THE UNIVERSITY OF CHICAGO

DO BELONGING AND SIGNIFICANCE MATTER IN LIFE OUTCOMES?

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This thesis is dedicated to Gary Becker, Harold Mosak and Hugo Sonnenschein. Gary was a superb lecturer. I was riveted by his delivery but at the same time would often feel that I was missing his train of thought. As a theoretical physicist, Gary's classes were very hard for me to penetrate. It was both a humbling and exhilarating experience—the type I find intriguing. So I sought the challenge to figure out how this great man reasons. I would not let any opportunity slip by and after having miraculously passed the core exam in Price Theory, I could not get enough Beckerian training. Gary's Human Capital lectures were magnificent. It was only then that I started to feel more confident in understanding his arguments and logic.

Gary graciously agreed to be on my committee. I remember his kind and gentlemanly manner so clearly. Gary would patiently listen to my ideas, letting me finish my arguments and only then pointing out where more work is needed. One time stands out in its hilarity. I finished my presentation and Gary pointed out to me that this was not even the beginning of the start of a thesis. I took it as his gentle prodding that he expects more from me. Sure enough after several months, I got Gary's green light. Here was the beginning of an idea. Unfortunately, he passed away just when I was revving up.

When I became acquainted with Adlerian philosophy, I learned that Harold Mosak was still alive. Never shying away from an adventure, I resolved to visit him. We had some extraordinarily fruitful exchanges. Harold, even though at the time in his mid-90's did not lose a beat to make me realize about the subjectivity of it all. I was so eager to measure things in objective ways, and Harold taught me that we all bring our own biases, and that the most honest thing we can do is to own up to them and to document them meticulously and transparently. Harold planted the seed within me to not dismiss biases and subjectivities out of hand. I was especially fascinated by how Harold analyzed particular case studies. He

had phenomenal insight into the human psyche. I am so delighted that Harold allowed me in. I am honored to have been his last student.

Hugo is dearly missed. I was shocked and dismayed when I learned about his passing. He was a dear friend and a mentor. But he was much more than that. He truly cared about people, and he enjoyed helping and making time certainly for me and for many others as well. He was a hugely encouraging presence on campus. I was looking forward to sharing my thesis with him and to incorporate his feedback.

This thesis is dedicated to Gary, Harold and Hugo, three kind, caring and generous researchers. I hope that it would have been met with their approval and that it is the beginning of the start of something.

Lessons can be learned even from negative character traits. Rabbi Dovber z"l of Meseritch[1] taught Rabbi Meshulam Zusya of Anapoli a number of lessons in Divine service from the thief:

1. He keeps to himself.
2. He is willing to place himself in danger.
3. Even the smallest detail is very important to him.
4. He works extremely hard.
5. He works quickly.
6. He is confident and hopes for the best.
7. If he does not succeed the first time, he will try again and again.

(Donner, Nosson Nota. Botzina Kadisha [The Holy Lantern]. Piotrkow: M. Zederbaum, 1912. First published by Zisel ben Eliezer Lipman of Naples, 1719-1800.)

1. Rabbi Dovber, later known as the Maggid of Meseritch.

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ACKNOWLEDGMENTS

It was not at all clear that I would ever be given the chance to work on my thesis, let alone writing it up. And so with tremendous gratitude to Hashem, I second Jacob's pleased amazement:

ראה פניך לא פללתי והנה הראה אתי אלוקים גם את זרעך.

(Genesis, Chapter 48:11)

The ancient text read every Passover Seder night captures my gratitude best:

אין אנחנו מספיקים להודות לך יקוק אלוקינו ואלקי אבותינו ולברך את שמך מלכנו על אחת מאלף אלף אלפי אלפים ורבי רבבות פעמים הטובות נסים ונפלאות שעשית עם אבותינו ועמנו...

(in Nish'mat "The Soul", Rabbi Adin Even-Israel Steinsaltz (2015), Passover Haggada, Koren Publishers, Jerusalem)

My life or death ordeal helped me rechannel my energies on what I value most. A lecture by Rabbi Yehiel Poupko years earlier—proved most consequential. He asked why weren't the Israelites promised Saudi Arabia, Bahrain or other resource-rich countries. Why were the Israelites promised a land where they would have to pray for rain, for sustenance, for everything? What would have been wrong to be promised the Nile? And he answered. Because G'd is interested in continuous, intimate connections. This thought sustained me during my darkest hours. It helped that the Talmud and our sages pointed out ways in how to improve and get back onto the nourishing and healing path.

So here we are. If a deeper sense of belonging turned my tide, literally changed everything, doesn't it stand to reason that others, especially children, if just given a chance will benefit too? My passion is to work tirelessly to make daily "classroom meetings" a reality in every classroom all over the world. While math and language skills are taught daily in schools, why wouldn't we not also have children immerse themselves in experiential social skill learning environments?

I am so grateful to Hashem to have been given the opportunity to start this mission by writing first about belonging and significance. May G'd grant me strength and endurance to continue this work by researching via future RCTs what works in uplifting children.

All of this would not have been set in motion, hadn't I had the great fortune to be part of John List's team. Were it not for John's weekly research meetings, welcoming me back after a prolonged absence, I quite likely would have dropped out of the program. John, your brown bag served as the desperately needed oxygen after a long dive to slowly ease me back into research, where I belong. John, thank you for being a kind and sensitive advisor. You wisely let me take my time, collect my thoughts, allowed me to recover from my ordeal—shielding me from any pressure. You defended me in front of an impatient faculty who wanted results or wanted me out of the program. And then masterfully, with tact and sensitivity you encouraged me, believing in me—and challenging me, pushing me onwards. John, you truly have impeccable timing. Thank you for your guidance and help all these years. Thank you for demanding a theoretical framework so that this thesis does not end up as just a garbled collection of facts—but to give it structure and direction. In fact, I was tinkering with many variations until I hit on the current simple one—literally during the closing days before my thesis defense. Thanks to your advice I honed in on mental health issues, which are a massively important subject.

Roger Myerson, I am so lucky to have you on my committee. You are sensitive, caring, encouraging, insightful. You always gave me your full attention whenever we talked. Your advice unlocked several key issues in my research. Thank you for introducing me to the magic world of Adam Smith. I caught the bug and am intrigued to learn more about this wondrous scientist and man.

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could be highly domain specific. Made aware by you of these subtleties and celebrating the richness of the BCS data allowed me to extract domain specific Intrinsic Capital. There is so much more to unlock from these nuances. Each interaction with you proves precious and deepens my understanding on psychological matters. It has been a sheer delight to interact with you Leigh.

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This leads me naturally to three supremely gifted French educators, Genevieve Carlier, Nadine Gaudin and Anne-Sophie Pourchez with whom I teamed up to turn the dream into reality. We are planning RCT experiments in French schools to determine the causal pathways in uplifting students. I am so honoured and delighted to have met these three remarkable and so hugely dedicated experts. With coworkers like that, the sky is the limit.

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I am so deeply grateful to my parents ז"ל who tried with all their might to create something meaningful after having emerged alive out of the inferno. They have survived it—out of all places—in Poland. Now I am ready and eager for dialogue and to understand their perspectives, but they are no more. Whenever I can help it, I will embrace life to its fullest and not hold back but engage, discuss and listen—that is the minimum I can do to honor my parents' memories.

I am blessed to count Tamara and Barry as my siblings. They teach me well about the myriad ways belonging and significance can be expressed.

Anna, Daniel, Matthew and Eleanor, what a wonderful gift G'd has bestowed on me to have you as my children. It was through you I learned perspective taking, because a love of a parent for their children is boundless. Situations humbled me into hearing you. Because of you this entire shift occurred in the first place, because whatever there was before was not working. It is never too late to engage in deep, meaningful dialogue. And the funny thing is that this then leads almost automatically to a much happier place, where each one is validated, feels heard and counted. One simply has to trust the process. Nothing can be rushed. These principles, learned with you have served me well in my research. I have been

thinking frequently on the synergetic aspects of my research into belonging and significance and how it is being reinforced by the deeply intimate. And how the deeply intimate is being informed by the research.

Which leads me to my wonderful, dear wife, Tanya. Were it not for her amazing sixth sense, I would have been long gone. I dreamed all my life to experience and find someone with whom I can share everything with—a type of submersive love. And here you were/are/will be, clear headed, noticing first that something must be checked, having worked under Dr. Gregory so that I was treated with compassion and care and not as another patient in some kind of experiment. And simply being there for me at every stage and turn in my life. But it goes so much deeper than that. When we travelled to the mountains, six months after my life changing surgery, I was at times restlessly pushing on during our hikes. But you had to examine every beautiful Alpine flower to minutest detail. It has taken me that long to appreciate this in all its majesty. There is infinite beauty around us at all times. We simply need to take the time to notice. And in this as in so many other spheres, I am the luckiest man on earth that I let you deep into me, my psyche, my essence. The wondrous thing about this is what an amazing two-way process it is. The influenced influence.

My restless mind, of course, sees the relevance in what we, as a couple, experience to what is being observed in classroom meetings—where not only the kids are uplifted but the teachers themselves. A type of virtuous cycle has been ushered in—just because the leader (in this instance the teacher) is wise enough to spark catalytically and encourage that type of change. You see here again the continuous, sustaining dance between the deeply intimate and my research.

Tanya, you sustain me, you give me vigor and life and meaning. I am so delighted to have you in my life so that we can wisely, jointly together, experience the many additional wondrous things that lie ahead on our endless, marvelous journey. I now know exactly where I belong and am significant—together with you. Thank you for your endless gifts that you

keep on giving.

ABSTRACT

In recent years there has been an increased appreciation of the predictive power of non-cognitive skills to adult, life outcomes. While these non-cognitive skills include all sorts of personality traits, one aspect of human capital, Intrinsic Capital (IC), has been understudied. IC is the subjective sense of belonging and significance of individuals to their social environments. This thesis demonstrates that IC predicts important life outcomes measured decades later—and that IC matters much more than IQ and personality traits combined. What counts is the subjective perspective of the individual. Even close, significant adults have much diminished predictive power on these outcomes. Since parents are so hugely influential in the formation of IC early on in a child's life, we also considered the effect of parenting styles on life outcomes. Parenting styles—as seen through the eyes of children—show predictive power to important life outcomes decades later. These results motivated our theoretical model to combine both traditional economic aspects with socioemotional ones. This led to some stark predictions which were partly corroborated by data.

CHAPTER 1

INTRODUCTION

"Dialogue is the elixir of life and chronic loneliness its lethal poison" (Lynch, 2000)

What can be done to encourage human flourishing? Aristotle extolled the virtuous, purposeful, well-lived life (Ameriks and Clarke (2000)). He preferred it over a hedonistic life, solely devoted to pleasure seeking, because it offers the person a sense of purpose and meaning. While Aristotle and the Greek philosophers examined the life worth living, centuries later Adam Smith ushered in the era of modern economics.

Smith contributed significantly to the discussion of human flourishing. His most studied work, The Wealth of Nations, introduces important concepts such as the division of labor, labor productivity, the power of free markets, and, importantly, introduces the notion of the invisible hand and the power of self-interested rational behavior (Smith (1791)). However, Smith also weighs in on the idea of human flourishing in some of his other work.

Adam Smith also wrote the Theory of Moral Sentiments (TMS) (Smith, 1759; Haakonssen, 2002). In the TMS, he discusses sympathy—the faculty of feeling and caring for others—and fellow-feeling as feedback loops. Feedback occurs in a system when output is routed back in as input in a self-correcting fashion.[1] Appendix A discusses more extensively Adam Smith's insights on feedback loops.

Combining Smith's two magna opera reveals an extraordinary fertile mind describing the human condition as highly complex. While under some situations the more material considerations get the upper hand, in other circumstances the person will act out of fellow-feeling and sympathy. Smith argues for a balance between the material and the socioemotional

1. A more formal definition, offered in 1951 by the American Institute of Electrical Engineers, states: "A Feedback Control System is a control system which tends to maintain a prescribed relationship of one system variable to another by comparing functions of these variables and using the difference as a means of control."

spheres. He laid the groundwork for a much richer economics which takes into consideration "the whole of the person"—i.e., a holistic approach to the human condition.

Smith's message was largely lost on the early pioneers of modern economics (Sugden, 2002), shown by their tendency to characterize human flourishing with simplistic, easy-to-quantify, objective measures, such as cognitive skills measures, achievement tests, education levels, lifetime earnings, etc.[2] A quintessential example of early life determinism were the highly consequential eleven-plus (11+) achievement tests in the U.K. These tests measured cognitive abilities at large, and were required of all 11-year-old children in the U.K. Based on these 11+ test results, students were channeled into prestigious and academic schools versus lesser outlets. For decades in the U.K., educational achievements have been foreordained by one battery of tests at age eleven. Likewise, in the USA, Herrnstein and Murray, in their influential book "The Bell Curve" (1994), claim that public policy cannot influence the skills that affect success in life (Herrnstein and Murray (1994)). For these authors IQ is innate and not malleable.[3]

During that era, many researchers relied on IQ and other cognitive measures to assess human potential. These measures were considered objective, and hence, deemed reliable. Only objective measures offered relevant, unbiased information, whereas subjective measures would not and furthermore would be harder to measure and would introduce undesirable biases. However, more accurate descriptions of human flourishing require more sophisticated tools than GDP, income, and physical wealth (Seligman, 2012). These researchers did not take into account that teachers' intimate knowledge of their students could enhance students' evaluations and not necessarily be a detraction riddled with subjective biases (Adler, 1930;

2. See Borghans et al. (2016)'s appendix for a list of 50 studies which consider achievement tests as a proxy for cognitive ability (IQ). Many of these studies attempt to predict lifetime outcomes.

3. Recent advances in neuroscience challenge this determinism. While in the past researchers believed that the brain develops and evolves only during critical periods, it has been recently demonstrated that the brain retains its' plasticity until much later in life (Gazzaniga, 2008; Siegel, 2020; Davidson and Begley, 2012)–thereby overthrowing conventional wisdom.

Dreikurs et al., 1982).

Fortunately, the tide started to change on non-cognitive, subjective measures of skills in the late 20th century. Psychologists have pioneered the investigation of non-cognitive skills (Terman, 1925; Murray, 1938; Terman and Oden, 1947; Almlund et al., 2011; Duckworth et al., 2011). They discovered the big five factor model of personality traits (see Digman (1990) and references therein). They found these to be predictive of life outcomes. In contrast to the economics literature, some of the early modern psychologists emphasized the importance of belonging and significance (b & s), see Adler (1964) and work by his disciples (Dreikurs (1971)). Belonging and significance is a term that attempts to capture the feeling or sentiment of connection and contribution of an individual towards their communities. Baumeister and Leary (1995) wrote their influential paper on the need to belong and Verhagen et al. (2018) showed that an unmet need to belong predicts adverse well-being in Dutch adolescent students. Walton and Cohen (2011) conducted experiments with minority students at colleges and showed that when b & s is increased, higher retention (less dropout) rates and higher academic outcomes ensue, and see Williams et al. (2020) for such a study with younger students. Walton and Wilson (2018) place these later studies in the wider context of wise interventions. By wise interventions, they mean those interventions that consider the individual's subjectivity—how people see themselves and their social situations—and which bring about lasting change to their subjective views. Similarly, an entire strand of literature exists which is devoted to showing that bonding, belonging, and attachment are biological needs (Gazzaniga, 1985; Decety, 2020; Goleman, 2007; Lynch, 2000).

In economics, the behavioral revolution started to shed light on the importance of dimensions of the human condition that had been neglected for decades. A case in point is the work of Kahneman et al. (1990) on the endowment effect and other challenges to neoclassical economic theory. More recently, work by Heckman and others showed that character matters

in predicting important life outcomes (Heckman et al., 2014; Gensowski, 2018; Bowles and Gintis, 1976; Borghans et al., 2008; Almlund et al., 2011). In the early 1990's, Cameron and Heckman (1993) were intrigued by why GED graduates were not performing as well as high-school graduates. The GED is an achievement test that if passed grants the status of high school graduate. What subsequent research unearthed is that GED graduates lack character (Heckman, Humphries, and Kautz, 2014), such as conscientiousness, perseverance, tenacity, grit, self-esteem; and that character matters for important lifetime outcomes (Borghans et al. (2016)). These studies and many more led us to the current status quo; it is now widely recognized that both cognitive and non-cognitive skills matter in human development.

Naturally, interest in more sophisticated methods capable of capturing holistic views of a person increased. While these include measures of non-cognitive skills, social behaviors, subjective preferences and beliefs, one important area remained understudied within the social sciences–namely, the subjective sense of belonging. Does belonging matter to important life outcomes? My thesis attempts to answer this question.

1.1 Belonging

This thesis studies belonging and what its' role is in later important adult outcomes. Belonging captures the way a person feels in connection to their environment. Without it, a person has no place in the world and their sense of being able to contribute is starkly diminished (lacking a sense of significance) (Walton and Cohen (2007)). That is why, along with a sense of significance, an individual's sense of belonging lies at the heart of a person's identity, self-narrative, and core beliefs. Adlerian psychology posits that the sense of belonging and significance is of central importance to an individual's core (Adler, 1964; Ansbacher and Ansbacher, 1964).

Attachment theory hypothesizes that infants become attached to adults who are sensitive and responsive to them (Bowlby et al., 1951; Ainsworth et al., 1978). Harlow (1958) and

his disciples (Harlow and Suomi, 1970; Suomi, 1971) demonstrated, albeit in unethical ways, primates' need to bond. They studied the response of infant monkeys to a "wire mother" holding nourishment versus a "cloth mother" made of soft, cushy pillows with no nourishment. The infants spent their overwhelming number of hours with their "cloth mother" and only ventured briefly to "wire mother" for food (Harlow, 1958; Harlow and Suomi, 1970; Suomi, 1971).

Baumeister and Leary (1995) argue that belongingness is one of the essential human needs. They show that belongingness appears to have multiple strong effects on emotional patterns and on cognitive processes, while they link lack of attachment to detrimental effects on health and well-being. More recently, Goleman (2006) emphasized the importance of social intelligence—the interconnectedness and social nature of the human species with its' uniquely social needs. Allen (2020) underscores the importance of psychological belonging (or lack thereof), discussing its positive (negative) effects from birth to adulthood transcending culture.

1.2 Intrinsic Capital

"Either companionship or death."

(Masechet Ta'anit 23.a)

My thesis focuses on studying the predictive power of **Intrinsic Capital** on long-term life outcomes. Intrinsic Capital (IC) is defined as ***the subjective sense of belonging and significance of the individual to their community and social environment***. The adjective "intrinsic" reflects the fact that what is captured by this term is nothing less than the essence, i.e., the core of an individual's conception of themselves and how they see themselves as part of their social surroundings. IC has capital-like properties (Robison and Ritchie (2010)) in that it is:

- durable
- facilitates a flow of services that have value
- transforms the function, meaning and value of the objects it operates upon
- has a residence
- physical and social laws regulate its creation.

Intrinsic Capital is one aspect of human capital that has been understudied. One reason for this could be that it is difficulty to measure. Another reason could be that it is a vast concept comprised of many distinct domains, such as family, work, friends and other communities. While an individual may feel deeply connected to their peers at school, they may simultaneously experience utter alienation towards their families/homes.

Intrinsic Capital is related to, yet fundamentally distinct from, Social Capital (Loury, 1976; Coleman, 1988, 1990; Becker and Murphy, 2000; Durlauf, 2002; Robison and Ritchie, 2010). Many conceptions of Social Capital involve social networks and other measures of social connections, while IC captures the sense, the feeling residing inside the individual on how they feel towards a community (whatever domain it may be— their world, peers, school, family, workplace, etc.). Whether that feeling is being reciprocated, "justified", delusional, etc., is irrelevant to IC. Yet these considerations weigh heavily in most measures of Social Capital. In that respect, assessing a "run of the mill" Social Capital measure is far more complex than assessing IC. These daunting complexities forced researchers to describe Social Capital in terms of measurable behaviors and/or observable attitudes.

The main distinctions between IC and Social Capital are manifold. First, generic Social Capital conceptions consider social networks, while IC probes the mind of the individual. Second, Social Capital conceptions by and large focus on observable behaviors and measurable attitudes. In contrast, IC probes the inner workings of a single individual's mind.[4] In

4. In case one is interested to go beyond self-reports, one promising research avenue could be to combine

other words, IC is trying to mine the individual's mind, while Social Capital is trying to capture observable social network effects.

There exist a plethora of definitions of Social Capital. Narayan and Pritchett (1999)'s definition is: "Social Capital is the quantity and quality of associational life and the related social norms." They measure Social Capital by the density of connections (memberships to various organizations) observed in Tanzanian villages. Thus their definition uses social networks to characterize Social Capital. In contrast, IC resides inside the individual's mind.

Coleman (1988, 1990) defined Social Capital as a variety of different entities with 2 elements in common: namely, some aspect of social structure and the ability to facilitate certain actions of individuals who are within the structure. Coleman's Social Capital is anything that facilitates individual or collective action, generated by networks of relationships, reciprocity, trust, and social norms. Coleman emphasizes that Social Capital inheres in the structure of relations and that it is not lodged in the individuals themselves. In contrast, IC resides inside individuals.

Putnam (2000) defined Social Capital as "connections among individuals—social networks and the norms of reciprocity and trustworthiness that arise from them." Putnam views Social Capital as a key component to build and maintain democracy. Putnam too uses social networks to describe Social Capital. In contrast, IC does not require any actual social networks.

Besides Social Capital, many studies have focused on multiple aspects of human social domains. The references listed below are by no means exhaustive, but meant to offer just a taste of the breadth and richness available. There are rich strands of literature on peer effects (Lazear, 2001; Sacerdote, 2011; Lavy and Schlosser, 2011; Hoxby and Weingarth, 2005; Tincani, 2017; Agostinelli et al., 2020; List et al., 2020), social interactions (Brock and Durlauf, 2002, 2007; Blume, Brock, Durlauf, and Ioannides, 2011; Blume, Brock, Durlauf,

neuro-scientific studies with IC investigations–such as have been done recently for other noncognitive skills (Tong et al., 2016).

and Jayaraman, 2015), social and economic networks (Jackson, 2008; Calvó-Armengol et al., 2009; Banerjee et al., 2013), social identity and group behavior (Coleman, 1961; Akerlof and Kranton, 2000, 2002, 2005; Bénabou and Tirole, 2011; Chen and Chen, 2011; Charness and Chen, 2020), social economics (Becker, 1974; Becker and Murphy, 2000), social norms (Frey and Meier, 2004; Allcott, 2011), and social preferences (Fehr and Fischbacher, 2002; Smith, 1964), among many others.

My research differs from the research mentioned above. I do not consider social networks. My primary concern is "mind mining". How does the person see himself/herself belong? How does this person perceive they can contribute to their communities? Are these contributions socially productive ones or on the useless side of things? In other words, this thesis is trying to probe the mental worlds of the subjects. As such, it is well positioned to probe questions pertaining to mental health. Adler coined the term Gemeinschaftsgefühl, which has been translated as Social Interest or Community Feeling, and which captures the totality of a person's productive relationships and interactions with their environments (Adler, 1964; Ansbacher and Ansbacher, 1964). Intrinsic Capital is one important component of Gemeinschaftsgefühl.

1.3 Mental Health

The World Health Organization (WHO) described mental health as "a state of well-being in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (World Health Organization (2001)).[5] It then expanded the concept further to

5. What is meant by well-being? Recent studies show that subjective well-being harbors two aspects: emotional well-being (hedonic perspective) and life evaluation (eudaemonic perspective) (Ryan and Deci, 2001; Tennant et al., 2007; Kahneman and Deaton, 2010). Emotional well-being captures one's current emotional state, that is, one's current feelings of pleasure, happiness, joy, sadness, stress, anger, etc. Life evaluation is a more purposeful examination of one's life–what are one's long-range goals and whether one is on a path to achieve them. This conception of well-being is sometimes referred to as the eudaemonic perspective, a term coined by Aristotle to describe a virtuous life, pregnant with meaning and purpose

include that mental health is more than the absence of illness; it is tightly linked to physical health, and forms an integral part of general/overall health (World Health Organization (2004, 2005)). The WHO argues for dismantling the artificial barriers existing between mental and general health–advocating for holistic solutions to mental health issues.

Before these WHO reports, mental health and mental illness were largely conceptualized outside public health. The WHO directed our attention to viewing these as not separate issues but as a single holistic one. The WHO's "Mental health action plan 2013-2020" (World Health Organization, 2013) integrates mental health promotion, mental illness prevention, treatment, and rehabilitation into"global mental health". Research shows that mental health disorders tend to start early in life, are chronic, and cast long shadows over family and economic outcomes (Ettner et al., 1997; Hamilton et al., 1997; Moussavi et al., 2007; Alonso et al., 2011; Currie et al., 2010). It follows that mental health problems have economic implications. However, the economic costs of mental illness are not easily estimated (Insel, 2008; Bloom et al., 2011).

Globally, it is estimated that 264 million people suffer from common mental health conditions such as depression (World Health Organization, 2021). In the US, nearly 1 in 5 Americans has some type of mental health illness (National Alliance of Mental Illness, 2021). In 2019, the spending on mental health treatment and services in the US amounted to $225 billion (Open Minds, 2020). The CDC reports that the Covid-19 pandemic only exacerbated these numbers (Czeisler et al., 2020). While staggering, these estimates alone do not account for indirect costs. Roughly, the WHO estimates that the costs of these conditions is of $1 trillion per year in lost productivity globally (World Health Organization, 2021). Sadly, the global toll of mental health issues is expected to surpass $6T annually by 2030 (Bloom et al., 2011). However, studies have found that for every $1 put into scaled up treatment for common mental disorders, there is a return of $4 in improved health and productivity (Chisholm

(Ameriks and Clarke (2000)).

et al., 2016). Given these estimates, it is difficult to overstate the importance of investments in mental health prevention, but also on treatment. We attempt to shed light on one of the mechanisms thought to be predictive of mental health outcomes, Intrinsic Capital.

