interventions in education take the form of either hard or light parentalism (see Lavecchia et al., 2014) which necessarily assumes that policy designers themselves are free of cognitive biases and the constraints of bounded rationality (Viscusi & Gayer, 2015). Light parentalism is most commonly recognised as "nudges" (Sunstein & Thaler, 2012) where preferred choices are framed as defaults.[12] While nudges are useful for policy design in areas such as health and savings, education is more challenging due to the complexity of social interactions that fall outside a formal regulatory framework. For education in particular, social interactions require a deeper understanding of how the macro-behaviour of individuals in groups (see Schelling, 2006) impact on investments in education.

Consideration also needs to be given to behavioural economic policies that increase choices in education rather than constraining choices by framing defaults. That behavioural economics can be used to increase choices in education is not new, although it may not have been recognised as such at the time. It can be considered that the introduction of Chapman's (1988) income-contingent loan scheme for financing higher education in Australia nearly 30 years ago was the first successful application of behavioural economics to education policy. The design of income-contingent loans being effective in overcoming choice inertia, loss aversion, identity threat and willingness to compete which effect participation in higher education by students from low socio-economic backgrounds and women. More consideration needs to be given to these types of "reverse-nudges" that increase both the availability of choice and the social benefits of these choices.

Notes

1 Unlike comparable large investments such as buying a home which are generally fungible and markets liquid.
2 As suggested by real options theory.
3 Front loading is where most of the financial aid is available in the first year of study.
4 A situation whereby the greater the expectation placed upon people, the better they perform.
5 For an example of a discussion on the endogeneity of preferences see Bowles (1998).
6 The marshmallow test is famous for the videos of children desperately trying to distract themselves from the temptation of eating the marshmallow in front of them.
7 From a TV program discussing education and at-risk youth. Student: "Last year we made a bet—there were three of us—and whoever missed a day of school first had to pay the other one $100." "It pushed us to come to school and we did and everything improved." www.sbs.com.au/news/insight/tvepisode/shepparton-3630.
8 Type 1 error is detecting an effect that is not present, while a type 2 error is failing to detect an effect that is present.
9 At least until the "luck" runs out and a "cold hand" leads to reinforcing poor performance.
10 Which Ariely et al. called the Sisyphus condition.

11 Such as replacing racial identities with a common university identity through activities such as sports teams.
12 Light parentalism is sometimes called "libertarian parentalism" while hard parentalism imposes mandatory choice outcomes.

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