

A Social-Cognitive Approach to the Socioeconomic Gap in Achievement:

The Effects of Growing up in Economically Challenging Environment on Self-Efficacy, Problem-Focused Coping Potential and Attribution of Success and Failure

by

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Summary

Despite numerous attempts to reduce socioeconomic disparity in education, the gap in educational attainment and expectations among students with different socioeconomic backgrounds persists. This thesis is an attempt to extend our understanding of the social-psychological mechanisms that could explain this gap and inform solutions that would promote greater equality in education. It presents three manuscripts, which together propose that (1) the link between socioeconomic background and educational attainment can be explained by self-efficacy beliefs, and (2) childhood socioeconomic status and self-efficacy bias the process of judgement that precedes achievement-oriented behaviour. Building on the existing literature and research, in the first study I assess the roles of self-efficacy antecedents in the relationship between socioeconomic background and educational expectations. The findings demonstrate that self-efficacy antecedents fully explain the effects of income, social class, and primary caregiver's education on educational expectations of students. Further, in a theoretical piece, I propose that pre-existing self-efficacy beliefs guide the selection and interpretation of the immediate information relevant in the process of appraisal of problem-focused coping potential. Finally, building on the results of the first study and the proposed theoretical framework, I test the effects of childhood status on the appraisal of coping potential and attribution of the outcome when people solve cognitive tasks. The findings demonstrate that the effect of childhood status varies across tasks with different difficulty and among people who succeeded and failed. I situate these findings within broader research on socioeconomic disparity in education and discuss their implications for theory, research, and practice.

Keywords: socioeconomic gap in educational achievement, educational expectations, self-efficacy beliefs, appraisal of problem-focused coping potential, attribution of success and failure, self-serving bias

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General Introduction

Growing up in economically challenging circumstances has long been linked with a variety of negative outcomes for individuals' health, wealth, and well-being. The effects of socioeconomic environment in childhood are pervasive – they span over the years and across different domains of life, ranging from intimate relationships to the professional sphere. Early-life experiences of economic disadvantage put a child in a disadvantaged position early on and never truly let go.

Research shows that being born into a poor family often means staying poor for life (Bird, 2013; Jenkins & Siedler, 2012). These findings indicate a lack of upward social mobility, the reproduction of social inequality and an inability of those growing up in disadvantaged environments to change their socioeconomic status during the course of their life. It means that social lifts that are meant to ensure social mobility and allow those who grow up in economically challenging circumstances to break the cycle of disadvantage might not be working properly.

One such social lift is education. Consequently, one of the central mechanisms explaining the lack of social mobility is unequal access to and participation in education (Brown, 2013; Brown et al., 2013; Haveman & Smeeding, 2006). Despite numerous attempts to reduce the socioeconomic gap in educational attainment, this gap persists to this day. In fact, research has shown a global increase in the socioeconomic achievement gap between 1964 and 2015 (Chmielewski, 2019). Importantly, the lack of achievement among those coming from low socioeconomic backgrounds seems to be internalised by children growing up in disadvantaged environments and is reflected in their lower educational expectations and career aspirations. For instance, economically challenged children as young as 13 years old have lower educational expectations compared to their more well-off counterparts (Smyth, 2018).

It is our task as social scientists to understand and explain why this is the case and help develop solutions that would empower those who grow up in economically challenging environments. This would allow them to realise their potential and break the cycle of poverty. Building on existing research, this thesis attempts to extend our understanding of the mechanisms underlying the effects of early-life economic disadvantage on educational achievement. Specifically, I link growing up in an economically challenging environment with the development of low self-efficacy beliefs. When one is faced with a challenging situation,

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these beliefs guide the selection and interpretation of the immediate information about the situation and one's chances to succeed. This process results in one's assessments of their problem-focused coping potential – a perceived capability to successfully deal with a challenge at hand. Appraisal of problem-focused coping potential, in turn, gives rise to an emotional experience and behavioural response. For instance, people who appraise their problem-focused coping potential as lower would be more likely to feel disengaged, set less ambitious goals and give up more quickly. This would likely result in lower levels of achievement.

This process is described and illustrated in three manuscripts. The first manuscript presents a study that explores the roles of self-efficacy antecedents in the relationship between socioeconomic background and educational expectations of 13-year-old secondary school students. Its findings suggest that self-efficacy antecedents fully explain the effects of family income, social class, and primary caregiver's education on educational expectations. The second manuscript digs deeper into the role of pre-existing self-efficacy beliefs in the process of appraisal of problem-focused coping potential. It presents a theoretical framework specifying the mechanism underlying the effect of self-efficacy beliefs on problem-focused coping potential, and the conditions that moderate the predictive power of self-efficacy. The third manuscript builds on the proposed theoretical framework. It tests the effects of childhood socioeconomic status on the appraisal of problem-focused coping potential and attribution of the outcome across situations in which people solve cognitive tasks with different difficulty. It also assesses the mediating role of self-efficacy in these effects.