While poor mental health causes are almost unimaginably varied and complex, Adlerian psychology predicts that the prevalence and severity of symptoms will be reduced when increasing Gemeinschaftsgefühl (Adler, 1964). Johnston et al. (2013) studied mental health across 3 generations using the British Cohort Study (BCS). They find significant intergenerational persistence in mental health (50% higher for the maternal line), which increases with the age at which the Cohort Member (CM), i.e. child, was exposed to episodes of maternal mental health problems. However, some results are not robust to simple checks when relevant controls are included. Based on the theoretical model introduced in Chapter 4, we conduct intergenerational analyses combining both income and malaise, i.e. mental distress.

1.4 Summary

In summary, this paper contributes to several strands of literature. First, we propose a re-examination of the literature on the power of cognitive and non-cognitive skills in predicting life outcomes. We show that an overlooked key component, albeit subjective and difficult to measure, intrinsic capital, is a strong predictor of subjective outcomes (i.e., mental health, well-being, life satisfaction) in adulthood. Second, we contribute to the literature on intergenerational transmission of wealth and human capital by proposing a simple theory that models parental investments in children outcomes. Lastly, we contribute to a growing literature using longitudinal studies in the social sciences to investigate human capital, mental health and economic outcomes.

The rest of this thesis is organized as follows. Chapter 2 provides an overview of the data and the empirical analyses. Chapter 3 presents results from a simple examination of the BCS data. Chapter 4 proposes a theoretical model of intergenerational investment

in two important dimensions of human capital. Chapter 5 presents results of applying the theoretical model to the BCS data. Chapter 6 contains a discussion of the evidence presented in this paper and a brief conclusion.

CHAPTER 2

DATA AND CONCEPT CONSTRUCTION

The British Cohort Study (henceforth, BCS) is a longitudinal survey which follows the lives of approximately 17000 people born in England, Scotland, and Wales in a single week of 1970. Initially, the goal of the study was to collect information at birth to compare neonatal morbidity rates and social and biological characteristics of mothers in 1970 with results from the National Child Development Study conducted in 1958. Shortly after the data collection in 1970, the study was taken over by scholars at the University of Bristol, who conducted the first follow-ups (sweeps) during the first decade of what was then known as the Child Health and Education Study. During the subsequent decades, the study was funded and conducted by different institutions, until officially becoming the British Cohort Study in the late 90s. Currently, BCS is housed at the Centre for Longitudinal Studies, which is part of the University College London (UCL), funded by the Economic and Social Research Council. Additionally, recent sweeps have received complementary funding from the Medical Research Council and the British Heart Foundation. For a more detailed history of the BCS, see Elliott and Shepherd (2006).

The study provides data that inform research on important policy areas such as social mobility, education, economic insecurity, and many more fields within the social sciences. Specifically, the BCS collects information on health, physical, educational and social development, and economic circumstances of Cohort Members (CMs) and their parents. Beyond the baseline data collected at birth (1970), several sweeps have followed. As of the time of this writing, 10 sweeps have occurred throughout CMs' lives, at ages 5, 10, 16, 26, 30, 34, 38, 42, 46, and 50. In practice, the last sweep for which data are available is the age 46 (2016) sweep. The Covid-19 global pandemic has delayed data collection and dissemination from the sweep at age 50, which was planned for 2020. In this paper, while I tend to focus on specific sweeps for my main analyses (e.g., ages 10 and 16 sweeps for childhood measures

and age 46 sweep for adult outcomes), I use data from virtually all sweeps in my various robustness checks.

BCS data has been used extensively by scholars from various disciplines. The bibliography tool provided by the Centre for Longitudinal Studies[1] lists over 1000 publications which use BCS data. The closest to my research is Borghans, Golsteyn, Heckman, and Humphries (2016). The authors use data from various longitudinal studies to explore the power of traditional achievement tests (i.e., cognitive skills tests, IQ, etc.) and non-cognitive skills such as personality traits in predicting several outcomes of interest. In particular, the authors find that personality is relatively more important in predicting grades; and IQ is relatively more important in predicting scores on achievement tests. Interestingly, however, personality is generally found to be more predictive than IQ on a variety of important life outcomes.

These findings warranted further exploration of personality traits and other non-cognitive skills in predicting important life outcomes, both objective and traditional outcomes (e.g., wages, physical health) and subjective, less traditional outcomes (e.g., life satisfaction, well-being, etc.). I build off of Borghans et al. (2016) analyses, focusing on the BCS data, to explore the predictive power of Intrinsic Capital on several outcomes of interest.

My main empirical strategy relies on a simple linear regression model as follows:

$$Y_{i\tau} = \beta_0 + \beta_1 X_{it} + \gamma\, Z_i + \epsilon_{i,\tau,t}, \tag{2.1}$$

where $Y_{i\tau}$ is an outcome of interest of CM i at age τ (e.g., Malaise score at age 34), X_{it} is a measure of IC for CM i at age t, Z_i is a vector of CM i's controls (i.e., traditional cognitive and/or non-cognitive skills measures such as IQ or personality traits), and the error term is denoted by $\epsilon_{i,\tau,t}$.

A key portion of my research was the creation of measures given the available BCS data. Psychologists, educators, BCS professionals, other social scientists and economists

1. https://www.bibliography.cls.ucl.ac.uk/Bibliography

were consulted to characterize and quantify these elusive measures. I first discuss these measures—e.g., IC, parenting styles, symmetry in interests—before reviewing those either already included in the BCS data or constructed according to BGHH's recipes (Borghans, Golsteyn, Heckman, and Humphries (2016)).

In creating my measures of interest, my methodology was simple. After choosing the relevant set of questions for each concept,[2] always in close consultation with experts, I re-code the data so that higher values denote higher levels of the measure of interest (e.g., a negative answer to the question "do you often feel lonely at school?" received a higher value, since it is suggestive of higher IC).

A factor analysis with these re-coded variables revealed the latent factor—that is, the underlying concept of interest. Each concept was determined in this fashion, except the determination of the Symmetry In Interest measures. These were obtained by summations as described later in detail. Below is the list of questions used in each of these conceptualizations.

2.1 Intrinsic Capital

In order to study this multidimensional concept in as many ways as possible (given the data constraints), I consider different versions of this measure as robustness checks. It is possible, and indeed frequently the case, that an individual feels "at home" in one domain yet alienated in another. To allow such nuances, I introduce IC-home which measures an individual's subjective sense of belonging and significance at "home and in general", and IC-school which measures their subjective sense of belonging and significance at school. The generic IC is determined by a factor analysis applied to all items—both those used to construct IC-home and those used to create IC-school.

Not only are we able to construct IC at different time points (sweeps) and for different

2. Appendix B offers some details on the deliberations that went into constructing these concepts.

domains, we were even able to construct IC from different perspectives. Chapter 3 compares the predictive power of self-perspective versus mother's or teacher's perspective and demonstrates the much superior saliency of self-perspectives when it comes to subjective outcomes.

IC has been constructed from CMs self-reports when CMs were 10 and 16 years old, denoted as IC(10), IC(16), respectively. Later chapters will mainly use IC(16) which will be shortened there to IC when no ambiguity arises. Only where potential confusion may arise, the explicit IC(16) will be used to disambiguate. Mother's perspective on her child's (i.e., CM's) IC are available when the CM was 5, 10, 16 years old, and will be denoted by IC(5, mom), IC(10, mom), IC(16, mom), respectively.

2.1.1 Intrinsic Capital - Cohort Member's Perspective

Below is the list of questions used to create the IC(16) measure—seen through the CM's perspective—broken down by the IC-home and IC-school domains.

IC(16) Questions - School Domain

- Do you often feel lonely at school?
- Do other pupils in the school often fall out with you?
- Do you think that other pupils in the school often say nasty things about you?
- Do you often feel sad because you have nobody to talk to at school?
- When you have to say something in front of teachers, do you usually feel uneasy?
- When you have to talk in front of other students, do you usually feel silly?
- When you want to tell a teacher something, do you usually feel silly?
- Do you often have to find new friends because your old friends are with somebody else?
- Do you usually feel that it's almost useless to try in school because most students are cleverer than you?
- Are you surprised when your teacher says you've done well?

- Do you usually get low marks, even when you study hard?
- When you meet new people of your own age and sex, how do you feel?
- Whether or not you've got a girlfriend/boyfriend, have you got a best friend who you feel you can really trust?

IC(16) Questions - Home/General Domain

- Do you think that your parents usually like to hear about your ideas?
- Are there lots of things about yourself you would like to change?
- Do you feel that most of the time it's not worth trying hard because things never turn out right anyway?
- How would you describe your feelings about living at home with your parents?
- I am lonely
- Been feeling reasonably happy all things considered
- Felt that I am playing a useful part in things
- Been feeling unhappy and depressed
- Been losing confidence in myself
- Been thinking of myself as a worthless person

When CMs were 10 years old, enough self-reported items exist to construct domain-specific IC measures, home and school. The generic IC(10) is obtained by combining all these items.

IC(10) Questions - Home/General Domain

- Do you think that your parents usually like to hear about your ideas?
- Are there lots of things about yourself you would like to change?
- Do other people often think that you tell lies?
- Do you worry a lot?
- Do you feel that most of the time it's not worth trying hard because things never turn out right anyway?
- Are you often blamed for things which just aren't your fault?

- When bad things happen to you, is it usually someone else's fault?
- When someone is very angry with you, is it impossible to make him your friend again?
- When nice things happen to you is it only good luck?

IC(10) Questions - School Domain

- Do you often feel lonely at school?
- Do other children often break friends or fall out with you?
- Do you think that other children often say nasty things about you?
- When you have to say things in front of teachers, do you usually feel shy?
- Do you often feel sad because you have nobody to play with at school?
- When you have to say things in front of other children, do you usually feel foolish?
- When you want to tell a teacher something, do you usually feel foolish?
- Do you often have to find new friends because your old friends are playing with somebody else?
- Do you usually feel that it's almost useless to try in school because most children are cleverer than you?
- Are you surprised when your teacher says you've done well?
- Do you usually get low marks, even when you study hard?

2.1.2 Intrinsic Capital: Mother's Perspective

IC has been constructed from mothers' perspectives in 3 instances, when CMs were 5, 10, 16 years old. The items used to construct IC(16, mom) are:

IC(16, mom) - Mom Questions
The preambles to mother's self-questionnaires basically read: "Below is a series of behaviours which can apply to young people. Please indicate how much this behaviour applies to your teenager:"

- Often destroys others or own belongings
- Frequently fights with others

- Not much liked by others
- Often worried; worries about many things
- Irritable; is quick to fly off the handle
- Often appears miserable, unhappy, tearful or distressed
- Sometimes takes things belonging to others
- Is often disobedient.
- Is fussy or overparticular
- Often tells lies
- Bullies others
- Requests must be met immediately; easily frustrated
- Interferes with the activity of others
- Is sullen or sulky
- Cries for little cause
- Changes mood quickly and drastically
- Displays outbursts of temper, explosive or unpredictable behaviour

IC(10, mom) - Mom Questions
Below is a series of behaviours often shown by children. Please indicate how much this behaviour applies to your child:[3]

- Has temper tantrums (that is, complete loss of temper with shouting, angry movements, etc.)
- Often destroys own or others' belongings
- Frequently fights with other children
- Not much liked by other children
- Irritable. Is quick to "fly off the handle"
- Often appears miserable, unhappy, tearful, or distressed

3. At age 10, scales ranged between 0 to 100, except for the first item whose response was governed by a traditional 4-valued Likert scale.

- Sometimes takes things belonging to others
- Cannot settle to do anything for more than a few moments
- Often tells lies
- Bullies other children
- Requests must be met immediately; easily frustrated
- Interferes with the activities of other children
- Cries for little cause
- Changes mood quickly and drastically
- Displays outbursts of temper, explosive or unpredictable behaviour

IC(5, mom) - Mom Questions
The by now familiar introductory statements are given followed by:

- Has temper tantrums (that is, complete loss of temper with shouting, angry movements, etc.)
- Often destroys own or others' belongings
- Frequently fights with other children
- Not much liked by other children
- Irritable. Is quick to "fly off the handle"
- Often appears miserable, unhappy, tearful or distressed
- Sometimes takes things belonging to others
- Often tells lies
- Bullies other children

2.1.3 Intrinsic Capital: Teacher's Perspective

IC has been constructed from teachers' perspective when CMs were 10 years old. The items used to construct IC(10, teacher) are:

IC(10, teacher) - Teacher Questions
Teachers were asked to report on a sliding scale between one extreme to the opposite extreme—in other words, teachers responded with a vertical line through the printed horizontal line to show how much a question applied (or not) to the CM at age 10:

- Does the child tend to use gestures and other non-verbal communication (aggression, emotional display, etc.) in preference to verbal language? From "Nearly all the time" to "Not more than is usual for age-group".
- When child describes his/her own experiences to you, do the ideas come out coherently in a sequence which makes sense for the listener? In other words, how are the child's thoughts organised? From "Very poorly" to "Very well".
- From "Is highly popular with his peers" to "Is not at all popular with peers."
- From "Has no friends" to "Has many friends."
- From "Very cooperative with peers" to "Unwilling to co-operate with peers."
- To what extent can you negotiate with the child a change in his behaviour. From "Very easily" to "Not at all."
- Displays outbursts of temper, explosive or unpredictable behaviour. From "A great deal" to "Not at all."
- Teases other children to excess. From "A great deal" to "Not at all."
- Cries for little cause. From "A great deal" to "Not at all."
- Shows perseverance; persists with difficult or routine work. From "A great deal" to "Not at all."
- Interferes with the activities of other children. From "A great deal" to "Not at all."
- Is fussy or over-particular. From "A great deal" to "Not at all."
- Changes mood quickly and drastically. From "A great deal" to "Not at all."
- Is excitable, impulsive. From "A great deal" to "Not at all."
- Is worried and anxious about many things. From "A great deal" to "Not at all."
- Pays attention to what is being explained in class. From "A great deal" to "Not at all."
- In relations with others appears to be miserable, unhappy, tearful or distressed. From "A great deal" to "Not at all."
- Quarrels with other children. From "A great deal" to "Not at all."
- Shows lethargic and listless behaviour. From "A great deal" to "Not at all."
- Destroys own or other children's belongings. From "A great deal" to "Not at all."
- Bullies other children. From "A great deal" to "Not at all."

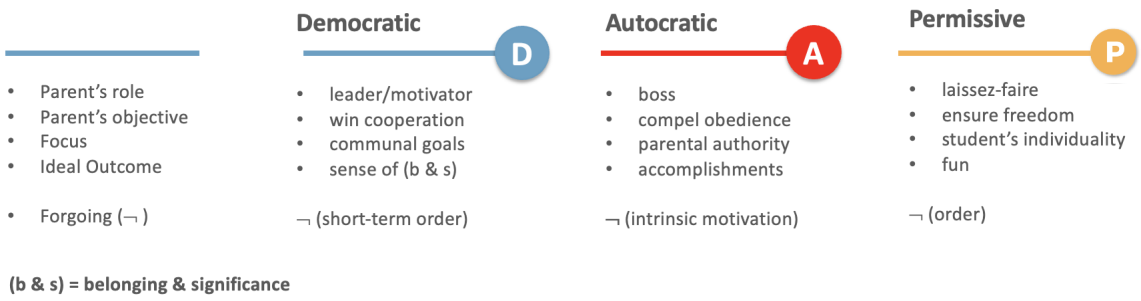
- Is sullen or sulky. From "A great deal" to "Not at all."
- Request must be satisfied immediately—is easily frustrated. From "A great deal" to "Not at all."

2.2 Parenting Styles

The BCS data is so rich and bountiful that it was possible to construct measures of IC and domain specific ICs. Our understanding of such complex concepts can be enriched by employing further lenses. On that note, we consider an additional, complementary measure of children's sense of belonging and significance, parenting styles.

Psychologists know that children form their individual lifestyles early on (Ansbacher and Ansbacher, 1964; Stern, 1985). How they attach to their mother serves as a good example. The earliest caregivers, usually the parents, are highly influential during the formative, early years. How these relationships are interpreted by the child sets the tone on their sense of belonging and significance throughout their lives.

Figure 2.1: Parenting Styles



The literature classifies parenting styles into three major categories: autocratic, democratic (sometimes called authoritative), and permissive (Ansbacher and Ansbacher, 1964; Dreikurs and Soltz, 1964; Baumrind, 1967; Doepke and Zilibotti, 2017). We follow the literature in creating these three parenting styles,[4] summarizing the features of each style in

4. Appendix C describes our construction of these 3 parenting styles (PSs) from mothers' perspectives

Figure 2.1. Because most of the relevant teenage CMs' self-reported items asked about parents in general—on the few occasions where mother or father or both were explicitly mentioned, we decided to collapse CMs' responses onto the relevant PS (as long as any of these were ticked off by the CM) and not to differentiate between father, mother or both.

We construct these 3 parenting styles (PSs) from CMs' self-reports at age 16 as follows:

Democratic Parenting Style

- With whom would you share personal problems with? Mother or Father or both indicate democratic parenting style:
  - About school/college
  - About money
  - About family
  - About health
  - About friends
  - About career
- My parents allow me freedom of action within reason
- My parents are understanding. I can talk to them
- My parents are loving/caring/look after me
- My parents are helpful/good in a crisis
- How often do you spend time with your parent(s)? By this we mean talking together, doing things together, going out together etc. because you want to:
  - I do things together with my mother alone
  - I do things together with my father alone
  - I do things together with both of my parents

Autocratic Parenting Style

- My parents expect me not to go to parties or discos (True)
- My parents expect me to go with them to see relatives or go on holiday even if I'd rather do something else

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when the CMs were 5 years old.

- My parents treat me like a child
- My parents are strict/bossy/have too many rules
- Some parents are very strict, and others give lots of freedom. What about yours? (Tick one of the 7 boxes below- from "Very strict" to "Very free")[5]
- Is there anything important that you really want to do very much that your parents won't let you do it?

Permissive Parenting Style

- My parents expect me to do chores at home which are my job to do (False)
- My parents expect me to keep my room tidy enough for them (False)
- My parents expect me not to go to pubs (False)
- Some parents are very strict, and others give lots of freedom. What about yours? (Tick one of the 7 boxes below- from "Very strict" to "Very free")[5]
- When you go out with friends your own age how often do your parents ask you?[6]
  - Who you are going out with?
  - Where you are going?
  - What you are going to be doing?
- I smoke at home everywhere

Because b & s can manifest themselves in myriad ways, the preferred PS is the one best suited to capture this kaleidoscopic richness. To sort this one out, it proved advantageous to introduce one more concept, namely that of "Symmetry in Interests".

2.3 Symmetry In Interests

The BCS provides data to buttress the claim that democratic PS is the most suitable PS to complement IC. At age 16, CMs' mothers were queried on "Do you think the following

5. The range between "Very strict" to Neutral was used to inform on Autocratic PS. Likewise, the range from Neutral to "Very free" was used to form Permissive PS. The other part of the range was given the same value as that for Neutral.

6. These are stand-alone items.

should be taught to teenagers at school?" This was followed with 49 enumerated, Likert-scaled items which the mothers answered. In addition, the mothers were asked to rank in order of importance (i.e., what she deemed as most important) the top three interests among the first 25 items, and then subsequently her top three interests among the last 24. An independent and separate self-report queried CMs to provide Likert-scaled replies to how interesting they find each of these 49 items (see Appendix D for the actual BCS presentation of this self-report question to CMs), listed below.

Interest Questions
How interested are you in:

1. How the body works
2. Staying well
3. Immunisation
4. Illness and recovery
5. Talking with Doctors, Nurses and Dentists
6. Care of hair, teeth, skin
7. Care of eyes
8. Care of feet
9. Human reproduction
10. Menstruation (periods)
11. Food and Health
12. Drinking alcohol
13. Glue-sniffing
14. Smoking
15. Physical fitness
16. Understanding the needs of handicapped people
17. Understanding the needs of old people

18. Health and social services
19. Safety at home
20. Safety in traffic
21. Water safety
22. First aid
23. Family life
24. Separation from parents
25. Death and bereavement
26. Stress and relaxation
27. The difference between boys' behaviour and girls' behaviour
28. Normal growth and development
29. Relationships with other boys and girls of the same age
30. Understanding people of different race or religion
31. Feelings (love, hate, anger, jealousy)
32. Bullying
33. Building self-confidence
34. Making decisions
35. Honesty
36. Responsibility for your own behaviour
37. Spare-time activities
38. Boredom
39. Caring for pets
40. Vandalism
41. Stealing
42. Pollution
43. Conservation

44. Contraception
45. Parenthood and child care
46. Sexually transmitted diseases
47. Control of body weight
48. Violence on the television screen
49. Cancer

We reason that the 16 year old CMs are fully aware about their mothers' likes and dislikes—and especially what their mothers like the most and to what degree. This idea is being conceptualized into the symmetry in interests (SII) measure, i.e, how much the child agrees/disagrees with what their mother considered as most important. Within the constraints of the BCS data, Symmetry In Interests was the closest to what we were able to come up with to assess the relationship between a mother and her 16 year old child. Though this thesis uses SII only in Appendix D, we felt it is of value to fellow researchers to know that such a mother-child relationship measure exists in the BCS data.

The highest interest item flagged by mother is given a weight of 3, the second highest a weight of 2, and the third highest a weight of 1. This is done for the first 25 items and then this process is repeated for the last 24 items. If a child is either very interested or quite interested in the item, we add the mother's weight. On the other hand if the child is not interested at all or not sure, we add the negative of mother's weight for that item. Summing over the first and second set of 3 items each—determines the SII value. At least one of mother's important items must have been ranked by her child (i.e., the child did not leave the responses blank to all of mother's important items) for SII to be non-missing. In other words, if there is zero overlap between mother's items she deemed important and her child's responses then a missing value is given to that mother-child dyad.

The range for SII is then between -12 to 12, with -12 expressing extreme opposing views between mother and child and +12 conveying complete alignment in interests. SII assesses

the relationship between mother and her child (i.e., CM). For robustness checks, the SII_eq measure was created where unit weights are given for each of the 6 items deemed important by mother. This measure is called SII_eq (equal weights) to distinguish it from SII.

This completes the introduction of our concepts. The remainder of this Chapter will be devoted to review the relevant concepts that either BGHH or BCS already created.

2.4 IQ and Personality Traits

This thesis adopts BGHH conceptualizations for IQ and personality traits. Using the BCS data, BGHH constructed a measure of IQ from a cognitive skills test when CMs were 10 year old. The personality traits were measured from items that were answered by the 10 year old CMs and from other responses given by their teachers during the same sweep. Please see Borghans et al. (2016) and especially their supplementary information therein.

2.5 BCS Measures

2.5.1 WEMWB

The well-being score used by BCS is a well established entity. Tennant et al. (2007) argue that poor mental health instruments, often by construction, have limited reach in assessing well-being (WB). To overcome these limitations, they developed WB scales to focus wholly on the positive so as to be free of ceiling effects in population studies and to support mental health promotion. These efforts resulted in the Warwick Edinburgh Mental Well Being Scale (WEMWB). The authors claim their measure is valid, reliable, and has lower (or similar) social desirability bias than other comparable scales used prior to 2007. The scale is designed to represent the respondent's mental well-being. It is calculated as a sum of the 14 question responses detailed below—each item on a 5-valued Likert scale. This thesis uses

the WEMWB scale along with various versions of a Malaise Distress Scale as some of its' key mental health outcomes.

Warwick-Edinburgh Mental Well Being (WEMWB) Scale

- In the past 2 weeks, how often have you (the Cohort Member)...
  - been feeling optimistic about the future
  - been feeling useful
  - been feeling relaxed
  - been feeling interested in other people
  - had energy to spare
  - been dealing with problems well
  - been thinking clearly
  - been feeling good about myself
  - been feeling close to other people
  - been feeling confident
  - been able to make up my own mind about things
  - been feeling loved
  - been interested in new things
  - been feeling cheerful

2.5.2 Emotional Well-Being

Similarly, emotional WB is obtained from 5 questions—each on a 6-point Likert scale ranging from "All of the time" to "None of the time"—consisting of:

Emotional Well-Being

- How much time during the past 4 weeks...
  - have you been a very nervous person?
  - have you felt so down in the dumps nothing could cheer you up?
  - have you felt calm and cheerful?
  - have you felt downhearted and low?
  - have you been a happy person?

2.5.3 Malaise

The Malaise score is a self-reported measure of mental distress made up of 24 questions, listed below. All 24 questions were used in assessing maternal malaise on three occasions when CMs were 5, 10, 16 years old. There were slight variations in the way these questions were Likert-scaled. When CMs were 5, these were simple yes-no questions. At age 16, there were three categories, (0) rarely or never, (1) some of the time, (2) most of the time. At age 10, mothers were asked to report on a sliding scale between 0 (seldom or never) to 100 (most of the time)—in other words, mothers had to draw a vertical line through the printed horizontal line to show how much a question applied (or not) to them.

CMs' malaise scores were obtained as follows. At age 16, the last two questions marked with a * were omitted (see the list below). The sweeps at ages 26 and 30 saw the full-blown 24 questions, whereas the later sweeps, ages 34, 42, 46, saw only the reduced number of 9 items marked with a †. The yes/no 2-valued Likert format was used for all CMs' self-report malaise items, except at age 16 where the 3-valued Likert format was used. No malaise score was assessed at age 38.

Malaise Questions (Various Sweeps)

1. Do you often have backache?
2. Do you feel tired most of the time?†
3. Do you often feel depressed?†
4. Do you often have bad headaches?
5. Do you often get worried about things?†
6. Do you usually have great difficulty in falling or staying asleep?
7. Do you usually wake unnecessarily early in the morning?

8. Do you wear yourself out worrying about your health?
9. Do you often get into a violent rage?†
10. Do people annoy and irritate you?
11. Have you at times had a twitching of the face, head, or shoulders?
12. Do you suddenly become scared for no good reason?†
13. Are you scared to be alone when there are no friends near you?
14. Are you easily upset or irritated?†
15. Are you frightened of going out alone or of meeting people?
16. Are you constantly keyed up and jittery?†
17. Do you suffer from indigestion?
18. Do you suffer from an upset stomach?
19. Is your appetite poor?
20. Does every little thing get on your nerves and wear you out?†
21. Does your heart often race like mad?†
22. Do you often have bad pain in eyes?
23. Are you troubled with rheumatism or fibrosis?*
24. Have you ever had a nervous breakdown?*

2.5.4 Additional Adult Outcomes

The other adult outcomes of interest are mostly drawn from the 2016 BCS wave and discussed further in Appendix C. They fall under one of the following categories:

- Further measures of well-being
- Satisfaction with life, job, relationship
- Social Life
- Health
- Education/Income

2.6 Attrition Bias

Many central childhood concepts are constructed from data collected in 1986, the 16-year-old BCS sweep. In 1986 teachers were striking in the U.K.—giving rise to concerns about systematic biases. We consulted extensively with BCS professionals on these issues and in how to best handle missing data more generally. The Missing Data Team is planning to publish the "BCS70 Missing Data Guide" in September, 2021. The consensus among BCS professionals is that the teachers's strike in 1986 is not related to any of the cohort member's characteristics and that missingness due to the strike can be thought of as MCAR (Missing Completely at Random).[7]

7. Brian Dodgeon (Research Fellow, Centre for Longitudinal Studies, UCL) private communication, May 18, 2021: "On the issue of correcting for the teacher's strike at age 16, it's best to use the NCDS paper to help with the general approach to missingness. The general view is that the strike is not related to any of the cohort member's characteristics (except region of residence, but this is available in previous sweeps and can be used in Multiple Imputation). So, missingness due to the strike can be thought of as MCAR (Missing Completely at Random)."

CHAPTER 3

RESULTS

Borghans, Golsteyn, Heckman, and Humphries (2016) [BGHH] used BCS and other longitudinal data sets to show that personality traits matter for lifetime outcomes beyond—the traditionally viewed as important—cognitive skills. This thesis follows in the mold of BGHH and shows in analogous fashion that IC is another important factor in predicting adult outcomes. The implications of the findings below, however, are limited by the constraints of the data. While this evidence is highly suggestive of strong links between IC and many important adult outcomes, the analysis presented below (and similarly, that of BGHH) does not identify causal relationships.[1]

On the way of demonstrating that IC matters, the thesis describes the vast richness inherent in the BCS data, in both childhood and adult measures and in the linkages between them. First, we expand the set of outcomes of interest (compared to BGHH) with the many varied and robust lifetime measures provided by BCS. Second, the detailed childhood BCS questionnaires allowed us to create several versions of each measure of interest (e.g., IC) at different stages in the lives of CMs and from different perspectives. These various measures are then used extensively for robustness checks.

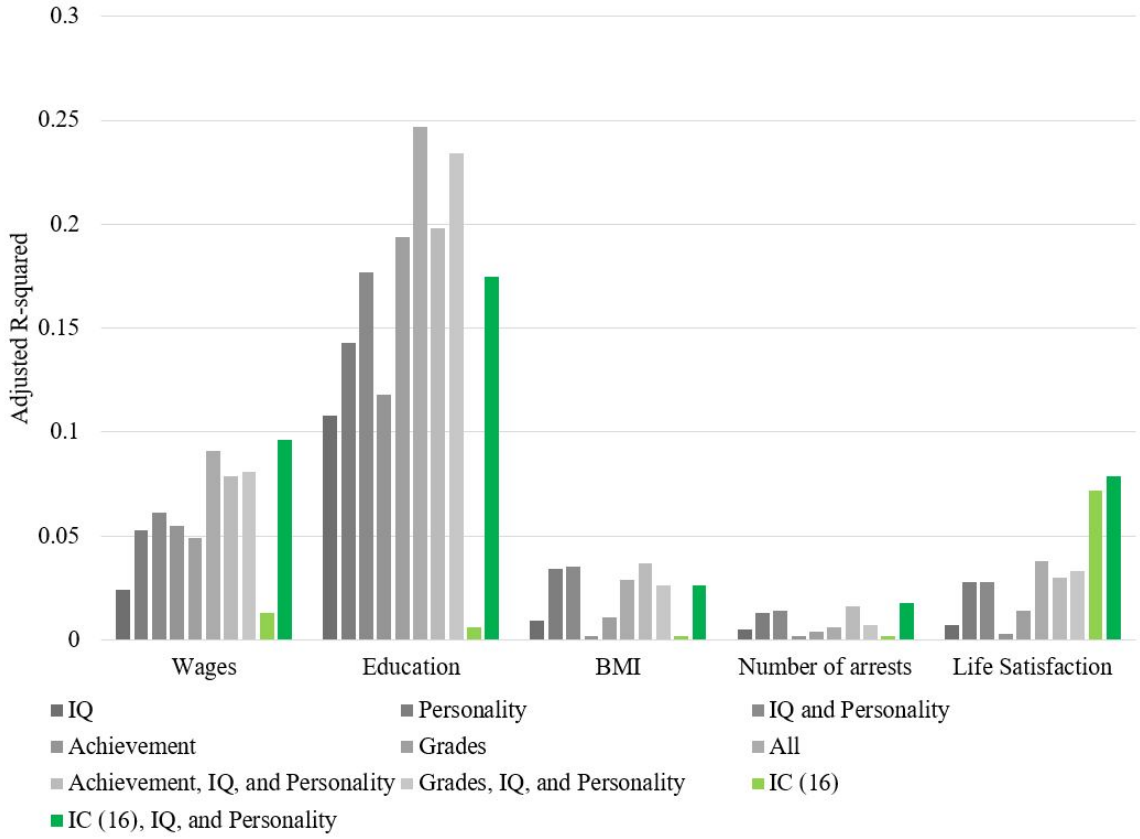
Gray bars in Figure 3.1 replicate results from Figure 4 in BGHH,[2] while green bars build on their analysis by adding IC as a regressor. Bars denote the adjusted R-squared from running regressions where outcomes are listed under each set of bars and regressors are denoted via the color-coded labels. Figure 3.1 shows that IC only performs better than BGHH's regressors when it comes to predicting Life Satisfaction. This finding motivated

1. I use the evidence set forth in this thesis as a strong motivator for my forthcoming RCTs on teacher interventions and children outcomes.

2. To accurately reproduce Figures 3.1 and 3.8, Borghans et al. (2016)'s definitions of educational attainment, IQ, personality traits, grades, achievements were followed to a tee. Except for Figures 3.1 and 3.8, measures of educational attainment and grades were adjusted to incorporate advice by BCS professionals and British educators.

us to expand the set of outcomes, beyond traditional measures of life accomplishments, to important measures of physical and mental health, several subjective well-being measures, and varied educational and labor outcomes.

Figure 3.1: Borghans et al. (2016) Figure 4 + Intrinsic Capital at Age 16



Gray bars replicate Table 4 in Borghans et al. (2016), which display the adjusted R-squared obtained from running Equation (2.1). Outcomes are listed under each set of graphs and regressors are color-coded according to the labels. Green bars are versions of Equation (2.1) but introducing IC as the regressor of interest. Wages were measured at age 38, all other plotted outcome measures at age 34.

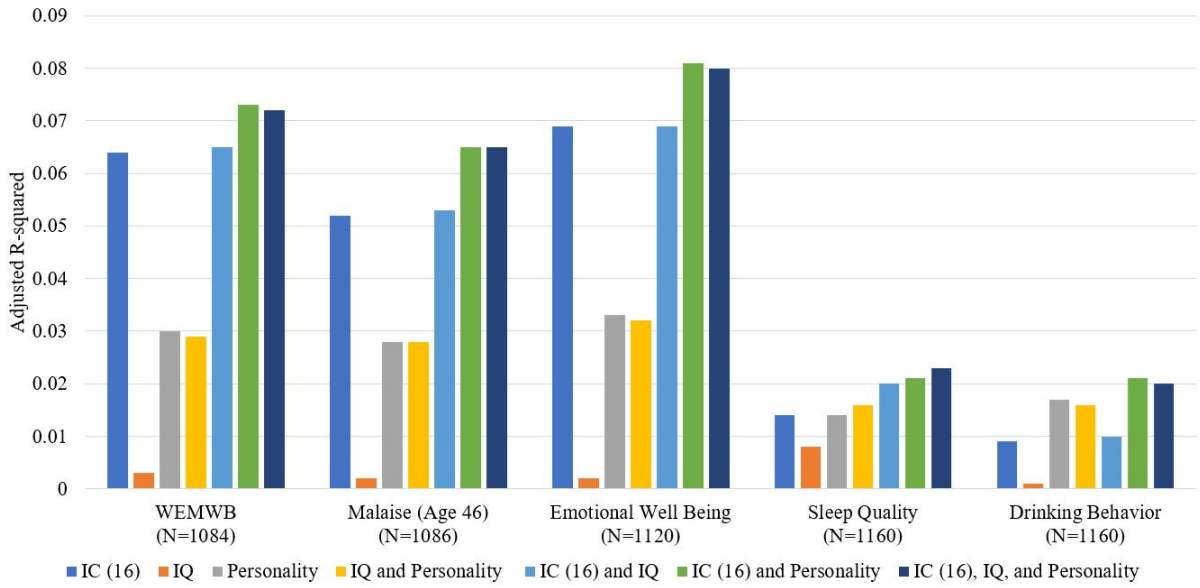
In the next sections, we expand the analysis of BGHH. First, we show that IC has varying predictive power for non-traditional, subjective life outcomes, such as physical and mental health, several subjective well-being measures, and various educational and labor outcomes. Then we move from the IC domain to consider a complementary measure of belonging and significance, parenting style (PS). We present the same analysis using PS as the regressor of

interest and show that while PS has attenuated predictive power compared to IC, it is still relevant. Further, we exploit the richness of the BCS data to analyze the roles of different perspectives (e.g., parents, teachers). Additionally, this abundance of data allows us to conduct analyses where the outcomes and regressors are both childhood measures to explore differences between contemporaneous and asynchronous measures and the importance of context. Lastly, we explore the robustness of these analyses to other statistical methods, i.e., an Analysis of Variance (ANOVA).

3.1 Intrinsic Capital

Figure 3.2 and 3.3 show the remarkable predictive power of IC on a set of well-being and mental health measures. Both figures show a stark independent power of IC in predicting these outcomes, compared to the traditional regressors used in Borghans et al. (2016). This is particularly salient for the first 3 outcomes in Figure 3.2, where the first blue bar, which denotes the outcomes regressed on IC alone provides almost all of the predictive power obtained from the set of regressors studied. This result is not as stark in the last two outcomes of this Figure. One key difference between the first three outcomes (WEMWB, Malaise, and Emotional Well Being) and the last two outcomes (Sleep Quality and Drinking Behavior) is that the former can be described as more subjective, idiosyncratic to the CM while the latter set of outcomes is perhaps easier to quantify and more objective. Surveys have found that the U.K. population answers these factual questions accurately (Sabia et al., 2021). This consistent finding demonstrates that the results observed with Life Satisfaction in Figure 3.1 are robust and part of a larger pattern.

Figure 3.2: Intrinsic Capital at Age 16 on Well Being Outcomes at Age 46

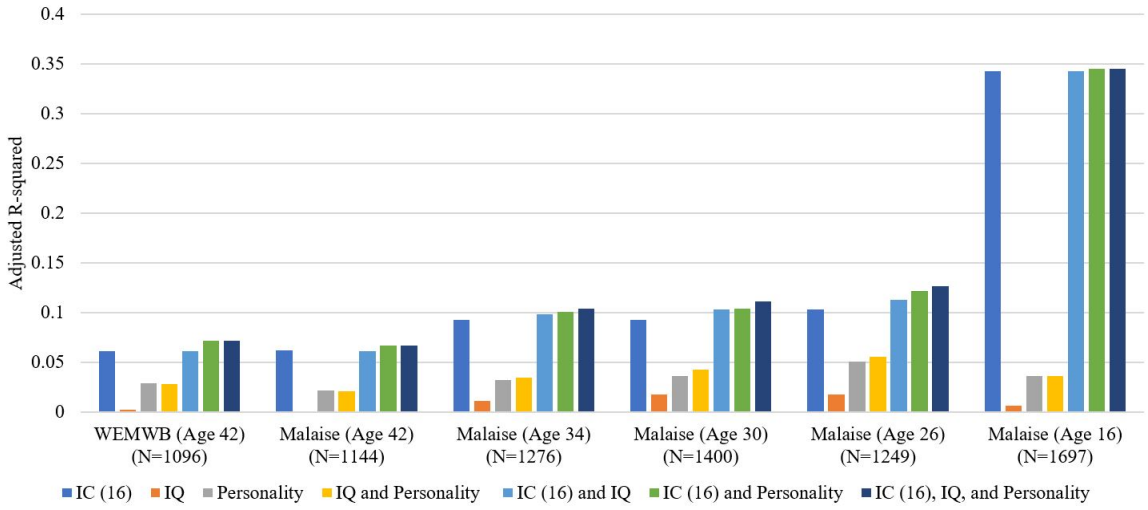


Bars display the adjusted R-squared from different versions of Equation (2.1), where outcomes and number of observations are listed under each set of bars and color-coded labels denote regressors.

In Figure 3.3, we explore further the dominance of IC on one key outcome of interest, Malaise. As one would expect, the strongest effect is observed for the Malaise (16) outcome, likely because it is contemporaneous to the main regressor, IC (16). This large effect fades out with time, as CMs grow older, but the trend is remarkably consistent. IC (16) is the strongest predictor of Malaise scores of CMs through life, out of all regressors considered, including those of BGHH.

In consequence, this is evidence that IC has much higher predictive power, in space (across variations along the same measure) and time (same measure at different time points), on subjective life outcomes compared to traditional measures of cognitive and non-cognitive skills. This results suggests that IC brings in new additional and independent information. Additionally, IC and personality jointly deliver higher predictive power to these subjective outcomes, which illustrates again the independent contribution of IC to the predictive power of these outcomes.

Figure 3.3: Intrinsic Capital at Age 16 on Malaise Outcomes and Well Being Outcome at Age 42

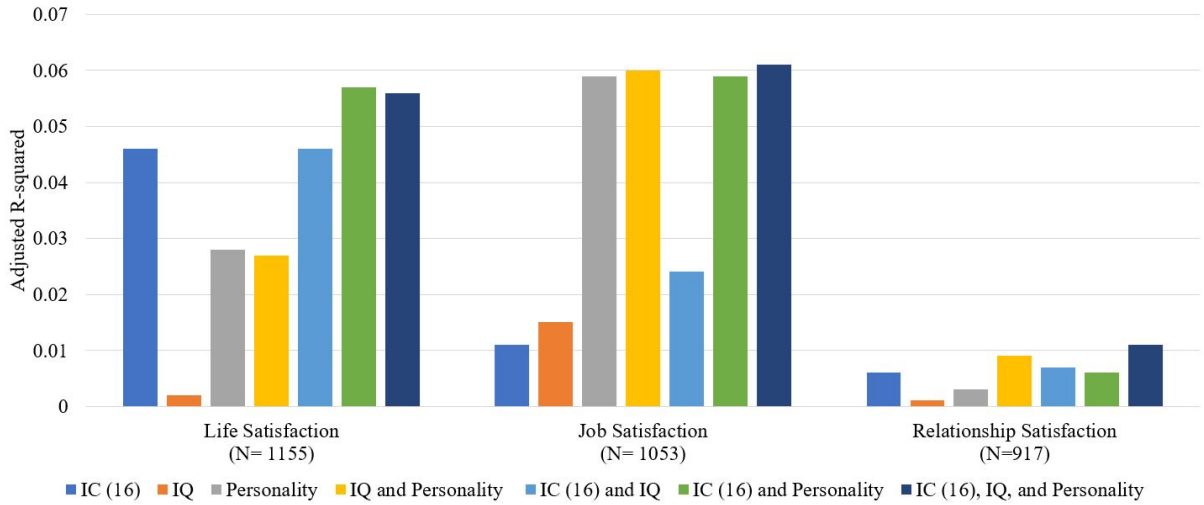


Bars display the adjusted R-squared from different versions of Equation (2.1), where outcomes and number of observations are listed under each set of bars and color-coded labels denote regressors.

Figure 3.4 shows results of regressing various satisfaction measures(46) on IC and traditional cognitive and non-cognitive factors. Job satisfaction and relationship satisfaction are interesting. On the one hand they are subjective outcomes, yet on the other hand they contain "reality checks" which are absent in the more pure subjective measures. In other words, the CM must be in a relationship or working at a job to answer these questions. As such the CM is not altogether free to fantasize, day dream or delude themselves without bounds. His subjectivity is constrained by having to consider another—be it a partner or a boss/coworker—perception. These considerations may be partially responsible for the observed reduction in importance of subjective IC when regressing either "current Job Satisfaction(46)"[3] or Relationship Satisfaction (46) on IC.

3. Job Satisfaction plotted in Figure 3.4 is the latent factor score from a factor analysis comprised mainly of more objective items with "Satisfaction with current job" a more subjective item, see Appendix C. Job satisfaction is therefore even more heavily tilted towards objective standards than "current Job Satisfaction(46)".

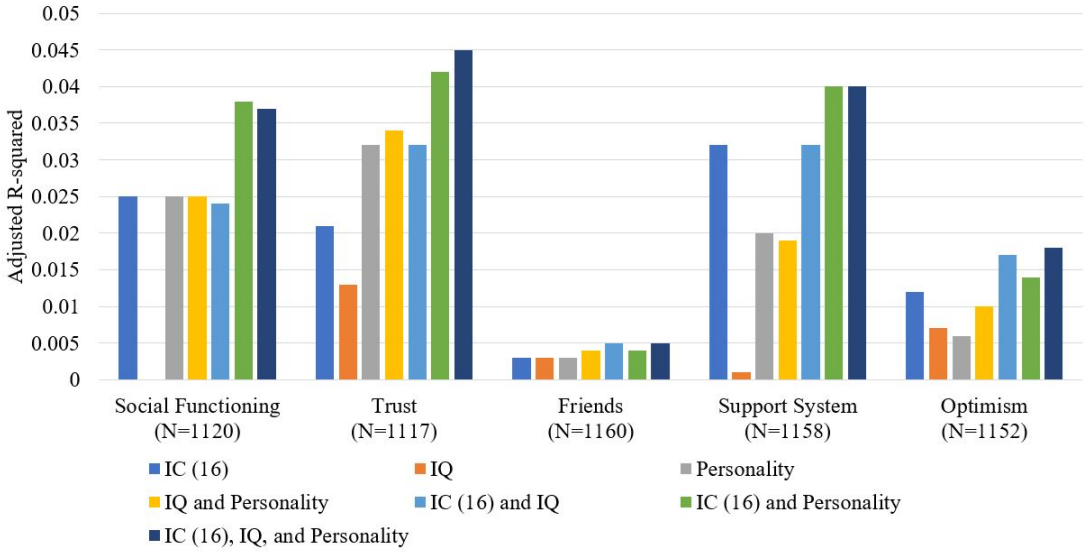
Figure 3.4: Intrinsic Capital at Age 16 on Satisfaction Outcomes at Age 46



Bars display the adjusted R-squared from different versions of Equation (2.1), where outcomes and number of observations are listed under each set of bars and color-coded labels denote regressors.

These "reality checks" manifest as "social constraints" and may explain similar observations when social outcomes are investigated, see Figure 3.5. Social functioning, friends, support system, and trust are partly subjective but also injected with a modicum of "social constraints"—of having to consider others' perceptions. Figure 3.5 shows that, while not as strong as the effects we have observed for well-being and mental health outcomes, IC is an important predictor of social outcomes. In particular, IC has independent, strong predictive power for Support System, Social Functioning, and Trust, all concepts with a high other-regarding component.

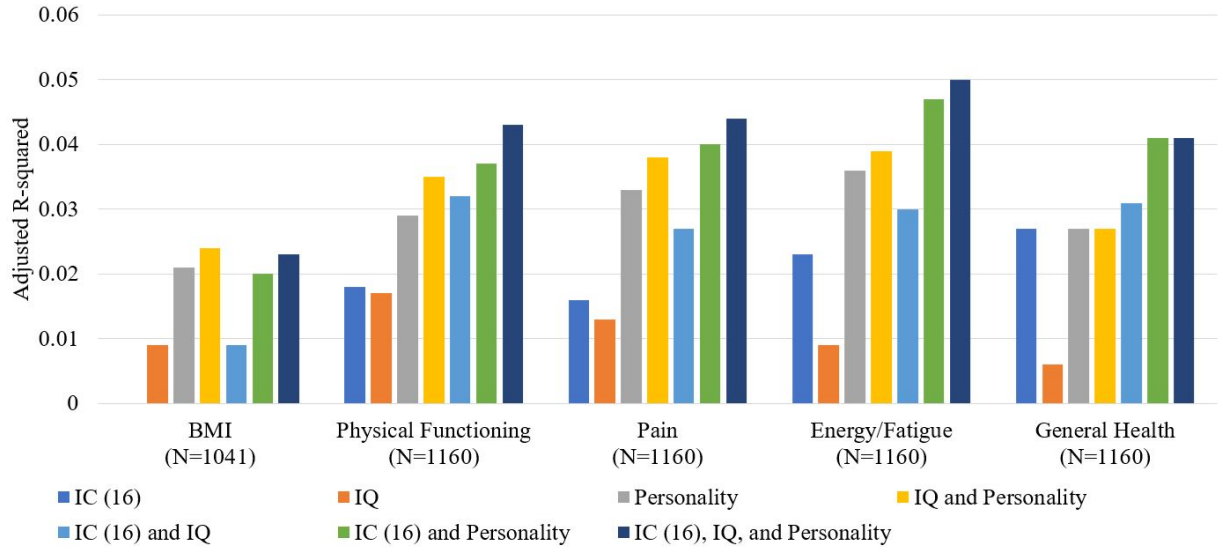
Figure 3.5: Intrinsic Capital at Age 16 on Social Outcomes at Age 46



Bars display the adjusted R-squared from different versions of Equation (2.1), where outcomes and number of observations are listed under each set of bars and color-coded labels denote regressors.

Figure 3.6 shows the results for physical health measures. There are a few takeaways from this set of outcomes. First, and in line with the results we have devised up to now, IC is not predictive of the objective (measured by a nurse) measure of BMI. Second, IC adds independent predictive power to the BCS measure of General Health, suggesting that IC does matter for physical health. However, when looking at physical health in specific outcomes (pain, physical functioning and energy/fatigue), IC is hardly the strongest predictor. While IC does still bring in independent information, the effect of IC does not stand out greatly from that of personality traits and IQ.

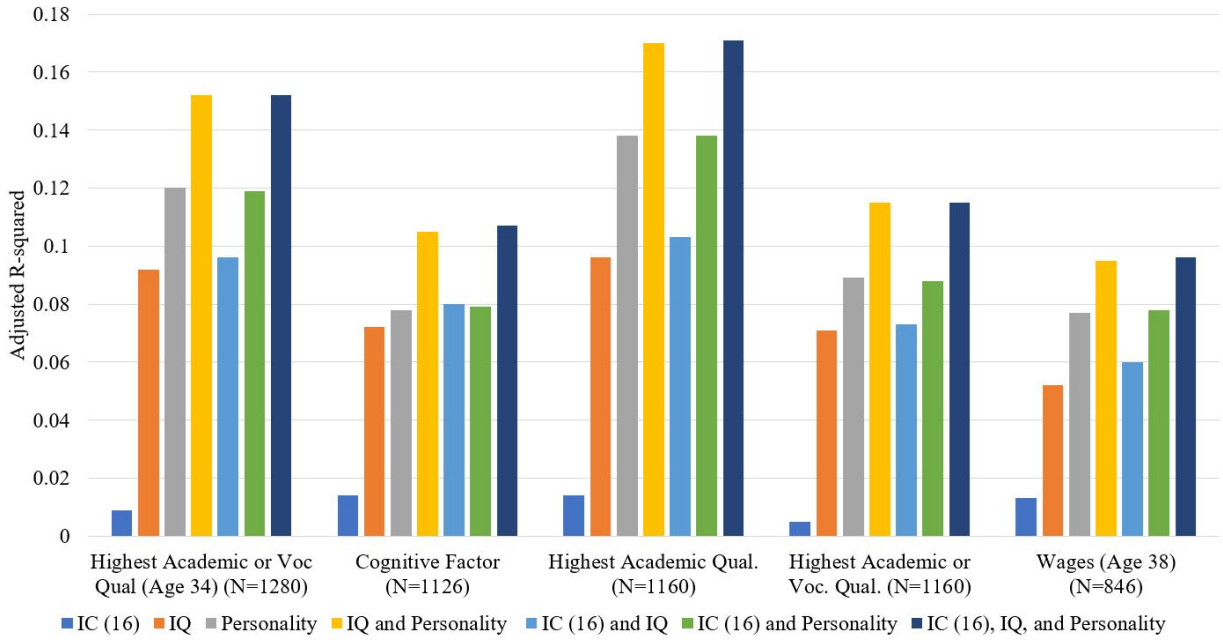
Figure 3.6: Intrinsic Capital at Age 16 on Physical Health Outcomes at Age 46



Bars display the adjusted R-squared from different versions of Equation (2.1), where outcomes and number of observations are listed under each set of bars and color-coded labels denote regressors.