Before getting into the specifics of the three manuscripts mentioned above, I propose to take a broader look at the link between economic disadvantage and educational attainment and review existing research that aimed to explain this link. This will allow for a better understanding of the relevance of this thesis, and help situate the findings within the existing literature, and thus see where its unique contribution is. In the following section, I review sociological and psychological models and research relevant to our understanding of the socioeconomic gap in achievement. Sociological literature is represented by status attainment theory – perhaps the most influential framework focused on the process underlying one's achievement of their position in the society and underscoring the importance of socioeconomic background in this process. Psychological literature is represented by research emphasizing the significance of early-life environment in the development of cognitive processes that play

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a central role in academic performance and achievement. Finally, the third strand of research is represented in both sociological and psychological literature and is centred around maladaptive beliefs about one's agency, control and competence that are shaped by the socialisation in less advantaged circumstances.

Existing Explanations of the Socioeconomic Disparity in Educational Achievement

Sociological Explanation: Status Attainment Models

Social mobility has always been of critical interest to sociologists. Several influential accounts on the matter have been produced, including the theory of social and cultural capital (Bourdieu, 1986). Another influential approach to the explanation of social mobility process is status attainment theory (Blau & Duncan, 1967; Haller & Portes, 1973; Sewell & Shah, 1968; Sewell & Hauser, 1972), which I discuss in greater detail due to its more social-psychological orientation and relevance of its assumptions to the main questions and objectives of this dissertation.

Status attainment theory was put forward in an attempt to explain how people attain their statuses and move upward or downward on the social ladder. It aimed to extend the theory and research on social stratification and move further from simply reporting and comparing social mobility rates to explaining the processes standing behind these rates. Two models – Blau and Duncan's model (Blau & Duncan, 1967) and Wisconsin model (Sewell & Shah, 1968; Sewell & Hauser, 1972) – were developed within the status attainment theory. While Blau-Duncan model focused on the structure of status transmission, the Wisconsin model centred around the social-psychological mechanisms linking parental influences and individual attainment.

Blau and Duncan's model was guided by the question "To what degree does the ascribed position relate to subsequent attainment?" Using cross-sectional data, they observed that the ascribed position expressed in fathers' occupational success had a direct influence on their sons' educational and occupational aspirations and subsequent attainment. Sewell's Wisconsin model extended these findings by analysing panel data and including information about one's academic performance in the model, as an additional source of occupational aspirations. Like Blau and Duncan, he found that the influence of family background was significant. In addition to that, he demonstrated that this influence was mediated by parental

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encouragement and school performance that acted as predictors of both educational and occupational aspirations and actual attainment (Sewell & Hauser, 1972). Together, the two models demonstrated that psychological variables – educational and occupational aspirations – play a key role in status attainment. According to the authors of the models, these psychological variables are shaped early on as a combination of interpersonal influences (e.g., encouragement from significant others) and information about one’s ability.

An important assumption of status attainment models relates to the formation of educational expectations – one of the central constructs of these models. Specifically, educational expectations are thought to be formed relatively early on and to represent a static mental construct. That means that expectations become crystalised at a young age and are not particularly affected by any influences that might take place later in life. That proposition has been questioned in the past (see, for instance, Bayesian learning theory [Andrew & Hauser, 2011; Breen, 1999]); however, the data show that although expectations can change, they are indeed relatively stable (Andrew & Hauser, 2011). This underscores the importance of early-life environment and experiences to the development of educational expectations and consequent academic achievement.

From the moment status attainment theory was introduced in the sociological literature, a large body of research on educational attainment have relied on the theoretical assumptions of the theory. Over the years, researchers have extended the pioneering models with the addition of other factors predicting educational outcomes of students. For instance, it was found that such factors as engagement in extracurricular activities (Kaufman & Gabler, 2004; Mahoney et al., 2003; Otto, 1967), school liking and learning approaches (Kremer et al., 2019), and even personality traits (Grosz et al., 2020), all contribute to the development of educational expectations. Importantly, most of these factors are also influenced by socioeconomic background.

Open Questions. Despite their important contribution to our understanding of the link between family socioeconomic background and educational outcomes, status attainment models have some constraints. The central one, in my opinion, is that although these models were thought to reveal social-psychological mechanisms underlying status attainment, they fail to deliver on this. Specifically, the authors of these models usually view a child as a passive recipient of outside influences, rather than as an engaged participant who actively learns from the

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environment, integrates her experiences into mental representations and relies on them in her future judgements, decisions and behaviours. Although educational expectations represent a social-cognitive construct that is likely influenced by such mental representations, the mechanisms underlying their formation are not addressed by status attainment models. Investigating these mechanisms would allow the design of more nuanced solutions aimed at reducing the socioeconomic gap in educational attainment and provide more insight into why educational expectations are so stable and why the effects of family background persist in later life.