Finally, Figure 3.7 shows that IC does neither matter much to Educational Achievements (46), Wage (38) nor to Cognitive Faculties (46). However, further studies are warranted because of some puzzling facts. First, Walton and Cohen (2011) and Walton and Wilson (2018) show that developing a deeper sense of belonging increases academic achievements and college completion rates in minority students—findings that have been reproduced in high school settings (Williams et al., 2020). Combining these findings with those of Bukodi et al. (2019) suggests that CMs believe that they must stay in their social/educational lanes. Bukodi et al. (2019) bring tantalizing evidence for such an interpretation using the same BCS data. They find that even the high achievers in cognitive measures in childhood when they come from disadvantaged social class were found to advance career-wise mainly through vocational upgrade-training and not through academic upgrade-training. In contrast, their more privileged CMs, who had lower cognitive scores in childhood, upgrade their skill sets mainly through academic improvements.

Figure 3.7: Intrinsic Capital at Age 16 on Educational and Labor Outcomes



Bars display the adjusted R-squared from different versions of Equation (2.1), where outcomes and number of observations are listed under each set of bars and color-coded labels denote regressors. Outcome measures at age 46, unless explicitly stated otherwise.

In sum, how individuals perceive their place in the world matters a great deal when studying their subsequent mental health, well-being, and life satisfaction. This is of great import because of the staggering economic costs of poor mental health. IC matters—albeit not as dominantly as for the mental health outcomes–for lifetime outcomes which involve social feedback either via a partner, boss, or social connections. Probably, a pure IC effect is attenuated by "reality checks/social constraints", such as peer pressure, social norms, etc. Taken at face-value it appears that IC does not matter much for Educational Attainment or Wages/Income. However, Bukodi et al. caution that this may reflect generational stickiness in social class. CMs may not imagine themselves in different social/educational lanes—limiting their sense of belonging and significance.

3.2 Parenting

"When I was a boy of 14, my father was so ignorant I could hardly stand to have the old man around. But when I got to be 21, I was astonished at how much the old man had learned in seven years." (attributed to Mark Twain)

The BCS data is so rich and bountiful that it was possible to construct not only measures of generic IC, but also domain-specific IC (i.e., home and school domains). Moreover, such a complex concept can be further enriched by subjective information from the children's perspectives. On that note, we consider an additional, complementary measure of children's sense of belonging and significance, parenting styles as seen through the eyes of children.

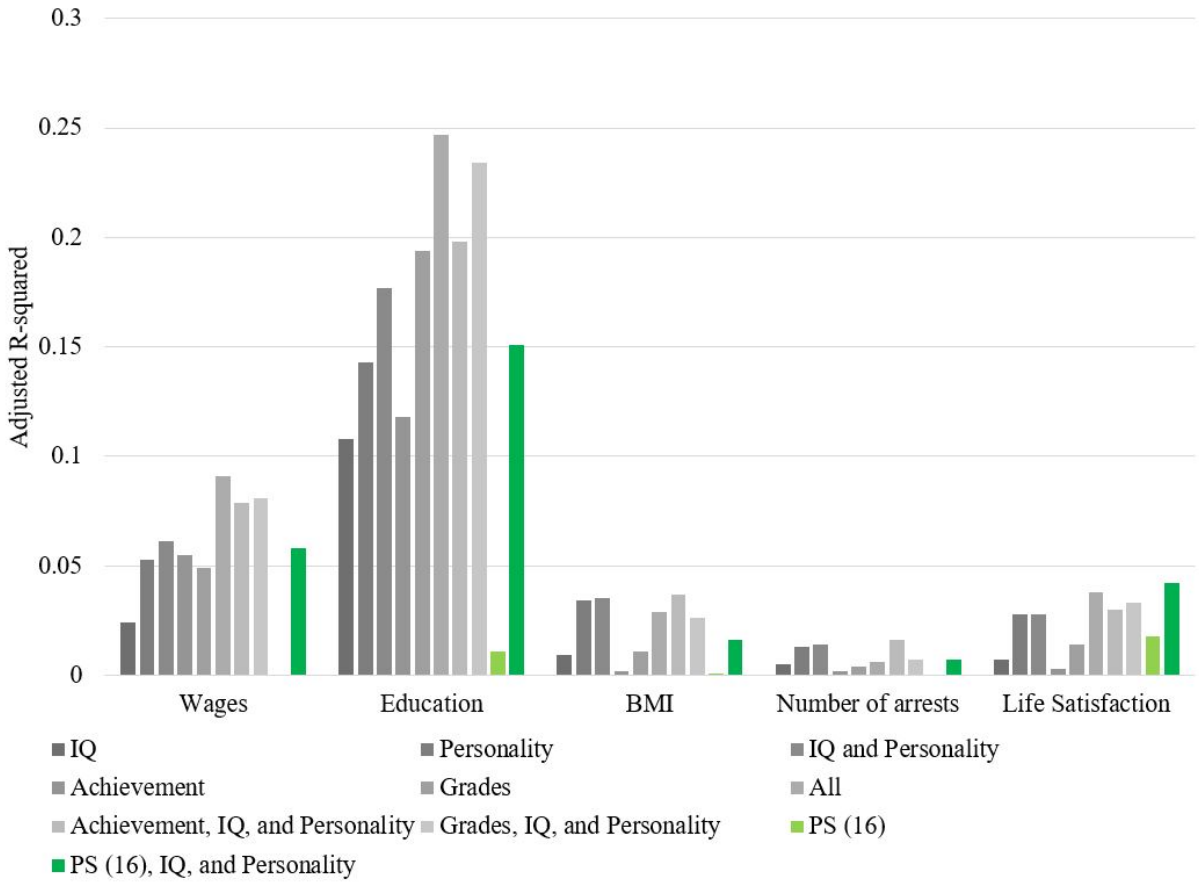
At age 16, the extensive self-reports of CMs enabled us to construct autocratic, democratic, and permissive parenting styles as explained in the Data Chapter and in line with the literature. However, in the analyses that follow, we use the democratic PS as the regressor of interest. Our thinking for this choice is manifold. First, while the data for both autocratic and democratic PSs are robust, we posit that a high score for democratic PS shows that the CM feels validated and heard by their parents, thereby touching upon their idiosyncratic sense of belonging and significance. In contrast, an intense autocratic PS reveals that the child (i.e., CM) views their parent as demanding its' obedience—with no tolerance for dissent. While information would be gained on a child's sense of belonging and significance under an autocratic regime, we are interested in studying the myriad manifestations of IC possible, and not only IC generated under dictatorial circumstances. Appendix D provides evidence for this point of view arising directly from the BCS data.

Likewise, a child experiencing a permissive parenting style is invited to believe that anything goes. The lack of engagement of parents in their children's lives may give the child a convoluted sense of b & s in settings without any limits and boundaries. However, we are not interested in studying b & s under such limitations. Permissive and autocratic parenting styles do not provide the largest possible complementary insights on the sense of belonging

and significance of children. For these reasons, we believe democratic PS is a more insightful measure, hence we use Democratic PS in all analyses that follow—except when explicitly stated otherwise.

In the following discussion, instead of using IC as the key regressor of interest, Figure 3.8 replicates Borghans et al. (2016) and shows results when outcomes are regressed on PS. Results are similar to those obtained in Figure 3.1.

Figure 3.8: Borghans et al. (2016) Figure 4 + Parenting Style at Age 16

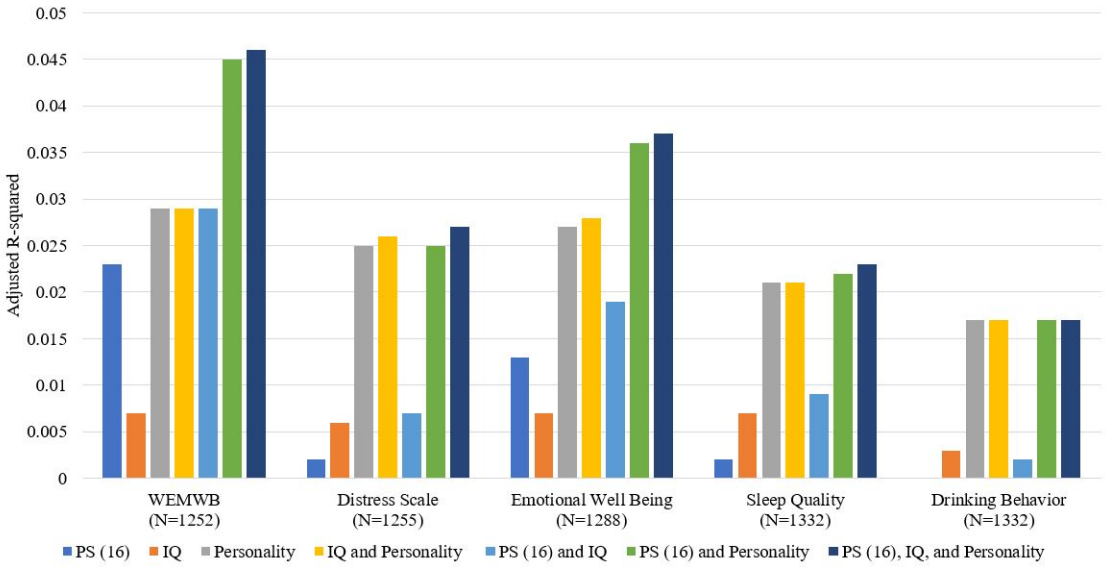


Gray bars replicate Table 4 in Borghans et al. (2016), which display the adjusted R-squared obtained from running Equation (2.1). Outcomes are listed under each set of graphs and regressors are color-coded according to the labels. Green bars are versions of Equation (2.1) but introducing PS as the regressor of interest. Wages were measured at age 38, all other plotted outcome measures at age 34.

PS, as a probe into belonging and significance, holds less predictive power on well-being

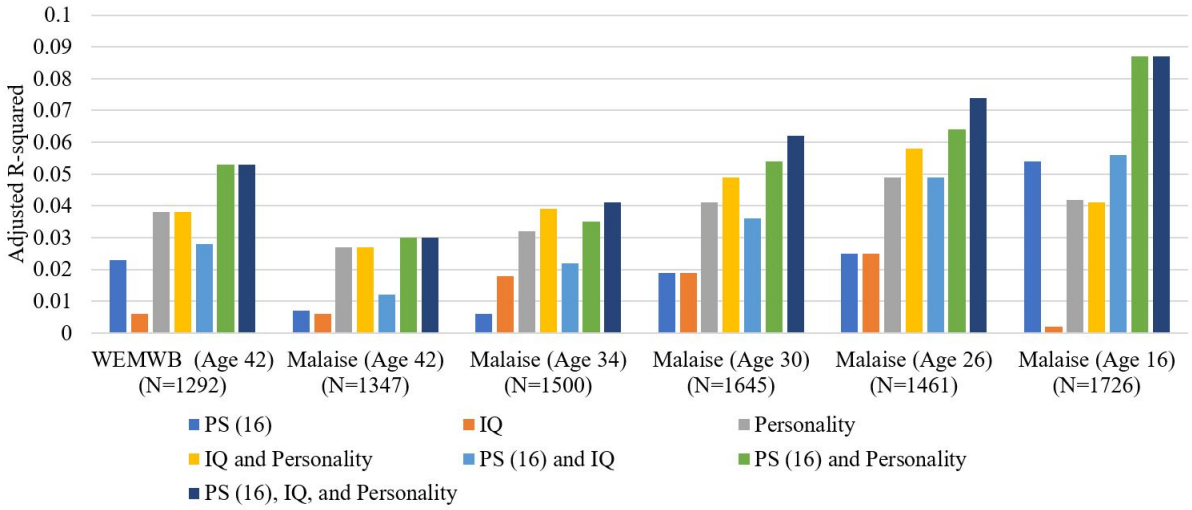
and mental health outcomes than IC showed in the last section. As Figures 3.9 and 3.10 display, PS is important, especially for outcomes such as WEMWB and Malaise(16). However, PS is hardly the dominant predictor of the set of outcomes presented in these figures. Surprisingly, there is a stark decrease in predictive power of Malaise(46) when moving from IC to PS. This peculiarity will be explored in the next Section. Perhaps intuitively, we also find that the fade-out effect documented in Figure 3.3 is much more pronounced in Figure 3.10; the predictive power of PS disappears rapidly after age 16, as the teenagers' viewpoints on their parents wane and the mature adults' (same CMs!) viewpoints on their parents ascend as they become independent adults.

Figure 3.9: Parenting Style at Age 16 on Well Being Outcomes at Age 46



Bars display the adjusted R-squared from different versions of Equation (2.1), where outcomes and number of observations are listed under each set of bars and color-coded labels denote regressors.

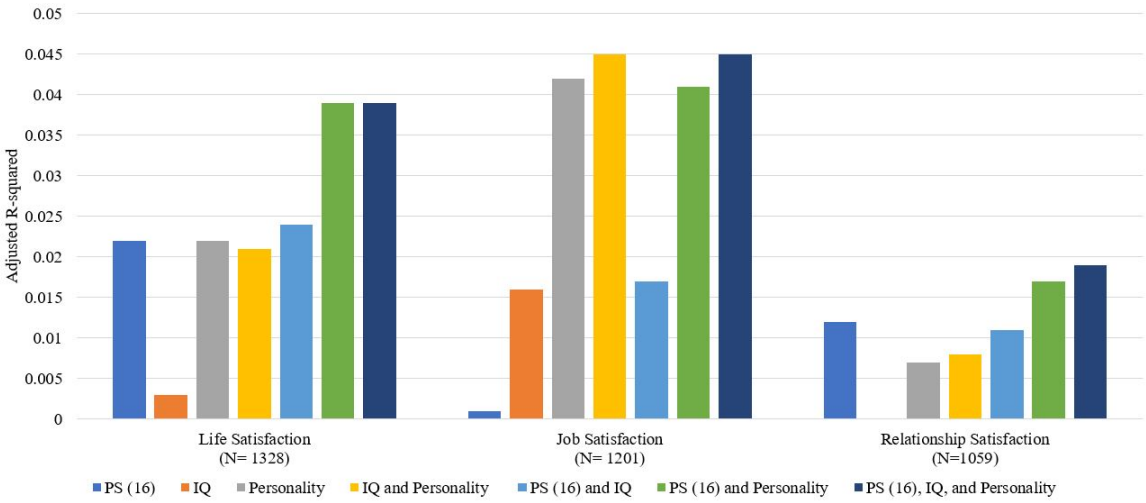
Figure 3.10: Parenting Style at Age 16 on Malaise Outcomes and Well Being Outcome at Age 42



Bars display the adjusted R-squared from different versions of Equation (2.1), where outcomes and number of observations are listed under each set of bars and color-coded labels denote regressors.

The pattern observed with WB and Life Satisfaction (34) is largely repeated with Life Satisfaction(46), see Figure 3.11. When it comes to job satisfaction and relationship satisfaction, results are mixed. PS is predictive of relationship satisfaction, echoing our finding with IC, but PS is virtually not predictive of job satisfaction.

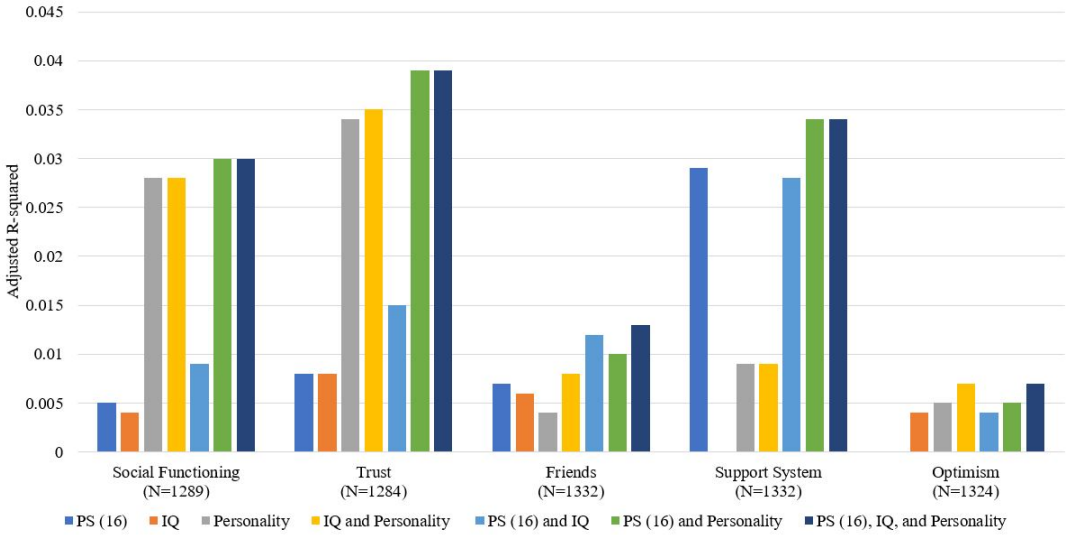
Figure 3.11: Parenting Style at Age 16 on Satisfaction Outcomes at Age 46



Bars display the adjusted R-squared from different versions of Equation (2.1), where outcomes and number of observations are listed under each set of bars and color-coded labels denote regressors.

Figure 3.12 reveals that PS predicts Friends (46) and Support System (46) more in comparison to cognitive and non-cognitive skills, echoing IC results. PS appears to matter much less to Social Functioning (46) and Trust (46), in contradistinction to our earlier findings on IC.

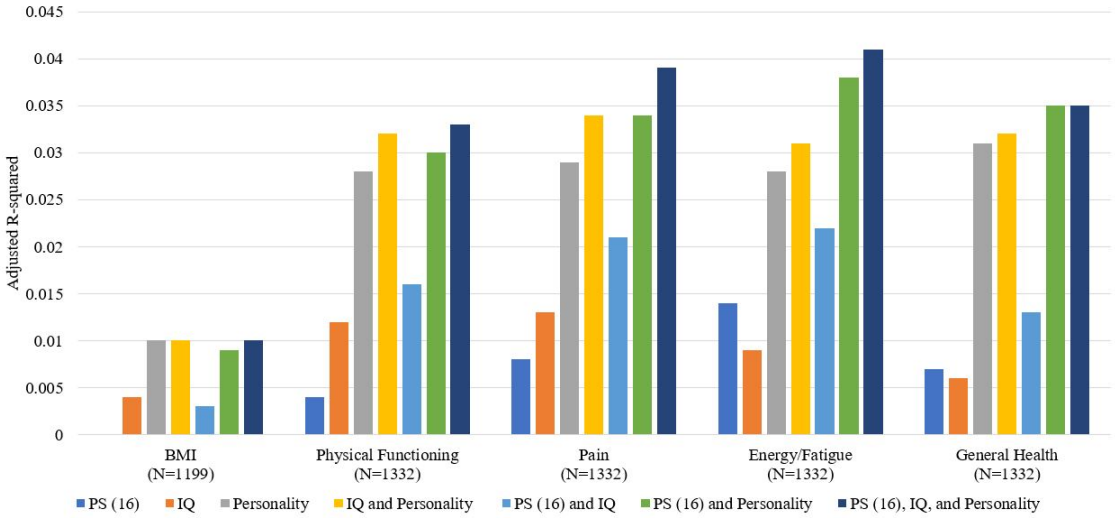
Figure 3.12: Parenting Style at Age 16 on Social Outcomes at Age 46



Bars display the adjusted R-squared from different versions of Equation (2.1), where outcomes and number of observations are listed under each set of bars and color-coded labels denote regressors.

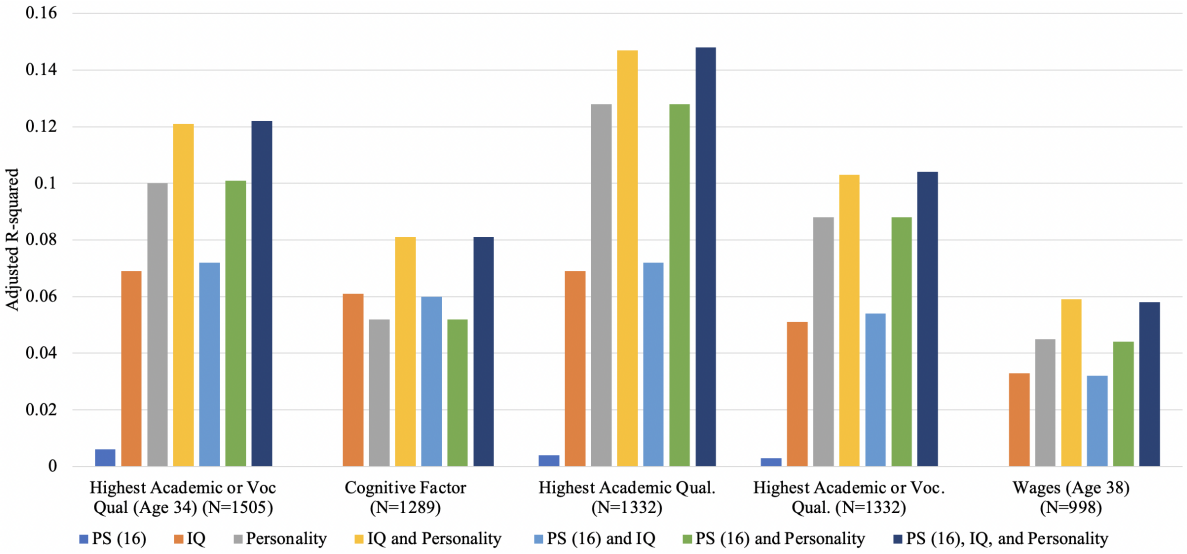
Figure 3.13 looks at health outcomes, where PS matters much less than personality traits, except for the energy/fatigue score which can be thought of as a probe on mental mindset, echoing our earlier findings of WB on PS. Additionally, and in line with the IC results, PS is not predictive of the objective measure of BMI.

Figure 3.13: Parenting Style at Age 16 on Physical Health Outcomes at Age 46



Bars display the adjusted R-squared from different versions of Equation (2.1), where outcomes and number of observations are listed under each set of bars and color-coded labels denote regressors.

Figure 3.14: Parenting Style at Age 16 on Educational and Labor Outcomes

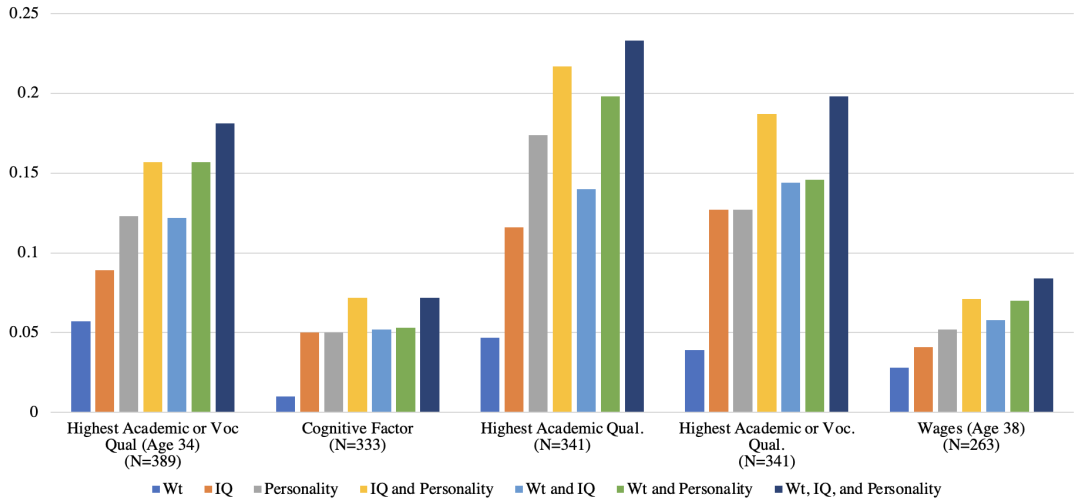


Bars display the adjusted R-squared from different versions of Equation (2.1), where outcomes and number of observations are listed under each set of bars and color-coded labels denote regressors. Outcome measures at age 46, unless explicitly stated otherwise.

In Figure 3.14, we observe that PS is not predictive of neither educational outcomes, wages nor cognitive abilities, all objective measures. This result is counter-intuitive. If

SES were associated with PS, one would expect a strong effect of PS on wages. To further explore this idea, Figure 3.15 shows the adjusted R-squared, where outcomes are regressed on parental income, w_t,[4] as a proxy for SES. Unsurprisingly, parental income matters to Wage(38), yet less than cognitive skills or personality traits. Thus, PS is also not synonymous with SES. Since IC and PS are different lenses into the CMs' subjective worlds, Figure 3.16 shows regressions of WEMWB(46) on IC(16) and PS(16) and their clusters.[5]

Figure 3.15: Educational and Labor Outcomes on Parental Income

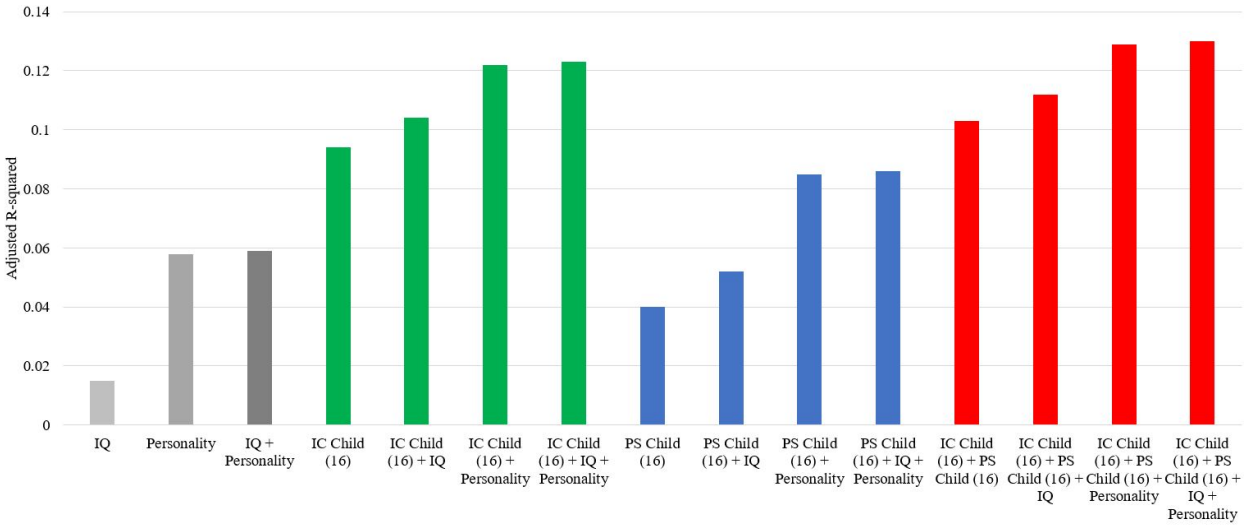


Bars display the adjusted R-squared from different versions of Equation (2.1), where outcomes and number of observations are listed under each set of bars and color-coded labels denote regressors. w_t denotes parental income. Outcome measures at age 46, unless explicitly stated otherwise.

4. At age 10, we have the measure w_t on parental income, described in detail in Chapter 5.

5. By clusters, we mean the set of regressions that we run for a particular regressor. In general, we are interested in comparing a regressor of interest, say X, with IQ, personality, and their combinations. For example, in Figure 3.16, the set of green bars is the cluster of IC(16).

Figure 3.16: Breakdown of Well Being (WEMWB) by IC and PS Measures



Bars display the adjusted R-squared from different versions of Equation (2.1), where the outcome is always WEMWB and the regressors are listed under each bar.

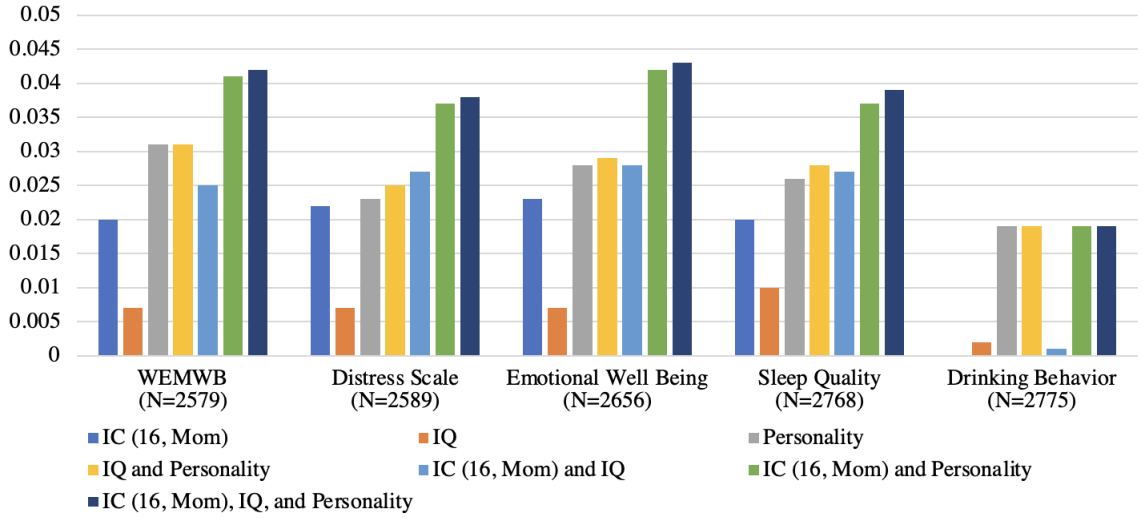
3.3 Perspectives

Section 3.1 demonstrates that IC is highly predictive of subjective adult life outcomes. Do these results hold up when a close, significant adult of the teenage CM (at age 16) were to assess the CM's IC? We explore this idea further in this section. Once again, we exploit the richness of the BCS data to create mother's perspectives on the CM's IC at ages 5, 10, 16. Figure 3.17 replicates Figure 3.2, but using IC(16, mom) as the regressor of interest.[6] As this Figure shows, when compared to CM's own IC(16) the predictive power of even such a close and influential adult such as the CM's mother cannot compete. Similarly, in terms of predictive power for WEMWB(46), shown in Figure 3.19 the CM's perspective IC(16) is much more important than the mother's perspective, IC(16, mom).[7]

6. Figure 3.18 replicates 3.2 with IC(10, mom) as regressor.

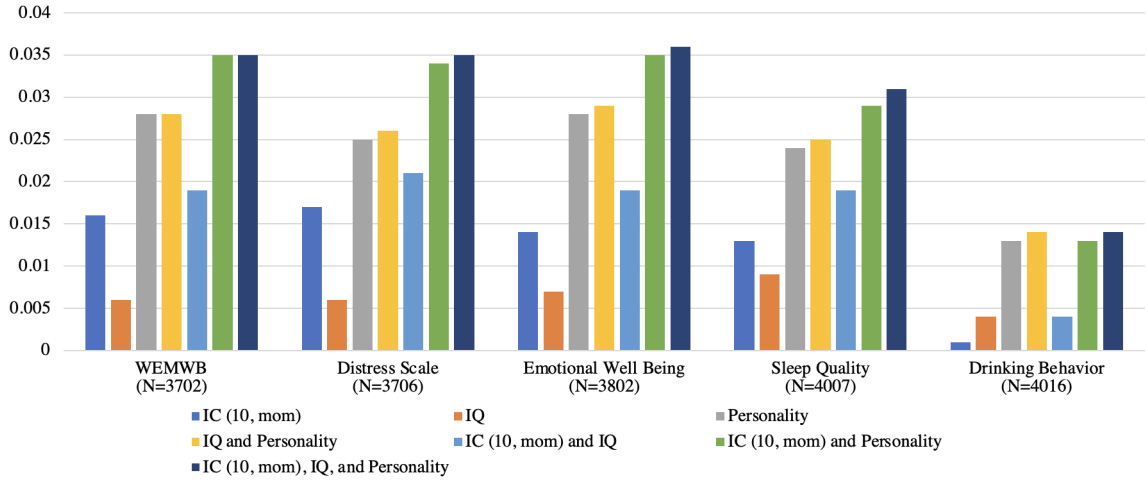
7. The adjusted R-squared differ between Figures 3.19 and 3.17 because the samples differ. The former requires non-missing values for all listed regressors, while the latter allows missing IC(16).

Figure 3.17: IC(16, mom) on Well Being Outcomes at Age 46



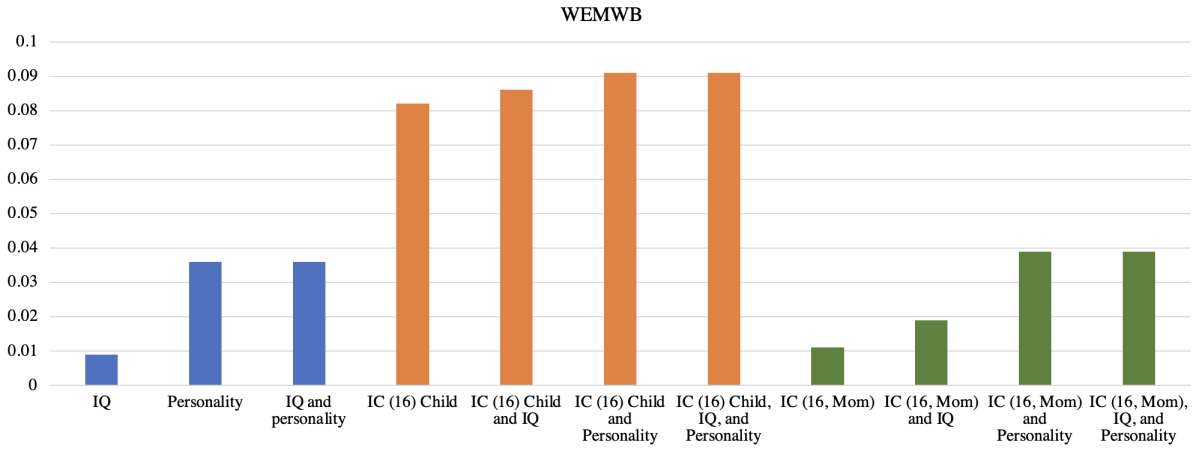
Bars display the adjusted R-squared from different versions of Equation (2.1), where outcomes and number of observations are listed under each set of bars and color-coded labels denote regressors.

Figure 3.18: IC(10, mom) on Well Being Outcomes at Age 46



Bars display the adjusted R-squared from different versions of Equation (2.1), where outcomes and number of observations are listed under each set of bars and color-coded labels denote regressors.

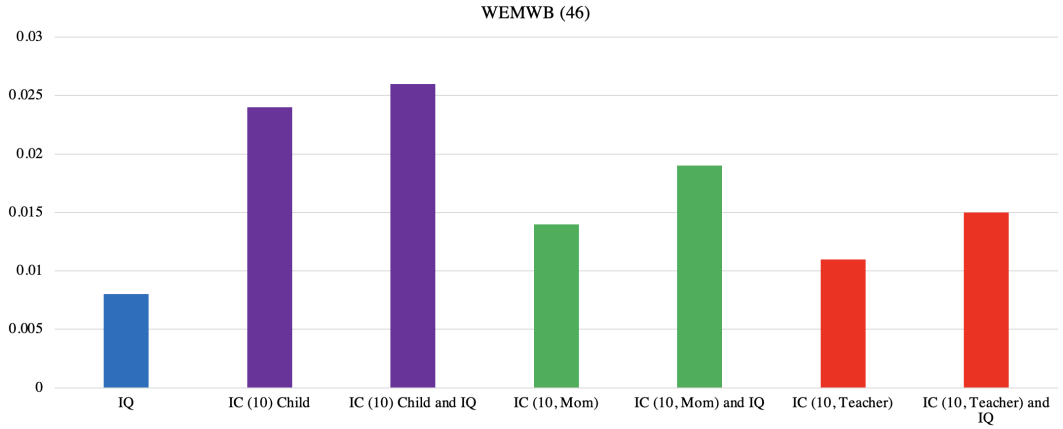
Figure 3.19: Breakdown of WEMWB (46) by IC Measures at Age 16



Bars display the adjusted R-squared from running regressions where the outcome is WEMWB (46) and the regressors of interest are denoted by the labels under each bar.

This results is not isolated. Figure 3.20 shows the adjusted R-squared when regressing WEMWB(46) on IC(10) and on mother's and teacher's assessments, IC(10, mom), IC(10, teacher). Once again, the child's perspective dominates the ones of their close, significant adults. We should note that Figure 3.20 omits personality traits as a regressor for a reason. BGHH teased out six personality traits from the BCS data. While self-esteem and locus of control were obtained from CMs' self-reports, the other four personality traits—disorganized, antisocial, neuroticism, introversion—were extracted from teachers' responses. Since a repackaging of the underlying items determine IC(10) and IC(10, teacher), personality traits were left out as a regressor to avoid mechanically induced correlations.

Figure 3.20: Breakdown of WEMWB (46) by IC Measures at Age 10



Bars display the adjusted R-squared from running regressions where the outcome is WEMWB (46) and the regressors of interest are denoted by the labels under each bar.

Figure 3.20 demonstrates the superiority of CM's perspective, IC(10), in predicting WEMWB(46) over contemporaneous perspectives of mother or teacher, IC(10, mom) and IC(10, teacher). While not as dominant as at age 16, the message is still clear: when it comes to predicting subjective adult, lifetime outcomes, the CM knows best, better than even close, significant adults in their lives.

The two measures of IC created for ages 10 and 16 help illustrate another important point. IC is a dynamic concept. Possible waxing and waning could be represented by appropriate laws of motion. It is conceivable that a 10-year-old experiences a stable home and wonderful peer relations. By the time she turns 16, however, a divorce can splinter the family and drag her into vicious custody battles, leading her to hide away out of shame, rarely interacting with her peers. Or, alternatively, imagine the converse where at age 10 the family was homeless and itinerant. Mother then found a stable job and decided to turn her life and the lives of her entire family around. By age 16, the CM experiences something akin to a stable environment both at home and at school. These are admittedly extreme examples conjured up to illustrate the dynamic nature of IC.

When it comes to predicting CM's subjective adult, life outcomes, the CM's own sub-

jective teenage/childhood perspectives tower over even close, significant adults' contemporaneous views. So it is worthwhile to examine where else the perspectives of children and mothers might differ.

Table 3.1: Pairwise correlations of Parenting Styles

	Aut (16)	Dem (16)	Perm (16)	Aut (5, Mom)	Dem (5, Mom)	Perm (5, Mom)
Aut (16)	1					
	4863					
Dem (16)	-0.3604	1				
	2907	3521				
Perm (16)	-0.1686	-0.1427	1			
	4561	2864	4752			
Aut (5, Mom)	0.0809	-0.0739	0.0389	1		
	3941	2868	3849	12523		
Dem (5, Mom)	-0.0452	0.0637	-0.0692	-0.5691	1	
	3971	2887	3880	12448	12644	
Perm (5, Mom)	-0.0594	0.0763	-0.0197	-0.702	0.5486	1
	3973	2887	3877	12448	12378	12611

Table 3.1 shows the correlations between the measures of PS measured by the mother at age 5 and those measured by the child at age 16. Surprisingly, we find that the Autocratic, Democratic, Permissive parenting styles (PSs) perceived by the 16 year old teenagers has negligible correlations with their mothers' views on these same concepts at age 5.

Here it is important to analyze what is measured in each instance. At age 5, clearly maternal views about child rearing is being assessed. At age 16 though, the CM answers questions pertaining to their parents as a unit. What would a child respond if their mother is a strict autocrat and father most permissive, or vice versa? While in principle that could be a problem, we believe in practice it is not. We argue that during the 1970's and 1980's, mothers were tasked overwhelmingly with child rearing duties. Maternal PSs are therefore

the most likely conjured up mental landscapes when the teenage CMs' are probed about parental practices. Further, economists document significant matching in marriage markets. Perhaps that matching extends also into parenting styles?[8] At the time of this writing we are not aware of empirical studies that measure the associations between the perceived (by child) paternal and maternal PSs. The best we can do for now is to offer our educated guess that the teenage CMs' PSs measure mainly maternal PSs as seen through the teenagers' own eyes.

While it can be argued that comparing PSs assessed eleven years apart ignore many potential dynamic changes, we counter by pointing out that lifestyle is pretty much set early on in a child's life (Ansbacher and Ansbacher, 1964; Stern, 1985). We argue that if we were able to assess the child's view at age 5 on their experienced PS, then these views will have changed only at the margin by age 16. Similarly, a parent's way of handling their child is likely mostly set by the time the child is 5. We do not consider here exceptions to the rule, such as parents and/or children undergoing successful psychotherapy, or experiencing life-changing shocks. On a population level, changes in views on PS occur at most at the margin (and that even though teenage years are known to be a particularly volatile period in a child's development) (Linnell, Maniacci, Pearson, and Phillips, 2021).

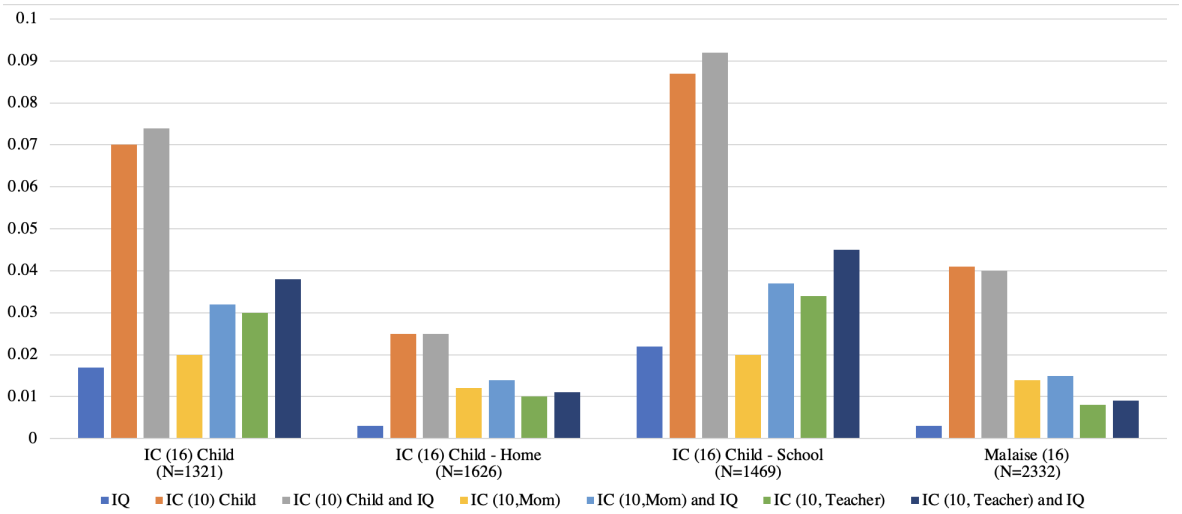
Maybe the lesson here is for us to contemplate the implications of the observed gap in perspectives. Perhaps the data beckons us as adults to redouble our efforts to communicate with children in ways that invite these children to feeling heard and validated. If our assumptions are right, then this skill appears to be underdeveloped by the mothers of CMs. Another potentially important corollary is the following. It may be worthwhile to assess personality traits in a cohesive way through the eyes of a single perspective because of our finding that

8. In her book Unequal Childhoods, Lareau (2003) documents that parenting styles differ across social class. This serves as an argument that since both parents are more likely to originate from similar circumstances (matching), it stands to reason that their PSs are more similar. We further note that clinical psychologists observe that how a parent perceived their own parents' PS profoundly influences their own child rearing (Maniacci, 2021; Pearson, 2021)

perspectives matter. Measuring some traits via one perspective and other traits via another perspective may lead to inconsistencies and systematic biases which can be avoided. We argue the literature should move in this direction.

The CM's perspective is clearly most important when predicting subjective adult life outcomes. Does this result hold when childhood outcomes are considered instead? Whereas previous analyses treated IC(16) as an independent variable and regressor, now let us switch perspective and consider IC(16) as a dependent variable. Furthermore, IC(16) is broken down into its' component parts, home and school, and we additionally consider the subjective outcome of CM's mental distress, Malaise (16). We regress these subjective childhood outcomes on IC(10), IC(10, mom), IC(10, teacher).

Figure 3.21: Measures at Age 16 regressed on clusters of IC measured at age 10



Bars denote the Adjusted R-squared from running regressions where outcomes are listed under each set of bars and regressors are denoted via the color-coded labels.

Figure 3.21 shows that the predictive power of IC(10) continues to dominate analogous contemporaneous measures of mother and teacher. Furthermore, contexts matter. At age 16 many teenagers go through a tumultuous period and strained relationships with their (exhausted) parents. This is a time when relationships may be more fraught at home, with the consequence that children may feel less belonging towards home. Moreover, this happens

also to be the period when mandatory schooling ends[9] and for our particular cohort (born in 1970) also a period for whom a teacher strike occurred. Which of the two domains experiences more upheaval? Let us analyze the various regressors (our lenses) for the contextual information they harbor.

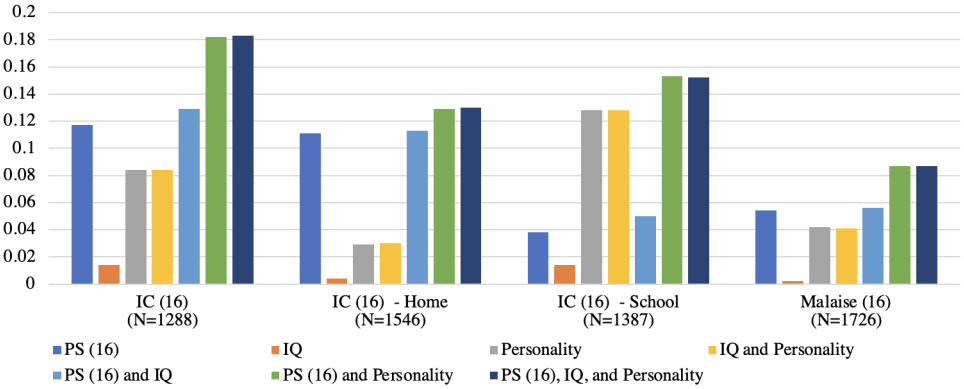
IC(10, mom) measures child's IC preteen mainly as experienced at home through mother's lenses. IC(10, teacher) measures child's IC at age 10 at school as seen by the teacher at the time. IC(10) assesses a mixture of IC at home and at school through the child's perspective. However at age 10, the child is embedded in the school domain for years to come. Therefore, IC(10) contains a solid school component. The last lens PS(16) is the 16 year old's appraisal of democratic parenting styles at their home.

Figure 3.21 shows that IC(10) dominates all contemporaneous measures. Maybe the larger predictive power for IC(16)-school than for IC(16)-home hints at the CMs feeling more upheaval at home than at school? That the teachers of 10-year-olds predict child's IC(16)-school more than mothers' IC(10, mom) makes sense, even though school and teachers differ at age 16. That mother has (slightly) more predictive power over teachers' perspectives on home and malaise issues, IC(16)-home and Malaise(16), makes also sense since mother normally runs the household and is in charge of the child's mental health.

What is remarkable though is that PS(16), which theoretically is a measure of how the child experiences their parents' child-rearing, is so spot on in terms of being a sharp probing lens (in terms of predictive power) at home IC(16)-home, a good lens for Malaise(16), and a much weaker instrument in predicting IC(16)-school, see Figure 3.22. Hence, contexts clearly matter.

9. Many CMs were also at the verge of leaving home. More detailed investigations are possible with the existing BCS data, because CMs were queried at age 16 whether they plan to stay at or leave home.

Figure 3.22: IC(16) and Malaise(16) on PS(16)



Bars denote the Adjusted R-squared from running regressions where outcomes are listed under each set of bars and regressors are denoted via the color-coded labels.

Incidentally, Figure 3.22 addresses the enigma posed by regressing Malaise (46) on PS. We wondered whether PS would continue to lack predictive power (as it did when regressing Malaise (46) on PS) when regressing Malaise (16) on PS (16). We find that regressing contemporaneous Malaise (16) on PS shows predictive power. However, the effect is about half to what is found when regressing IC(16) (now used as outcome) on PS, see Figure 3.22.

Apart from the IC(10)'s predictive power towering over that of mother's or teacher's views, Figures 3.21 and 3.22 hint that contexts matter. Whereas school is the domain of teachers, home and mental health are areas where mothers exert more influence. Here we see the association of the teacher when CM was 10 years old and that still carries predictive power for CM's feeling of b & s towards school six years later—even though the teenagers' teachers and schools differ. Notice too that IC(10) appears to have more predictive power for IC(16)-school than IC(16)-home.

In sum, this section emphasizes the importance of perspectives and contexts. We discussed our findings as they pertain to subjective outcome measures. We interpret our results to mean that CMs understand best their own subjective worlds and choose accordingly, especially when it comes to subjective adult outcomes at age 46. Even their own mothers cannot compete when it comes to predicting CMs' subjective outcomes three decades later.

Further, the teenage CM's perceptions differ from the perspectives of others, even their close, significant adults nearby.

We conclude this section with a thought. We have observed that when it comes to adult social outcomes the predictive power of IC was attenuated. We thought that this may be so because the CM must take into account others. This leads us to hypothesize that measuring IC when the CM is freer (and less constrained) would lead to sizable enhancements in predictive powers on subjective adult outcomes compared to the already large effects found with IC(16). We reason here that at age 16 the CMs still live with their parents and are constrained—akin to the environments found in social outcomes. At the parents' homes, teenagers are influenced by and influence in turn household members.

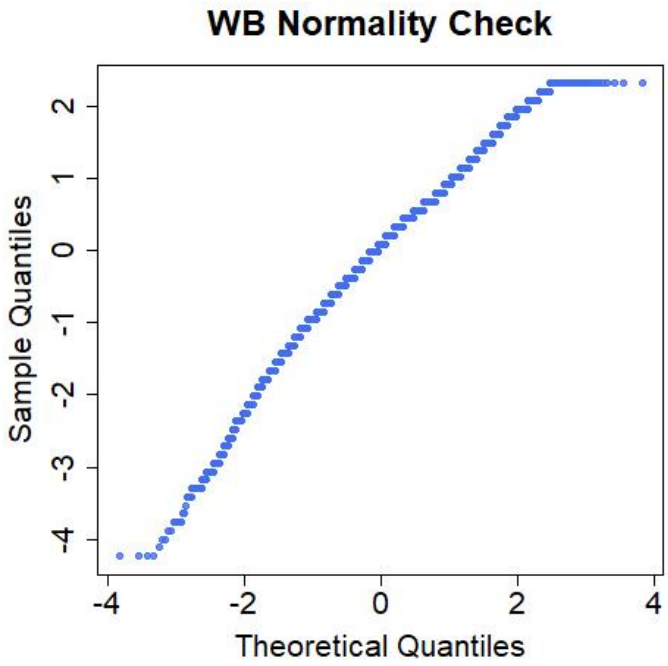
We have observed that IC and PS offer complementary views into the subjective worlds of CMs. This serves as motivation for the next Section to continue probing the linkages between IC and PS on well-being (46).

3.4 Analysis of Variance on Well-Being

Now that we established that IC and PS are not synonymous, we explore how both IC and PS affect Well-Being (WB) as measured by the Warwick Edinburgh Mental Well-Being scale.[10] Fig. 3.23 ascertains the WB distribution approaches normality, thus the underlying assumption of ANOVA (analysis of variance) holds. Our ANOVA analysis is then justified and trustworthy.

10. We use the standardized factor scores arising from a factor analysis of the 14 WEMWB items everywhere, except in this Section 3.4. This Section 3.4 alone uses instead the standardized values of the actual WEMWB scale as advocated by Tennant et al. (2007). Because the correlations between the factor score and actual WEMWB scale is 0.996, we are not concerned about reaching different conclusions using the other measure. The associated scree plot clearly demonstrates the dominance of a single factor, which offers an additional insight about this cohort's subjective well being measure.

Figure 3.23: WB Normality Check



Before conducting the ANOVA study, a few exploratory figures will be shown. Divide up the IC distribution into lowest tertile (low IC), middle tertile (medium IC), and highest tertile (high IC). Fig. 3.24 is a whisker plot with WB(46) (WEMWB) as outcome. It shows that

- High IC has the lowest variance, highest WB median, and highest box.
- Medium IC has the 2nd lowest variance, 2nd highest WB median, and 2nd highest box.
- Low IC has the highest variance, lowest WB median, and lowest box.

Similar results ensue when PS is partitioned into lowest tertile (undemocratic PS), middle tertile (intermediate PS), and highest tertile (democratic PS), see Fig. 3.25.

Figure 3.24: Box-and-whisker plot of WB versus IC

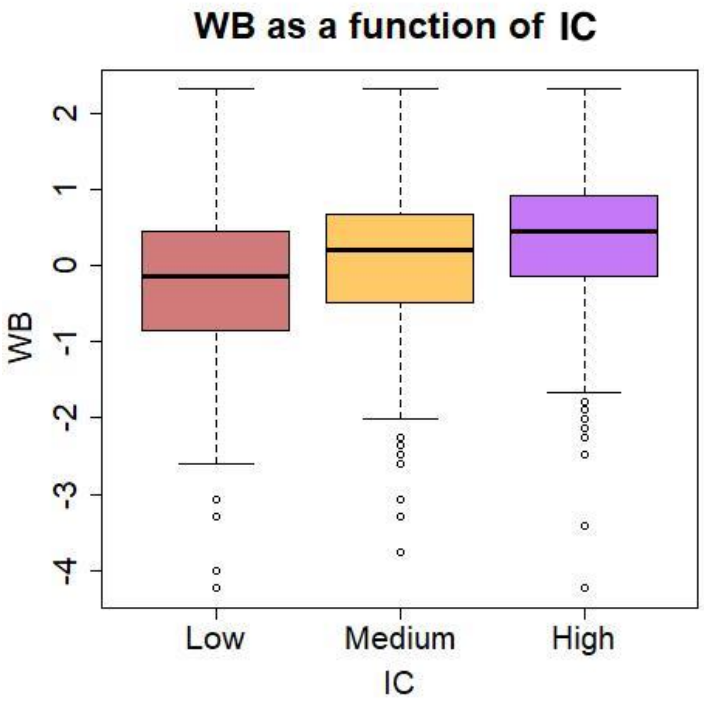
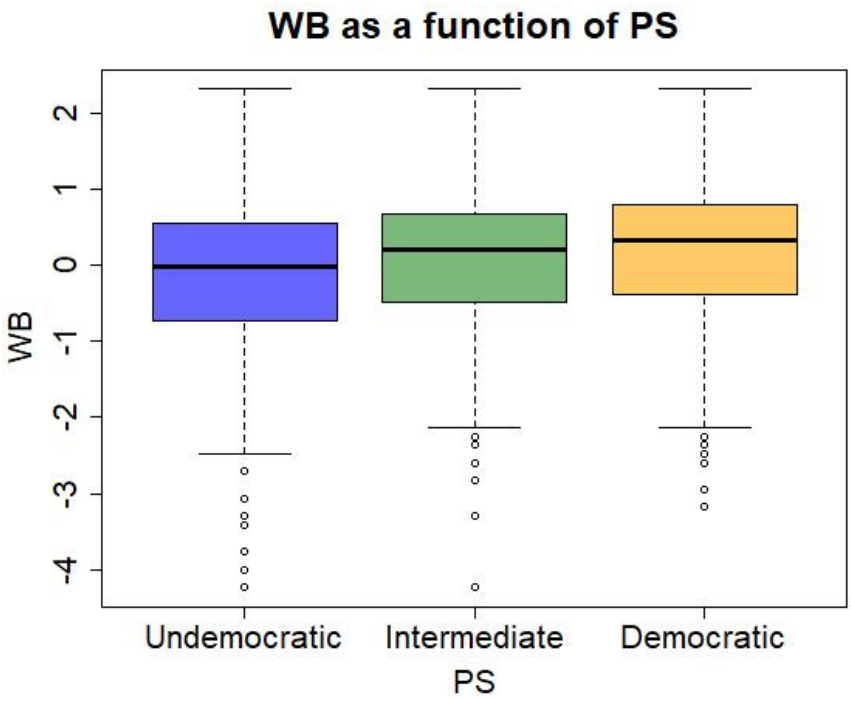


Figure 3.25: Box-and-whisker plot of WB versus PS



The raw scatterplots for WB versus IC and WB versus PS are given in Figures 3.26 and 3.27 respectively. The dashed vertical lines demarcate the tertiles. The scatter plots, Figures 3.28 and 3.29, add relevant details to the whisker plots, Figures 3.24 and 3.25, respectively. The low IC tertile is comprised of not only the largest variation in WB but also in PS as well. This can be best appreciated when comparing Figures 3.28.A (low IC) with 3.28.C (high IC). Likewise the (undemocratic PS) tertile experiences the largest spread in WB and in IC as the comparison between Figures 3.29.A (undemocratic PS) with 3.29.C (democratic PS) clearly reveals.

Figure 3.26: Scatter plot of WB versus IC

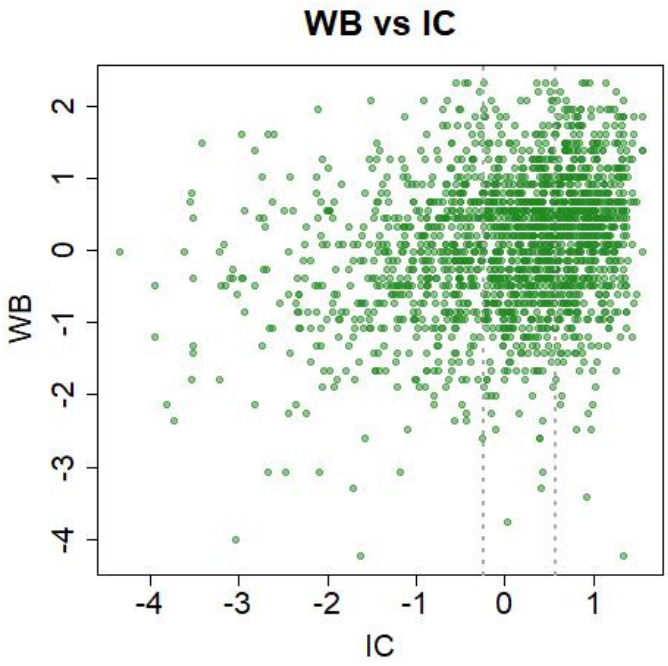


Figure 3.27: Scatter plot of WB versus PS

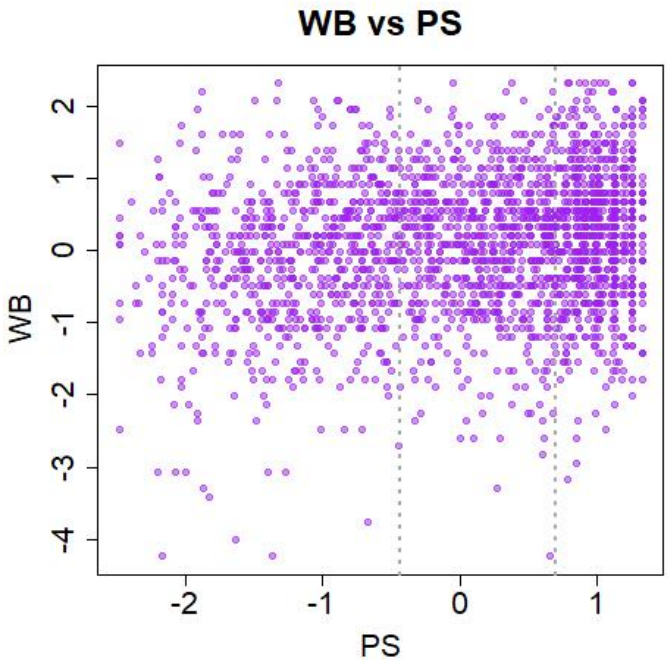


Figure 3.28: Scatter plots of WB vs PS for each IC tertile separately.

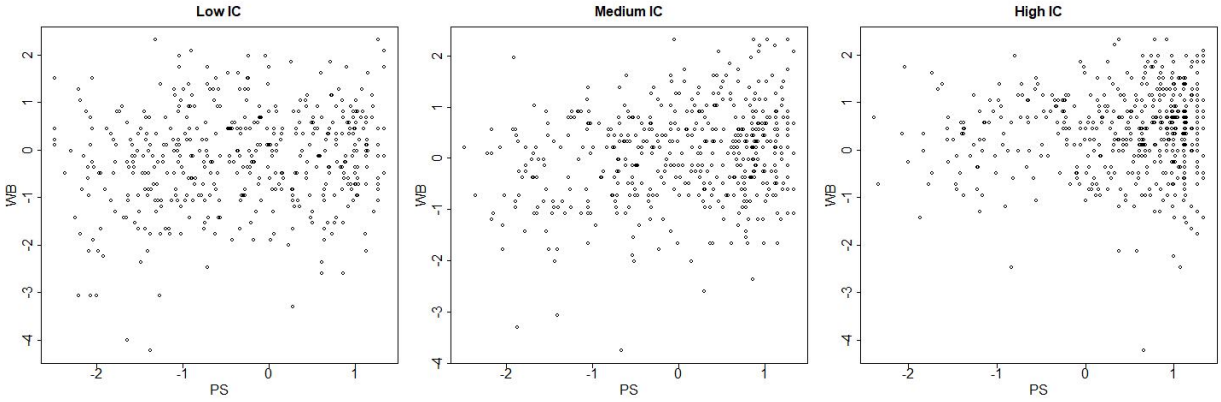


Figure 3.29: Scatter plots of WB vs IC for each PS tertile separately.

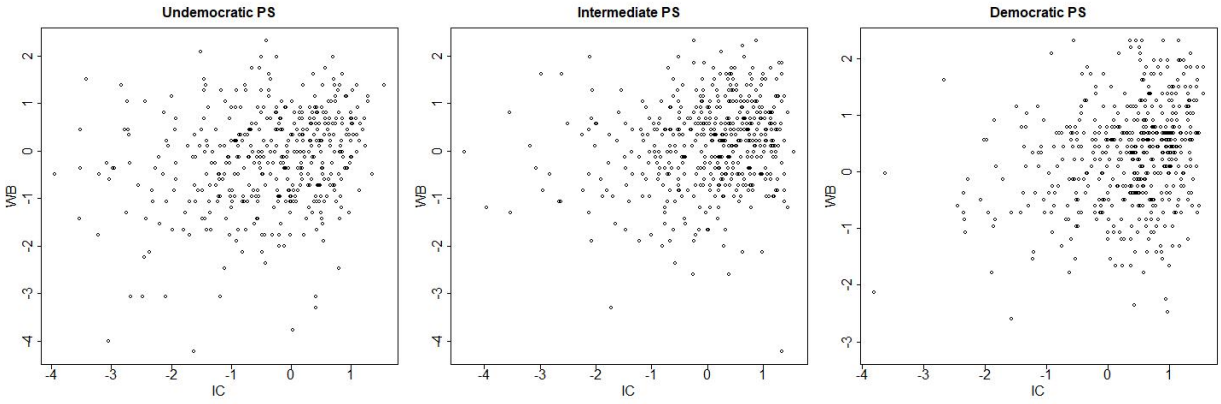
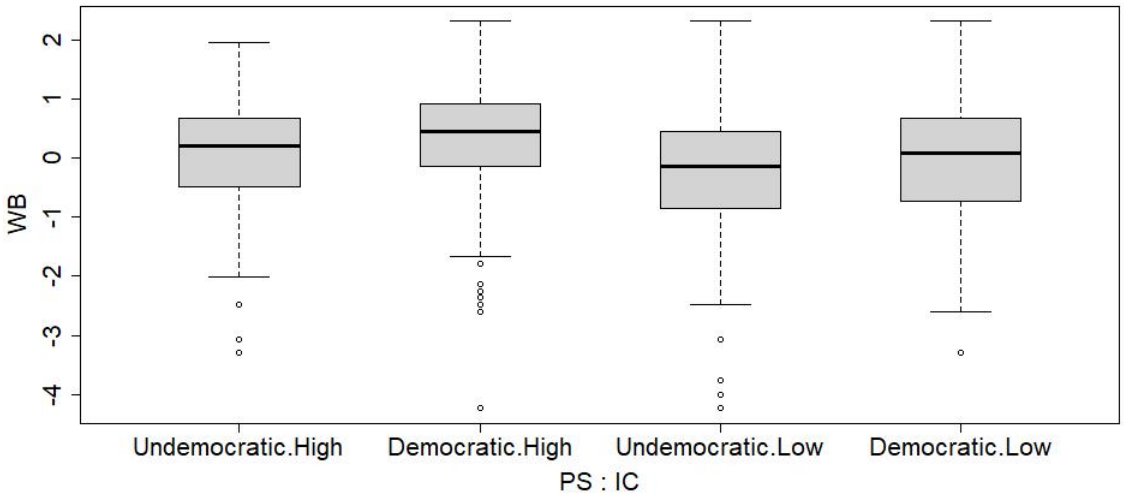


Figure 3.30: ANOVA



With these preliminary investigations out of the way, we embark on our main ANOVA analysis. In contradistinction to the tertile classifications adopted earlier, now the sample is divided up along the medians of IC and PS, respectively, which are then christened as High and Low for IC and Democratic and Undemocratic for PS. Figure 3.30 plots WB against the 4 possible combinations of IC and PS:

- (High, Dem) combination yields the lowest variance, highest WB median, and highest box.

- (High, Undem) combination yields the second lowest variance, second highest WB median, and second highest box.
- (Low, Dem) combination yields the highest (4th lowest) variance, 3rd highest (2nd lowest) WB median, and 3rd highest (2nd lowest) box.
- (Low, Undem) combination yields the 2nd highest variance, lowest WB median, and lowest box.

An ensuing ANOVA of WB was performed, with main effects for IC and PS indicators, and an interaction term. The main effect for IC is significant (p-value = $3.17 \cdot 10^{-15}$) and the main effect for PS is also significant (p-value= $4.06 \cdot 10^{-5}$). The interaction term is not significant (p-value=0.462). These results suggest that there are effects of IC and PS on WB, and that their effects are additive since the interaction is not significant. The conclusion from the ANOVA is that there is a difference in WB between the groups.

CHAPTER 4

THEORETICAL MODEL

"Not by might, nor by power, but by my spirit, saith the LORD of hosts." (Zechariah 4:6)

The BCS data show that Intrinsic Capital matters to important lifetime outcomes. This emboldens us to construct a model which incorporates socio-emotional aspects to traditional inputs that economists consider important, income/wage. In particular, we would like to understand the determinants of IC, its value and its role in the mechanisms behind intergenerational (IG) mobility. Heckman and Landersø (2021) use intergenerational (IG) mobility measures to probe how flexible (rigid) societies are. Is a child from a disadvantaged family condemned to live in squalor (i.e., low IG mobility)? Or do we observe high levels of IG mobility (i.e., a less rigid society)?

Heckman and Landersø (2021) compared equality of opportunity across Denmark and the USA. Income inequality is larger in the US, and Denmark's social safety net is much richer, with universal preschool and free public college tuition for all. Yet, the authors find that these differences do not generate a measurable dent in "equality of opportunity". The more privileged in Denmark learned to game the system better and benefit disproportionately from the Danish welfare system. The authors document a "Matthew effect"[1]—to those who have, more is given. The authors conclude that the Danish social welfare policies have not solved the question of how to create a system with equal opportunities for all [of how to create a more just society] and that the answers lie elsewhere. They suggest that family structures may be pivotally important—calling for further investigations. Based on our empirical results on the importance of IC, this chapter incorporates IC and traditional economic measures, considering intergenerational mobilities in the presence of both.

One of the inferences from the findings presented in Chapter 3 is that while certain traits,

1. For a description of the Matthew Effect, see Merton (1968).

SES and education levels, etc. are important when it comes to subjective adult, life outcomes, what the individuals make of those factors is of equal and sometimes greater importance. A century ago Adler coined the term "Gebrauchspsychologie gegen Besitzpsychologie," which translates into English as "Psychology of use versus psychology of possession" (Ansbacher and Ansbacher, 1964; Mosak and Maniacci, 2013). Considering how traits are being used and not only to focus on what traits an individual possesses is called "psychology of use."

This idea has become one of the cornerstones of Adlerian work validated by a history of clinical success and can be traced back to earlier philosophies.[2] Psychology of use posits that to make sense of an individual's lifestyle and to encourage them it is important to examine how the individual uses their traits—in addition to what traits they actually have. Stephen Hawking did not resign himself to death from his incurable disease (his given trait, his medical situation) but rose to greatness. How come children with identical observable traits facing hardships and obstacles, some show remarkable resilience and others succumb?

This Chapter is our first attempt in modeling "psychology of use" by utilizing the comprehensive concept of IC. Motivated by our empirical findings that Intrinsic Capital matters, we developed this model to incorporate IC and traditional economic aspects (e.g., wages) into an intergenerational framework. The model then tries to capture the transmission of wealth and human capital via parental investments in their children—all along underscoring the importance of IC.

Our approach can be viewed as complementary to the Human Capital development literature which has been leaning towards a pedantic building up of skills approach. Here we invite the reader to also consider how traits are being used—via IC or other concepts—and not only to focus on what traits an individual possesses.

The continual changes of environments experienced by any human call for dynamic mod-

2. We have not conducted a formal study, but we were able to find roots of that idea in Chasidut (Epigraph Text) with pointers going much further back in time. We are sure many other religions/cultures/philosophies have developed similar concepts.

eling of IC, with its' attendant laws of motion. Exploring potential syntheses of the traits approach with the"psychology of use" one is another promising research area. Even though these refinements are very interesting, they lie beyond the scope of this thesis.

4.1 Basic Model

The theoretical model is based on Mulligan's model (Mulligan, 1997) on parental altruism choice, which is in turn based on Gary Becker's analyses on parental altruism (Becker, 1994). Edgeworth (1881) is one of the earliest explicit references where an altruism parameter enters multiplicatively. Of course, Adam Smith can be considered the father of all these ideas:

"Every man feels his own pleasures and his own pains more sensibly than those of other people.... After himself, the members of his own family, those who usually live in the same house with him, his parents, his children, his brothers and sisters, are naturally the objects of his warmest affections. They are naturally and usually the persons upon whose happiness or misery his conduct must have the greatest influence." (TMS 1853, p. 321)

This model builds on their work by considering a single parent t giving birth to a single child $(t+1)$. The parent is endowed with a wage w_t and IC b_t. The parent has to choose how much to consume, and how to allocate their (one unit of) time (Becker, 1965; Ghez and Becker, 1975). They can either invest in academic matters for their child, $a_t \in [0,1]$, invest in child's IC, $l_t \in [0,1]$, or spend time on work and earn a living, $1 - a_t - l_t$.

The parental value function is given by

$$V_t(b_t, w_t) = \max_{c_t, a_t, l_t} \left\{ u(c_t) + b_t \, V_{t+1}(b_{t+1}, w_{t+1}) \right\} \tag{4.1}$$

subject to

$$0 \leq c_t \leq w_t \left[1 - a_t - l_t\right] \tag{4.2}$$

$$a_t, l_t \geq 0 \tag{4.3}$$

$$w_{t+1} = \begin{cases} w_H & a_t \geq a_c \\ w_L & a_t < a_c \end{cases} \tag{4.4}$$

$$b_{t+1} = \begin{cases} b_H & l_t \geq l_c \\ b_L & l_t < l_c \end{cases} \tag{4.5}$$

There are only two possible wages, $0 < w_L < w_H$, and two IC values, $0 \leq b_L < b_H < 1$. The last inequality, $b_H < 1$, guarantees that the value function is well defined for any policy function. Inequality (4.2) with $w_t > 0$ imply that the time spent on work must be non-negative,

$$1 - a_t - l_t \geq 0. \tag{4.6}$$

Subscript "c" denotes critical value, i.e. threshold. If parent devotes less time than the required critical amount of time on an activity, the child will remain in the low state. The parent must exert at least the critical amount of time to bump up the child to the higher state.

The model also assumes $u(c) > 0$ for all feasible consumption bundles c. This is to ensure that the parent would not want to choose a low b_L simply because offsprings' consumption is generating a negative utility.

A parent's sense of belonging has multiple domains, such as family, work, friends and other communities. The model introduces only parent-child interactions and allows for a long-range view of the parent toward the welfare of their dynasty. The model channels all these possible parental associations onto the one and only other existing agent in the model, the child. Parental IC is being condensed into the parental sense towards his offspring. We

deliberately use the term offspring because thoughtful parents with a long-range view care about their entire dynasty. Explicitly the parent only experiences the child's value function multiplied by their b_t.

An astute reader may wonder at this point why b_t was not called nurturing capital or familial capital. Here it is important to emphasize the far greater generality contained in IC. The ramifications of a child who grows up feeling secure and grounded extend far beyond its' immediate family. The improved efficiency in social interactions—be it at school, at work, in civic duty, political engagement, community service, or even in developing and deepening meaningful relationships with friends and peers, etc.—cannot be overemphasized. IC is a far better term to capture all that. While nurturing or familial capital is an important component of b_t, labeling b_t as just that would be a disservice to this larger idea.

Stark predictions ensue when one further sets

$$b_L = 0. \tag{4.7}$$

A $b_L = 0$ parent puts zero weighting on their child's value function, and thus optimally chooses

$$a_t^* = l_t^* = 0. \tag{4.8}$$

Then

$$V(b_L = 0, w) = u(w) \ \ \forall w. \tag{4.9}$$

All further generations in this dynasty are condemned to live in squalor. This can be seen from Eqs. (4.4) and (4.5), respectively implying $w_{t+1} = w_L$ and $b_{t+1} = b_L$. By the same argument then, $w_{t'} = w_L$ and $b_{t'} = b_L$ for all $t' > t$—completing the proof. In other words, (b_L, w_L) is an absorbing state. Notice that the dynasty cannot be lifted out from the absorbing state even when social security measures give a generation an income of w_H—with implications to Heckman and Landersö's puzzle mentioned earlier in the Chapter. b_L is the

source of the trap. Successful interventions need to boost Intrinsic Capital.

Soheili, Alizadeh, Murphy, Bajestani, and Ferguson (2015) conducted such a RCT intervention. The treatment consisted of guiding teachers to connect more with their 4^{th} grade students, to encourage and uplift them. The teachers were presented with tools of how to enlist the entire classroom to solve problems and to improve on students' social and cooperation skills. Their results showed a 2σ improvement in a measure that is in its' essence "IC-school" with a concomitant large improvement in math scores. This approach has proven effective elsewhere (Nelsen, 1979; Platt, 1979; Dreikurs, Grunwald, and Pepper, 1982; Pourchez, Goudin, and Carlier, 2020).

Another piece of evidence can be gleamed from lifetime trajectories of individuals who experienced childhood trauma. Because of ethical reasons there exist no causal studies, only correlational ones. Still these are worthwhile to ponder upon. Traumatized children experience worse lifetime outcomes than individuals who did not experience such trauma—except if a caring adult steps in (Meichenbaum, 2012). Then the ensuing outcomes approach those of "normal children" (Meichenbaum, 2012). This suggests the importance of stable, nurturing relationships. It is important to note that the caring adult need not be a parent.

4.2 Model Extensions

The model presented in section 5.1 is simple, yet it delivers a stark point. The model's main goal is to highlight the importance of socioemotional aspects in the production function of child's academic skills and/or child's IC. Straightforward modifications could extend the model's reach. For instance, at present a parent with low IC will neither invest in child's academic matters nor in child's IC. As a counterpoint, consider a b_L parent who is not interested in investing their time on emotional matters, but is focused on improving child's academic skills. Such a behavior cannot be described with the current model, because parent's $b_L = 0$ puts zero weight on the child's value function. Future refinements of this

model could consider cases such as when b_L is assumed to be larger than 0 or cases that take into account the degree of efficiency or availability of resources of parents.[3]

The model could be made more realistic by incorporating the fact that low income parents are more constrained than high income parents—in experiencing higher costs and/or in lower child rearing efficiencies. The present model assumes a constant and equal marginal return to a unit of l_t or a_t investment for both poor and rich parents. This need not be true. While both have a single unit of time to allocate along their choices, this unit does not render the same return on investment across groups. The model assumes that the same amount of time is required for a high or low income parent to increase their child's wage and/or IC. The only difference would be that a high income parent would be able to consume more, on account of having a higher wage.

4.2.1 Market Inputs

Real life is neither that equitable in resources nor in child-rearing efficiencies. Consider first the inequality in resources. A high-income parent could pay for their child to enroll in the most prestigious preparatory schools thereby much increasing their child's chances to make it into Oxbridge. A low-income parent does not have the resources to increase their child's chances in such a manner. An Oxbridge education not only opens doors to lucrative jobs and careers, it also offers high society connections–thereby catapulting the child to higher standards of living and success in life. Equality of opportunity is nowhere in sight.

To accommodate for such differences, one can add marketable inputs into the production function of w_{t+1} and potentially also b_{t+1}. Such inputs enter the budget constraint of the parent. Since w_H parents have higher earned income, they are willing to purchase more marketable inputs (as long as u is concave, as is typically assumed) and hence enjoy an advantage over w_L parents.

3. Alternatively, future research could incorporate parts of the child's income stream into the parent's budget constraint—thereby incentivizing a parent who would otherwise not care about their child's welfare.

For instance, this can be modeled by modifying the budget constraint 4.2 such that

$$0 \leq c_t + e_t \leq w_t \, [1 - a_t - l_t],$$

where e_t is the cost—i.e., the parental expense—in sending their child to prestigious preparatory schools, expensive and fancy after-school activities and/or private tutoring (or in a simpler version a dummy) and serves as another parental choice variable. Then analyze the parental optimization problem with production functions for b_{t+1} and for w_{t+1} which now also depend on e_t.

Bukodi et al. (2019) inform us empirically about the outcome of such exercises. The resource rich buy themselves a good education, while the resource poor climb the education ladder mainly through lifelong vocational upgrade trainings. In other words, the w_H parent has many costly avenues available to uplift their child, while the w_L parent has none. Here we have an instance of the Matthew effect documented by Heckman and Landersø (2021). Under the sensible assumption of complementarities (see Section 4.2.4), one highly effective way to help poor families would be to build up their IC because a higher IC boosts their productivities.

4.2.2 Differential Child-rearing Technologies

Similarly, the model is agnostic about parental (child-rearing) quality. It is reasonable to assume that a high income parent has gotten more years of schooling under their belt than a low income parent. They would then be more qualified to help their children in academic matters. What would perhaps take a w_H parent 15 minutes, could easily be either completely out of reach for a w_L parent, or would take them much longer to convey. The model in its present form is too naive by brushing under the rug the inherent differences in parental qualities of time (Guryan, Hurst, and Kearney, 2008; Kalil, Ryan, and Corey, 2012; Kalil, 2015).

Differences in resources could be built into the model by replacing (4.4) with

$$w_{t+1} = \begin{cases} w_H & \text{if } w_t \cdot a_t \geq a_c \\ w_L & \text{otherwise,} \end{cases} \tag{4.10}$$

acknowledging that w_H parents have more resources than w_L parents in building up their child's academic skills.[4] This holds true in both the material (market inputs) and parental time-quality spheres.

Likewise, a sensitive, caring parent will employ their social skills to boost their child's sense of IC, while a b_L parent would continue to alienate their child with their rigid and inflexible attitudes:

$$b_{t+1} = \begin{cases} b_H & \text{if } b_t \cdot l_t \geq l_c \\ b_L & \text{otherwise.} \end{cases} \tag{4.11}$$

When low and high income parents experience vastly different production technologies in building up their child's academic skills and/or child's IC, enough complexities to capture interesting scenarios may have been introduced. For instance, a low-income parent may face excruciating choices which the more resource rich w_H parent simply does not have to deal with. One salient case in point would be the observed rise in income inequalities over recent decades. This corresponds to increasing the w_H/w_L ratio in the model. The increase incentivizes low resource parents to invest more in their child academic matters, sacrificing building up their child's IC, to the dynasty's detriment over the long run.

Low income parents could very well understand that both w and b are important but face limited resources and may not achieve both for their children. Their trade-offs differ from those faced by high-income parents, putting them at a disadvantage. Different production technologies of producing child's skills lie at the heart of more accurate renderings of reality.

4. This formulation shows the increased cost on a w_L parent versus a w_H parent. Depending on the real-life situation to be modeled, the cost on the low-income parent could be exorbitant ($w_L < a_c$), or high yet still manageable ($w_L > a_c$).

4.2.3 Parental Values

A supportive and attentive parent takes pride in their child's accomplishments and in that their child is well-grounded in society and social environments. This can be modelled by adding a term dependent on b_{t+1} to the parental value function. Then there are parents who are obsessed by their child's career advancements, job successes, or status/prestige more generally—representable as a function of w_{t+1}. Real parents display elements of both, being "sensitive/attentive" and "materialistic" to varying degrees. They differ in how much importance they ascribe to each. One simple way to incorporate those parental attitudes could be

$$V_t(b_t, w_t) = \max_{c_t, a_t, l_t} \Big\{ u(c_t) + \beta \cdot b_{t+1} + \gamma \cdot w_{t+1} + b_t \cdot V_{t+1}(b_{t+1}, w_{t+1}) \Big\}, \tag{4.12}$$

with β and γ serving as appropriate parental weights.

4.2.4 Complementarities between w and b

While at the earliest ages the child's dominant social environment is home, at school-age this environment expands to include the school. School is an academic institution where learning takes place. A child who fails in all his/her studies will feel that he/she does not belong there. Thus a parent singularly focused on investing on their child's academic matters at home would still beef up their child's sense of IC. The child's being more on top of his/her academic studies and increased ability to assist others enhances their sense of IC.

Alternatively, there are educators who entertain the hypothesis that a sense of IC is a prerequisite for any meaningful learning and academic achievements. Such complementarities can be embedded into the model by allowing b_{t+1} and w_{t+1} to be continuous and differentiable such that:

$$\frac{\partial^2 b_{t+1}}{\partial a_t \partial l_t} > 0 \tag{4.13}$$

$$\frac{\partial^2 w_{t+1}}{\partial a_t \partial l_t} > 0. \tag{4.14}$$

We posit that academic a_t time and "building up IC" l_t time are complements. As such it would behoove even the most strict disciplinarian to devote some l_t time with their child, because the one type of time they really care about, academic time, will be made so much more productive. Analogous reasoning holds for the wage dimension. Complementarities beckon the parent to devote quality time with their child. For optimal productivity, the parent will balance his time uses. With these ideas on the table, a key point can be addressed: In many instances, both types of investments occur simultaneously.

4.2.5 Parental Multi-tasking

When building up a child's academic skills and IC, many parents are actually multi-tasking. Furthermore, parents differ widely in their efficiencies of producing child's academic skills and IC as discussed in 4.2.2. The parallels to classic human capital (HC) production are striking. Becker and Murphy (1992) and Lozano (2001) developed a formalism to describe multi-tasking in house-hold production. Jaffe, Minton, Mulligan, and Murphy (2019) discuss a technology to handle heterogeneous efficiencies, which can be used in the context of producing different flavors of HC. Well-honed techniques exist to incorporate multi-tasking phenomena into our framework. We are therefore well equipped to describe the following scenarios.

The most attuned parents are able to effortlessly blend together the academic and the socio-emotional. Their kind, compassionate discussions on diverse academic matters is done in ways that is perceived by the child as encouraging, uplifting, energizing–thereby building up simultaneously both academic skills and Intrinsic Capital. At the other extreme, rigid, autocratic parents may spend hours in vain on math with their child, but only succeeding

in building up resentment and frustration in the child—thereby diminishing the child's IC.

Both types of parental investments are needed and optimally could be supplied simultaneously. An engaged parent who guides and encourages their child with compassion, caring and wisdom is so much more efficient than a parent who is unable to connect with their child. The most successful parents are the ones who are able to meet their children where their children are truly at (Adler, 1930; Dreikurs et al., 1982; Dinkmeyer and Dreikurs, 2000; Kohn, 2006, 2018).

4.3 Conclusion

Though the model (4.1) - (4.5) is simple, it may not be a too far-fetched scenario from real life. The model exhibits the different roles played by IC in different stages of life. When the child is young and wholly dependent on their parent, it is on the parent to encourage and guide the child—to uplift the child; with enormous long-term benefits. An encouraged and uplifted child accomplishes so much more. By the very nature of feeling more grounded, safe and secure (a higher sense of IC) it will nurture and uplift the next generation.[5] A virtuous feed-forward process has been set into motion—a kind of virtuous recursive mechanism.

While the likelihood of a virtuous outcome increases in the case of a sensitive, encouraging parent who feels secure and safe, the flip side must be reckoned with. If the parent feels they have no place in their worlds an entirely different vicious recursive process is unleashed. The model is warning that dynasties can get stuck in multidimensional poverty traps. Interventions exogenously enhancing b would have the fortuitous effect of jolting the affected dynasties out from their traps. This serves as motivation to run future RCTs to enhance IC of students in school settings.

5. The causal link is clear. The patient building up of the child's sense of b & s comes first. Only individuals imbued with this sense are then able to nurture and uplift the next generation. "Nurturing capital" requires IC.

CHAPTER 5

INTERGENERATIONAL ANALYSIS

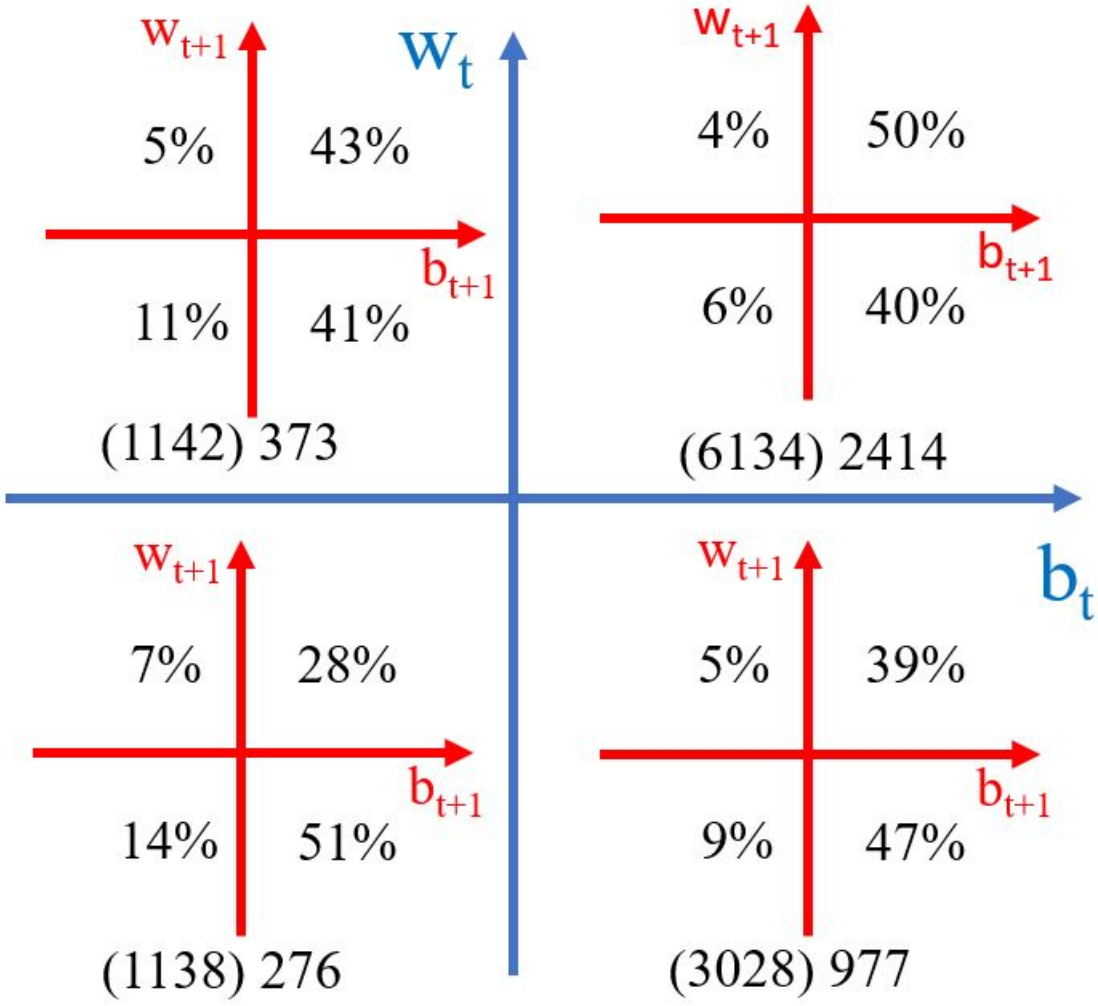
An interesting line of research in the area of human flourishing is that of Heckman and Landerso (2021). Instead of simply measuring static outcomes, the authors compare intergenerational (IG) mobilities of traditional economic measures in Denmark and the USA. Our theoretical model invites us to investigate empirically intergenerational mobilities in the combined traditional and non-traditional economic and socioemotional dimensions.

There is an ample literature describing intergenerational persistence in income (Solon, 1992; Mazumder, 2005; Lee and Solon, 2009; Corak, 2013; Chetty et al., 2014, 2017; Davis and Mazumder, 2020; Heckman and Landersø, 2021; Chetty, 2021). Measures hover in the range of 0.1-0.4. Heckman and Landersø called attention that most of these studies are snapshot measurements and don't really reflect the true persistence. They argued to use more robust measures, such as permanent income, or income averaged over a decade or more so as to capture a more solid picture of the true IG transmission. When they use those more robust measures smaller IG persistencies emerge.

Likewise, unidimensional IG studies of malaise have been conducted (Johnston et al., 2013). The authors constructed robust measures of maternal malaise and child's malaise by averaging over several readings occuring over several waves. They found an IG persistence of 0.1-0.2. This thesis refrains from such analyses for two reasons. These unidimensional IG mobility studies use linear regressions. There are no compelling theoretical reasons to assume linear relationships (Heckman and Landersø, 2021). Second, we attempt to study multidimensional IG mobilities. In addition to potential non-linearities appearing in unidimensional relationships, there could be complex interactions occurring between b and w. We felt it would be most prudent to group the variables into High and Low categories, thereby providing an avenue to analyze the data in the most model-independent way currently possible. The results will be discussed after explaining how our analysis was set up.

Recall that w_t denotes parental income and b_t parental IC, and the subscript $t+1$ denotes child's variables. The intergenerational transition from parent's (b_t, w_t) to child's (b_{t+1}, w_{t+1}) is shown graphically. The parental coordinate system informs in which quadrant the parental variables (b_t, w_t) lie in. The number of observations for each parental quadrant is N_{tq} for quadrant $q \in \{\text{I, II, III, IV}\}$ and is displayed in the relevant quadrant.[1] Figure 5.1 displays this information using X for b and Y for w.

Figure 5.1: Intergenerational Analysis Results



1. The number in parentheses shows the number of parental observations (b_t, w_t) falling in that parental Quadrant. The second number–the one without parentheses–lists the number of these parental observations with non-missing child's information, that is where all the 4 variables $(b_t, w_t, b_{t+1}, w_{t+1})$ are non-missing.

Into each parental quadrant, a similar graphical representation is embedded with children's information (red coordinate system) and shows fractions of children in each children quadrant conditional on their parents' classification. In this fashion, Figure 5.1 provides a quick visual representation of the percentage of children in each quadrant, given where they started (i.e., parental measures).

Ideally, b_t (b_{t+1}) assesses the parental (child's) IC. While it could be argued that such measures exist for the child, unfortunately the BCS data does not provide parental IC information, i.e., information on the parent's sense of belonging and significance. Instead, the IG analyses here use the data on malaise with the following modification. b_H denotes low mental distress, while b_L denotes high mental distress. Fortunately, the BCS delivers both maternal and Cohort Member's malaise measures.

Although malaise and IC are highly correlated, and so are WB and malaise,[2] our analyses will not mix and match by taking maternal malaise scores for b_t with child's IC or WB scores for b_{t+1}. Mehta, Croudace, and Davies (2015) cautioned that there is much more work that must be done before a satisfactory understanding of the relationship between malaise and WB (and by extrapolation between malaise and IC) emerges. Our analysis therefore uses malaise throughout for parent and child so as to avoid unnecessary complications.

Table 5.1: IG Variables

Variable	**Description**
w_t	Total gross weekly family income (CM age 10)
b_t	Mother's Malaise Score (CM age 10)
w_{t+1}	CM's Log Weekly Net Pay at age 38
b_{t+1}	CM's Malaise Score at age 34

Table (5.1) summarizes the variables used in the IG analyses. The analyses use the total gross weekly family income at age 10 of CMs. It is given in 7 brackets:

1. under 35 pounds per week,

2. CM's self-reported scores at age 16 for malaise and IC have a correlation of about -0.6, and so does the self-reported WEMWB and malaise scores both at age 46.

2. between 35 - 49 pounds per week,

3. between 50 - 99 pounds per week,

4. between 100 - 149 pounds per week,

5. between 150 - 199 pounds per week,

6. between 200 - 249 pounds per week,

7. 250 pounds per week or above.

The mother's malaise score are available when CM was 5, 10, 16 years old. The analysis opted to use the contemporaneous measurement when parental income data is also available. Another option would have been to use more robust measures of malaise by averaging over them (Johnston et al. (2013)).

The CM's log weekly net pay[3] w_t is extracted at age 38; and CM's malaise scores b_{t+1} are available for ages 16, 26, 30, 34, 42, 46. While our analyses looped over CM's malaise scores at various ages, the one at age 34 delivers our baseline result. At ages 34 and 42, the b_{t+1} measure is closest to the date when the CM's wage was measured. At age 34, BCS has a larger number of observations than at age 42, which is to be expected since later waves suffer in general from higher attrition rates.

In practice, our main IG analysis is conducted as follows. b_t is given by a categorical[4] Malaise variable (at CM's age 10), which groups mothers' Malaise scores into a normal behavior category (0-80th percentile), a moderate behavioral problems category (81st to 95th percentile), and a severe behavior problems category (95+ percentile). In this case, the latter two categories define $b_t = b_{tL}$, while the former category defines $b_t = b_{tH}$. To simplify

3. To be exact, w_t is the logarithm of the computed weekly amount of take home pay at age 38.

4. BCS actually provides two variables to describe malaise. A continuous or semi-continuous malaise variable and then a categorical variable that slots malaise into various brackets. While many of our robustness checks used the former, the main text here uses the categorical variables for malaise.

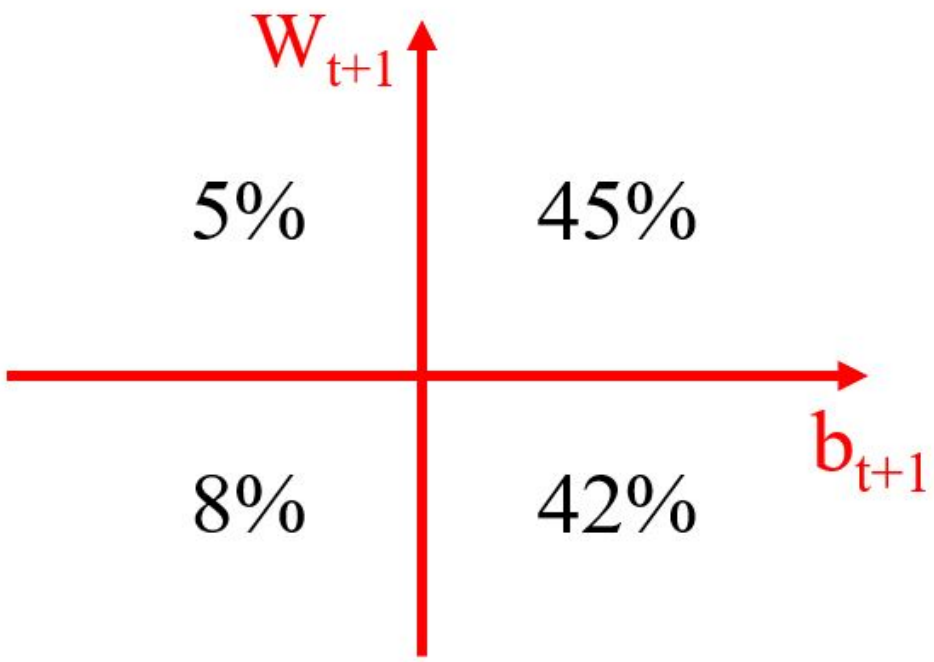
notation, the generational index t is dropped henceforth, with the understanding that High and Low depend on the generational index t or $t+1$. The CM's malaise score b_{t+1} is given by an analogously defined Malaise variable at CM's age 34.[5]

On the other hand, $w_t = w_L$, which denotes a low-wage parent, is defined by a household which earns less than £100 per week at CM's age 10, while $w_t = w_H$ are those households which earn £100 or more per week. In contrast, w_{t+1} does not follow a strict categorization, but its' cutoff is simply defined by the median of the cumulative distribution function of wages at age 38. In other words, w_H (w_L) of the child are defined by being above (below) the median wages of all observed CMs in the 2008 sweep. These definitions are not arbitrary. I follow standard BCS practices and advice from experts in these fields, but I also explore alternatives to these characterizations of the variables in my model. Robustness checks and other definitions of these important variables will be communicated upon request.

Fig. (5.1) shows that children from disadvantaged backgrounds (parental quadrant III) are themselves more likely to end up in disadvantage (child's quadrant III). This can be seen heuristically by comparing the child's coordinate system embedded in parental quadrant III to the baseline distribution for all children. That baseline distribution for all children is obtained irrespective from which parental quadrant the child started out from. Fig. (5.2) displays that baseline distribution for all children. Instead of an overall 8% fraction of children ending up in squalor, when the children start out their lives in parental quadrant III households, they have a 14% probability to end up in squalor themselves. This is a significant increase over the baseline.

5. In fact, b_{t+1} is constructed slightly differently than mother's malaise score. Experts in psychiatry/psychology and psychometrics devised a simple BCS grouping on which we lean on. The BCS grouping goes as follows: those who ticked off a cutoff number of items or more are grouped as high malaise, those beneath that number are deemed low malaise. In contrast to mother's malaise scores, for CM's malaise scores no distributional analyses were conducted by the BCS professionals.

Figure 5.2: Intergenerational Analysis - Baseline Children Outcomes Distribution



A multinomial logit analysis introduces statistical rigor and confirms our heuristic arguments. We classified the parents into their respective parental quadrants, which form our explanatory unordered indicator variables. The dependent, unordered categorical variable is given by the children's quadrants—ranging from quadrant I through quadrant IV. Table 5.2 summarizes our results and confirms that (a) the parental quadrant which describes child's starting point is highly significant, and (b) children starting out in parental quadrant III have a much higher probability to stay in the muck.

Table 5.2: Multinomial Logit Analysis

	Child Quad. II	Child Quad. III	Child Quad. IV
Parental Quad. II	0.498	0.665	0.165
	(0.250)	(0.198)	(0.121)
Parental Quad. III	0.979	1.346	0.755
	(0.280)	(0.213)	(0.146)
Parental Quad. IV	0.388	0.632	0.449
	(0.188)	(0.147)	(0.082)
Constant	-2.495	-2.089	-0.241
	(0.104)	(0.087)	(0.043)

Notes: Baseline is Child Quadrant I. Number of observations is 4040. Pseudo R^2 is 0.0097.

CHAPTER 6

DISCUSSION AND CONCLUSION

This thesis has shown that Intrinsic Capital (IC) is predictive of lifetime outcomes. Specifically, we use data from the British Cohort Study (BCS) to show that IC, an individual's subjective sense of belonging and significance, measured during individual's formative years, performs relatively well in predicting subjective outcomes in adulthood and in childhood. In particular, the predictive power of IC on mental health outcomes is remarkable, especially given the tremendous public health and economic implications of such measures. It is noteworthy that IC matters by about twice as much more than IQ and personality traits combined when studying Wellbeing (46) and a measure of mental distress, Malaise (46). The number in parentheses denotes the age of the Cohort Members when the measure was taken. Our favorite interpretation is that IC conveys significantly more additional and independent information beyond that offered by traditional cognitive and non-cognitive measures.

Since the early childhood years are so important in forming a child's lifestyle—including their developing sense of belonging and significance—the effects of parenting styles were also investigated. Even though IC and parenting style (PS) are both obtained from the child's perspective, some differences in predictive power were observed. Some examples are somewhat attenuated predictive power of PS on measures of wellbeing and life satisfaction in adulthood, and virtually no predictive power of PS on the measure of mental distress at age 46, Malaise (46).

The fact that IC and PS render different results motivated our further investigation into how Well-Being (46) is predicted by IC and PS. An ANOVA analysis revealed several insights. First, that IC is highly significant; second, that PS is also highly significant; and third, that the interaction term is not significant. Regressing Well Being (46) on both IC and PS can now be contemplated without including an interaction term. Clearly IC and PS deliver complementary information on subjective adult outcomes.

For both adult and childhood subjective outcomes, we find that the perspective of the Cohort Member (CM) matters the most—much more than the perspectives of even close, significant adults in their childhood. This result advocates for a unified approach to determine traits consistently—ideally through the eyes of the person whose traits we wish to measure. The mismatch of perspectives beckons us adults to work harder in making our children feel heard and validated.

Motivated by these findings and by Adlerian psychology (Ansbacher and Ansbacher, 1964; Mosak and Maniacci, 2013), we attempt to model the concept of "psychology of use" by leaning heavily on IC. "Psychology of use" refers to how an individual is using their traits, which differs from a "psychology of possession" which takes account of the traits that the individual possesses. Given that Intrinsic Capital was found remarkably important in our analyses, a theory was developed that incorporates IC and traditional economic aspects (e.g., wages) into an intergenerational framework that models transmission of wealth and human capital via parental investments in their children. The theory underscores the importance of IC and, by simply fitting the theory to the available BCS data, it also highlights the prevalence of alarming poverty traps.

Because our work does not involve exogenous variations and therefore cannot claim causal links, the results presented here motivate us to study this further via future RCTs. Adler hypothesized a century ago that mental disorders could be alleviated by improving a person's Gemeinschaftsgefühl, their community feeling. Gemeinschaftsgefühl harbors IC as one of its' important components. Adler's hypothesis proved prescient as a century of vigorous clinical work by Adlerian practitioners attests (Carlson, Watts, and Maniacci, 2006). Albeit using very different investigative tools, Hari (2020) and Seligman (2012) come to similar conclusions. These ideas led me to wonder whether increasing IC through building meaningful relations would improve many children outcomes, such as scores, behaviours, prevalence of mental disorders, etc. One promising avenue to study this would be classroom meetings in

RCT settings. Classroom meetings have the potential to guide students to healthier and more productive social interactions (Dreikurs, Grunwald, and Pepper, 1982; Platt, 1979; Nelsen and Gfroerer, 2017)—thereby giving us a fighting chance to make the world a better place.

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APPENDIX A

ADAM SMITH AND FEEDBACK LOOPS

The concept of a feedback loop is ancient (Mayr, 1970a). It originated more than 2000 years ago by Greek philosopher-scientists. Islamic science referred to and applied these concepts, while the notion of a feedback mechanism was lost to Europeans during the middle ages.

The dawn of the industrial revolution experienced technological advances where the feedback loop was rediscovered. It is remarkable that during that period the concept of the feedback loop was introduced simultaneously into technology and into economic theory (Mayr, 1971). Adam Smith's wide-ranging interests in science and technology must have introduced him to these concepts of feedback loops in technology—witness his youthful paper on the history of astronomy and his friendships with scientists, mathematicians, and James Watt (Mayr, 1971).

Mayr posits that Adam Smith's fluency and competence in applying feedback loops into the economic discipline must have occurred after he absorbed its simpler manifestations in various technological applications. Then Smith masterfully introduced these into economic reasoning. An indication that his thoughts may indeed have evolved in this fashion, may be gleamed from Smith's early writing:

Systems in many respects resemble machines. A machine is a little system, created to perform, as well as to connect together, in reality, those different movements and effects which the artist has occasion for. A system is an imaginary machine invented to connect together in the fancy those different movements and effects which are already in reality performed. The machines that are first invented to perform any particular movement are always the most complex, and succeeding artists generally discover that, with fewer wheels, with fewer principles of motion, than had originally been employed, the same effects may be more easily produced. The first systems, in the same manner, are always the most complex, and a connecting chain, or principle, is generally thought necessary to unite every two seemingly

disjointed appearances; but it often happens, that one great connecting principle is afterwards found to be sufficient to bind together all the discordant phenomena that occur in a whole species of things. (Thomson, 1965)

Adam Smith was enamored with these self-regulating mechanisms that the concept of a feedback loop attained almost a life of its own in the Wealth of Nations (Mayr (1971)). In the Wealth of Nations, there are at least three examples of social feedback mechanisms:

- the mechanism that gives rise to compensations in various occupations
- the self-regulating nature of the labor population
- supply and demand.

Smith's applications of the feedback concept surpassed greatly the contributions of his contemporaries, including the single contribution of feedback to economic thought made by his friend David Hume (Mayr, 1971). Given Smith's penchant in applying insights gained in one discipline to others (Thomson, 1965), it should not surprise us that Smith would come to appreciate social interactions (sympathy and fellow-feeling) as dynamic social feedback loops (Otteson, 2018; Sugden, 2002). Otteson discerns a feedback loop in Smith's concepts of mutual sympathy and good judgment:

What constitutes appropriate accommodations that any of us should make can fall, however, only within reasonable parameters. And, crucially for Smith, we always retain the ability—in some cases, perhaps even the duty, as when the impartial spectator requires it—to break from others' expectations. This is the second part of Smith's conception of self-command. The desire for mutual sympathy of sentiments means that the default becomes to comport with others' expectations, and our ability to exercise self-command indicates our relative ability to do so. Yet as adults we can also choose when not to comply with others' expectations. This is Smith's psychological, moral, and, ultimately, political libertarianism. Now, knowing when to comply and when to defect is not easy. It is a function of good

judgment, which Smith, following Aristotle, believes is a skill that must be practiced to be effective. But practice alone is not enough. We must also have feedback, and this feedback must actually have some purchase on us. That is precisely the role that the desire for mutual sympathy of sentiments plays. When others do not enter into our sentiments, it generates a displeasure in us—we cannot escape that. But what we can do is select those opportune moments when the displeasure is worth it—when, that is, some other good (perhaps compliance instead with our imagined impartial spectator) outweighs the cost of failing to achieve mutual sympathy of sentiments with actual spectators. Every morally mature person of good judgment deliberately distances himself from potential instances of mutual sympathy of sentiments at various times in his life. It is often difficult to know when we should do so, and we often get it wrong. But we possess the ability to choose to depart from others' expectations, and virtue will require that we do so in many circumstances throughout our lives.

(Otteson (2018), p. 245-246)

Then there is Smith's criticism directed at centralized legislators who do not understand as well the social intricacies (peculiarities) of local communities. Smith believed that local communities would be better off, if we were to trust in the self-regulating qualities of the invisible hand as applied to social interactions (Otteson, 2018). The notion of an invisible hand is, after all, a type of self-regulating mechanism, an example of feedback. As for a refreshing view that argues for the centrality of fellow-feeling in Smith's moral philosophy, and potential feedback loops arising under that framework, please see Sugden (2002).

As for Adam Smith's philosophy of human nature, Sugden rather convincingly argues that Smith's ideas were larger than what neo-classical economic thought was able to incorporate. There are inherent limitations in rational choice theory in that it does not model accurately human beings in their vast complexities and in their psychologies. This dissonance later gave rise to the ascendancy of behavioral economics. But behavioral economics was anticipated centuries earlier by Adam Smith who did not lose sight of the infinite human complexity, and

of the bonds that nurture and sustain one another via fellow-feeling and sympathy which go beyond any rational reason, but are built into the very essence of who we are, social creatures to the core:

When by natural principles we are led to advance those ends, which a refined and enlightened reason would recommend to us, we are very apt to impute to that reason, as to their efficient cause, the sentiments and actions by which we advance those ends, and to imagine that to be the wisdom of man, which in reality is the wisdom of G'd.

(TMS, pages 126-127)

APPENDIX B

ITEM SELECTION

We discussed at length with experts the construction of each of our concepts introduced in this thesis. We spent a great deal of time on some items to make sure our concept constructions are as sound as can be. Each item has been carefully analyzed so as to minimize the expected signal to noise ratio. To offer the reader a flavor of our deliberations consider the "Is often disobedient" item appearing in IC(16, mom). Here we faced the dilemma of whether this item perchance informs about mother's autocratic tendencies (autocratic parenting style) or about the child's sense of being commandeered around (manipulated) by their parents (relevant for IC($\cdot$, mom)). In consultation with experts, we removed the item for the younger ages at 5 and 10 years, because an autocratic mother would see even healthy resistance by her child as disobedience and because we wanted to avoid mechanical linkages between autocratic parenting and IC.

However, we included this item at age 16 in creating IC(16, mom), because, as psychologists and educators assured us, age 16 is a rather tumultuous period in many an adolescent's life with strong striving towards independence in evidence—experienced by many of their parents as rebelliousness. In that instance—i.e., at age 16—this item offers more of an insight in the way the child expresses their sense of belonging and significance than revealing parental autocratic tendencies. We therefore kept it for the age 16 wave. There were occasions when our and the experts' intuitions were missing the target. Beyond our many consultations with the experts and beyond our own thoughts on these matters, the actual data disciplined our constructions in some instances.

APPENDIX C

ADDITIONAL MEASURES

Maternal Parenting Styles - Age 5:

The parenting styles as seen by mother at age 5 are discussed here. Each item is a 5-valued Likert scale ranging from "Strongly agree" to "Strongly disagree". Maternal responses were evaluated in analogy to the strategy described in footnote 5 of Chapter 2 (with "Cannot say" replacing the "Neutral" response).

Mothers were prompted with the following preamble before starting the survey: *This section asks for your opinion about a wide range of subjects. Please give your own opinions and do not worry about what others may think. There are no "correct" answers to the questions. We expect you will agree with some statements and disagree with others.*

Autocratic Parenting Style - Age 5 - Mother

- Such activities as painting and playing should take second place to teaching, reading and arithmetic in infant schools.
- If a child is often allowed to have his own way while he is young, he will be uncontrollable later.
- Increases in vandalism and delinquency are largely due to the fact that children nowadays lack strict discipline.
- Children should not be allowed to talk at the meal table.
- Children under five should always accept what their parents say as being true.
- One of the things parents must do is sort out their children's quarrels for them and decide who is right and wrong.
- A mother who always gives in to her young child's demands for attention will spoil him.
- If pre-school children would pay more attention to what they are told instead of just having their own ideas they would learn more quickly.
- A child should not be allowed to talk back to his parents.
- There are many things a 5-year-old child must do with no explanation from his parents.
- It is not surprising if educational standards are falling when children have so much freedom in school nowadays.

- You cannot expect a child under five to understand how another person feels.
- A well brought up child is one who does not have to be told twice to do something.

Democratic Parenting Style - Age 5 - Mother

- It's best not to visit children under five in hospital because it is too upsetting for the child.
- A person that [*sic*] does not let others stand in his way is to be admired.
- Children should not be allowed to talk at the meal table.
- If pre-school children would pay more attention to what they are told instead of just having their own ideas they would learn more quickly.
- There are many things a 5-year-old child must do with no explanation from his parents.
- You cannot expect a child under five to understand how another person feels.
- Children who get upset whilst in hospital soon get over it afterwards.

Permissive Parenting Style - Age 5 - Mother

- Such activities as painting and playing should take second place to teaching, reading and arithmetic in infant schools.
- If a child is often allowed to have his own way while he is young he will be uncontrollable later.
- Increases in vandalism and delinquency are largely due to the fact that children nowadays lack strict discipline.
- Children under five should always accept what their parents say as being true.
- It is unreasonable to expect hospitals to upset their routine by allowing unlimited visiting in children's wards.
- Young children pick up a lot of bad habits from T.V.
- One of the things parents must do is sort out their children's quarrels for them and decide who is right and wrong.
- A mother who always gives in to her young child's demands for attention will spoil him.
- A child should not be allowed to talk back to his parents.
- It is not surprising if educational standards are falling when children have so much freedom in school nowadays.
- A well brought up child is one who does not have to be told twice to do something.
- Children under five should never be allowed to watch adult T.V.

The BCS used mother's responses to derive a variable called "Authoritarian child rearing" (variable D124G) which correlates very highly (-0.93) with our measure of maternal autocratic PS. We embraced this fact as a vote of confidence in our methodology. We kept our factor analysis for consistency with the other maternal PS measures.

Teaching Styles - Age 10 - Teacher

We also constructed Autocratic and Democratic Teaching Styles from teacher's responses at age 10. These could prove useful for investigating teacher's influences on the CMs in their classrooms.

Further Measures of Well-Being (age 46)

- Role limitations due to emotional problems
- Sleep
  - Average time it takes to fall asleep.
  - Average number of hours of sleep had per night over the last 4 weeks.
  - Frequency of waking and having trouble falling back asleep in last 4 weeks.
  - Frequency of getting enough sleep to feel rested on waking in last 4 weeks.

Satisfaction with Life, Job, Relationship (age 46)

- Job Satisfaction
  - Satisfaction with current job
  - Whether has choice in deciding how to do work?
  - Whether has choice in deciding what to do at work?
  - Whether job provides variety of interesting things?
- Work-life balance satisfaction
- Relationship satisfaction
- Satisfaction with partner's work-life balance
- Leisure activities/chores [hobbies and time spent on these]

Social Life (age 46)

- Social functioning score
- Frequency of meeting up with friends
- Frequency of meeting up with family members
- Support system
- Socializing in clubs, societies, or organizations
- Voting
- Criminal conduct
- Optimism[1]
- Trust

Health (age 46)

- Objective health measures
  - Blood pressure
  - BMI (measured by nurse)
  - Blood tests
  - Death
- Self-reported
  - BMI
  - General Health (several items: some of which are themselves scores from multiple items)
  - Disability
  - Pain Score
  - Energy/Fatigue Score
  - Role limitations due to physical health
  - Physical Functioning Score
  - Drinking problems
  - General health compared to one year ago
  - Health problems since last interview
  - Self rating of general health a year ago

Education/Income (mostly at age 46)

1. Our very rudimentary measure for optimism is "Expected life satisfaction in 10 years time" minus "Life satisfaction".

- Lifetime income
- Wages (age 38)
- Education
- Cognitive Functioning

APPENDIX D

MOTHER-CHILD RELATIONSHIPS AND PARENTING STYLES

The BCS provides data to buttress the claim made in Section 3.2 that Democratic PS is the most suited to capture the idiosyncratic sense of belonging and significance of the CM. We use the Symmetry In Interests measure as an opportunity to assess the relationship between mother and child (i.e., CM). We argue that a 16-year-old knows their mother's interests well—including her order of priorities. While the mother lists her interests in order of importance for teenagers, the CM also faces the 49 questions themselves, see Figure D.1. We reason that an antagonistic relationship would be indicated if whatever mother deems important is given a thumb's down by her child. In the other extreme, we argue that complete overlap between mother's prioritized items and child's interests would indicate full alignment in interests.

Figure D.1: Interests

MY INTERESTS

5K

INSTRUCTIONS

Here you will find a list of health topics. We want to ask you to tell us for each health topic whether you are very *interested, quite interested, not sure,* or *not interested at all.*

We have labelled below an example to show you exactly how to do this.

EXAMPLE

HEALTH TOPIC	ANSWER			
	Very interested (a)	Quite interested (b)	Not sure (c)	Not interested at all (d)
How interested are you in: Health Education?	☐	■	☐	☐

Answer (b) means that you are quite interested (but not very interested) to know more about health education.

Please now turn to page 6 of the Student Score Form. On that page, in section 5K you will find a set of lozenges headed (a), (b), (c) and (d). Record in these lozenges your answers to each of the list of health topics 1–49 which are on *this* page. You should answer by filling in one of the lozenges (a), (b), (c), (d) or (e), in a similar way to the example above on this page. *Remember* not to put your answers in this Test booklet, but in the Student Score Form. Fill in *one lozenge only* in answer to each health topic.

KEEP THIS PAGE OPEN, LOOK AT THE FIRST HEALTH TOPIC No. 1 AND THEN FILL IN YOUR ANSWERS ON PAGE 6 OF THE STUDENT SCORE FORM. THEN PROCEED TO NUMBER 2 . . . AND SO ON.

LIST OF HEALTH TOPICS

How interested are you in:

1. How the body works. (C5K1)
2. Staying well. (C5K2)
3. Immunisation. (C5K3)
4. Illness and recovery (C5K4)
5. Talking with Doctors, Nurses and Dentists. (C5K5)
6. Care of hair, teeth, skin (C5K6)
7. Care of eyes. (C5K7)
8. Care of feet. (C5K8)
9. Human reproduction. (C5K9)
10. Menstruation (periods) (C5K10)
11. Food and Health. (C5K11)
12. Drinking alcohol (C5K12)
13. Glue-sniffing. (C5K13)
14. Smoking. (C5K14)
15. Physical fitness. (C5K15)
16. Understanding the needs of handicapped people. (C5K16)
17. Understanding the needs of old people. (C5K17)
18. Health and social services. (C5K18)
19. Safety at home. (C5K19)
20. Safety in traffic. (C5K20)
21. Water safety. (C5K21)
22. First aid. (C5K22)
23. Family life. (C5K23)
24. Separation from parents (C5K24)
25. Death and bereavement. (C5K25)
26. Stress and relaxation. (C5K26)
27. The difference between boys' behaviour and girls' behaviour. (C5K27)
28. Normal growth and development. (C5K28)
29. Relationships with other boys and girls of the same age. (C5K29)
30. Understanding people of different race or religion. (C5K30)
31. Feelings (love, hate, anger, jealousy). (C5K31)
32. Bullying. (C5K32)
33. Building self-confidence. (C5K33)
34. Making decisions (C5K34)
35. Honesty. (C5K35)
36. Responsibility for your own behaviour. (C5K36)
37. Spare-time activities. (C5K37)
38. Boredom. (C5K38)
39. Caring for pets. (C5K39)
40. Vandalism. (C5K40)
41. Stealing. (C5K41)
42. Pollution. (C5K42)
43. Conservation. (C5K43)
44. Contraception. (C5K44)
45. Parenthood and child care. (C5K45)
46. Sexually transmitted diseases (C5K46)
47. Control of body weight (C5K47)
48. Violence on the television screen. (C5K48)
49. Cancer. (C5K49)

The actual items as shown to the CMs when 16 years old. The CMs were asked to indicate their level of interest for each of these 49 items. The identical 49 items were presented to the CMs' mothers in a separate questionnaire.

Our initial hypothesis was that children raised in intense autocratic environments would disproportionately rebel and be antagonistically inclined towards their parents. This would

be reflected in a low SII measure. The opposite relationship between autocratic PS and SII has been observed. In extreme autocratic environments, the children tend to not go against their parental interests, see Figure D.2.[1] Each dot is displayed with a 20% opacity in Figures D.2-D.4. Thus darker dots represent multiple overlapping observations. One interpretation is that these children have been so browbeaten by their parent that they don't even know what their own interests are. In contrast, intense democratic PS encourages the child to follow their own interests—even if at odds with mother's interests (see Figure D.3). This then suggests that democratic PS is better suited to probe the idiosyncratic sense of b & s of individuals. In contrast, children experiencing an intense autocratic PS, would inform only about b & s under autocratic regimes—thereby severely limiting the probing of the myriad ways IC could be experienced.

1. When these scatter plots are shown separately for each of the three IC tertiles, the effects are even more pronounced. For kids in the highest IC tertile (High IC) the South-East region in the SII versus Autocratic PS is even less populated. Our interpretation is that these kids feel that they belong in this autocratic environment and learned to accommodate (perhaps even internalize?) the whims of their autocratic parent. We will share these plots upon request.

Figure D.2: Symmetry in Interests - Autocratic PS (Age 16)

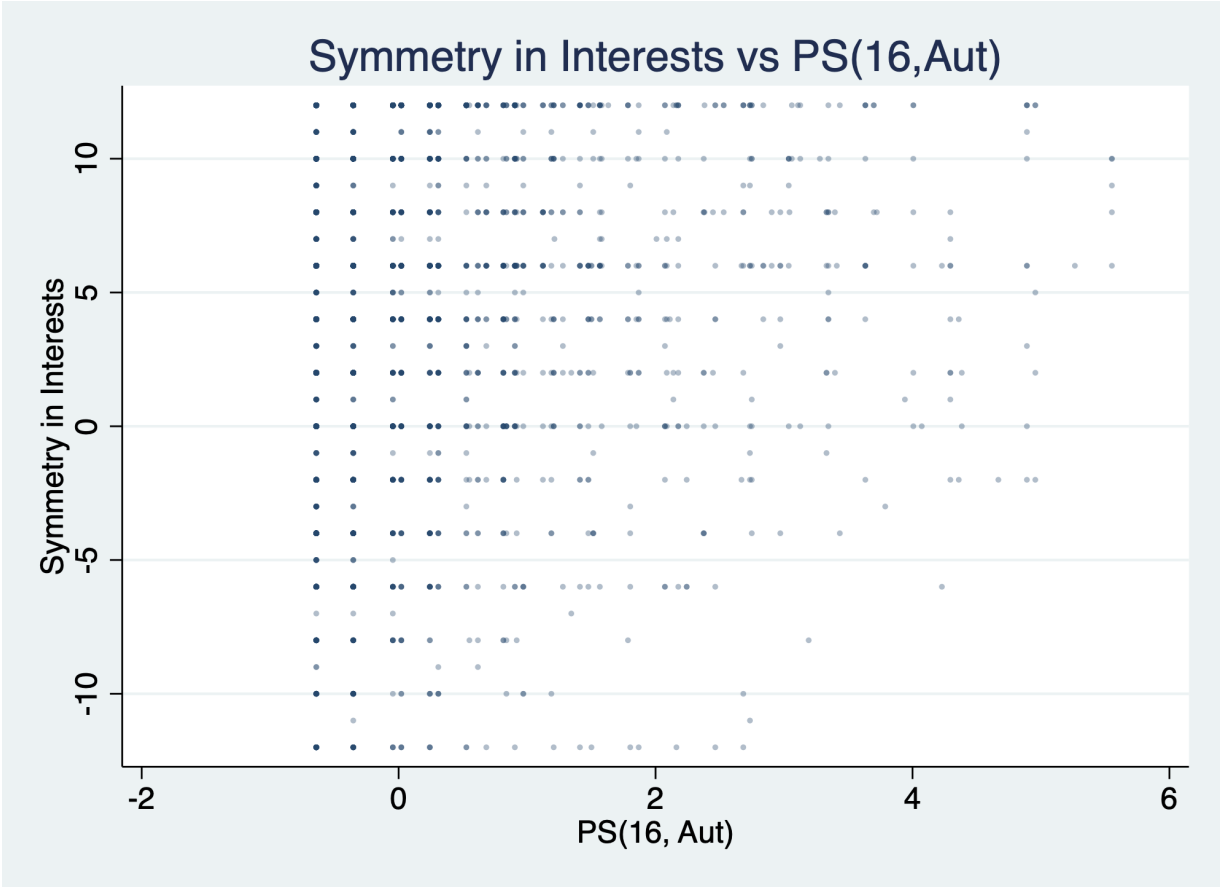

Figure D.3: Symmetry in Interests - Democratic PS (Age 16)

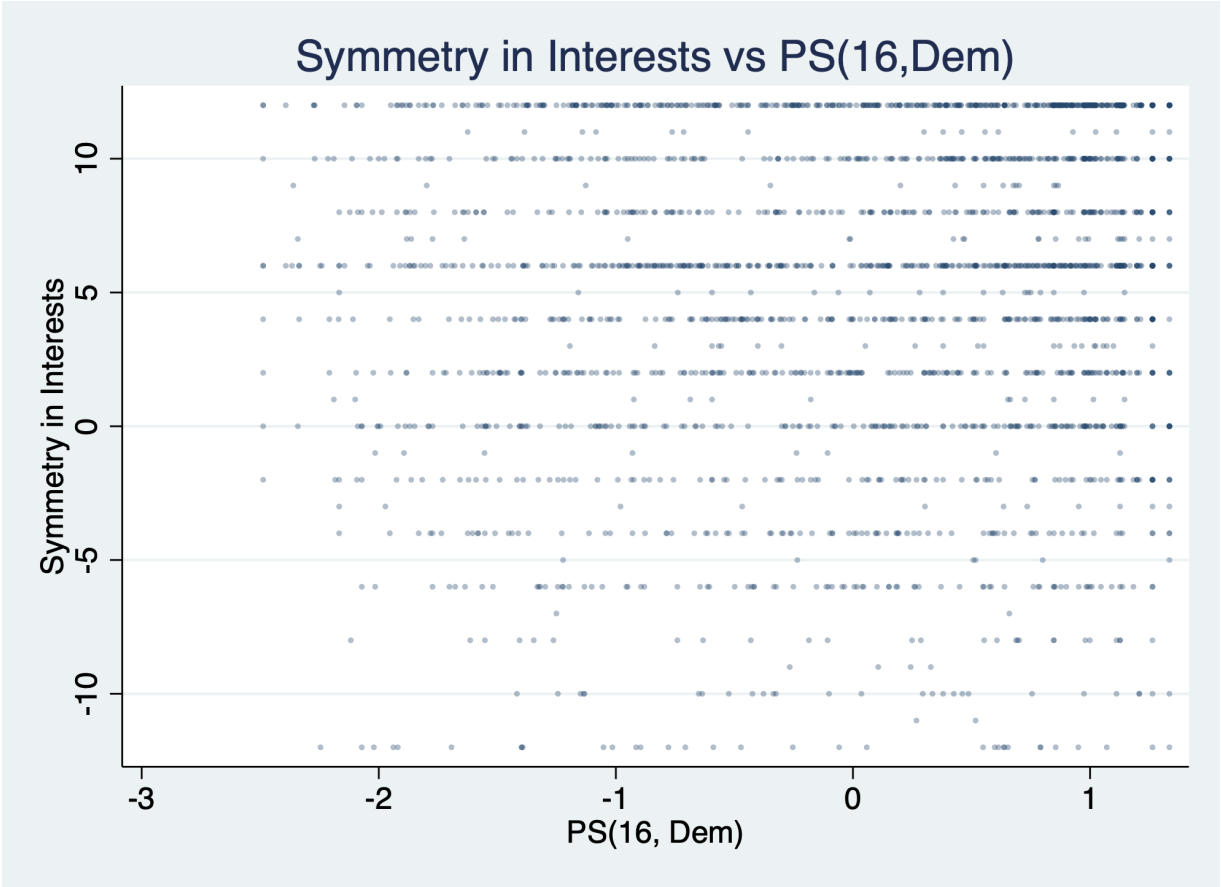

Figure D.4: Symmetry in Interests - Permissive PS (Age 16)