In addition, empirical tests of status attainment models have rarely included a variety of measures representing socioeconomic background. A lack of differentiation between different socioeconomic indicators might limit our understanding of the mechanisms explaining the link between socioeconomic conditions and psychological variables. Furthermore, research relying on status attainment models has been primarily concentrated in North America. Individual experiences associated with socioeconomic conditions are not independent of the social structure of the society people live in (i.e., economic disadvantage might be experienced differently in countries with different levels of economic inequality, extent of welfare state, attitudes toward the working class and attributions of poverty). Thus, any generalizations regarding the effects of socioeconomic conditions across contexts are a matter of empirical scrutiny.

Neurocognitive Explanation: Early-Life Economic Environment and Cognitive Development

The neurocognitive explanation centres around the effects of child poverty on executive function, and often, on the mediating role of stress in this relationship. It draws on a large body of research addressing questions of how different aspects of early-life experiences of economic disadvantage, such as, for instance, nutrition, stress experienced by parents, quality of the interaction between parents and their children, or cognitive stimulation, contribute to the development of executive function. Typically, this research concludes that factors associated with poverty hinder the development of executive function, which, in turn, is responsible for the achievement gap. Moreover, the effects of child poverty on executive function usually persist in later life. I discuss some of this research in more detail.

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Researchers have found that those who grew up in disadvantaged socioeconomic environments experience higher levels of both psychophysiological and subjective stress (Evans, 2004; Evans & English, 2002; Evans & Kim, 2012; Evans & Schamberg, 2009). High levels of stress experienced in early childhood may impact the development of brain and executive function. Past research has found that experiencing elevated levels of cortisol and epinephrine in childhood, when brain systems are more malleable, can change the brain architecture making the stress response system more sensitive and thus reacting at lower levels of stressful stimuli in the future (Hackman et al., 2010; Pechtel & Pizzagalli, 2011). Studies have also shown that stress associated with childhood poverty influences brain development, in particular brain systems responsible for executive function (Farah et al., 2006; Hackman et al., 2010; Hackman & Farah, 2009). For instance, Farah et al. (2006) have found significant differences between poor and non-poor children in the activation and function of the prefrontal cortex and the anterior cingulate cortex, responsible for working memory and cognitive control, respectively.

Working memory capacity and executive control are often regarded as central elements of academic success (Alloway & Alloway, 2010; Nutley & Söderqvist, 2017; Lechuga, Pelegrina, Pelaez, Martin-Puga, & Justicia, 2016). Those with lower executive control find it more difficult to concentrate, are usually less likely to defer immediate gratification, tend to externalize problems, and actively express their negative emotions (Rueda et al., 2005). All these factors contribute to lower academic performance. Furthermore, executive control is associated with attention deficit disorders, which are associated with underperformance (Barry et al., 2002; Daley & Birchwood, 2010; Taanila et al., 2014).

Open Questions. Research within the “cognitive development” perspective is mainly centred around deficits in executive function emphasizing primarily technical aspects of the process of self-regulation in economically challenged children. Although these factors play a crucial role in academic achievement, they only tell part of the story. This perspective does not account for the psychological phenomena and processes that do not rely so heavily on executive function, but which can also be highly impactful for one’s decisions, behaviours, and subsequent success. The cognitive development perspective does not ask how deficits in executive function associated with growing up in an economically challenged family makes one feel, or how it impacts their self-perception. Its constraints are thus similar to the constraints of status attainment models in that subjective interpretation of experiences (e.g. lower executive function and associated

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underperformance) is not accounted for. Such interpretation and resulting beliefs (for instance, competence beliefs and self-concept) are, however, likely to influence decisions, behaviours, and subsequent academic success too. In fact, researchers have been increasingly speaking about the importance of the so-called “non-cognitive” skills and processes in academic achievement; with some accounts suggesting that this group of factors can predict performance and achievement over and above cognitive ability (Cobb-Clark & Tan, 2011; Farkas, 2003; Heckman & Rubinstein, 2001; Lleras, 2008).

Social-Psychological¹ Explanation: Socioeconomic Background and Maladaptive Beliefs and Attitudes

This explanation is concerned with the effects of economic disadvantage on the development of maladaptive beliefs about control, personal mastery and competence. One of the first approaches that features such beliefs was the “culture of poverty” (Lewis, 1966), which suggested that fatalism, lack of control over life, dependency, apathy and low civic participation are typical of those living in poverty (Lewis, 1966). It is suggested that these features are passed from one generation to the next one and are limiting to one’s chances to escape their disadvantage. The approach has often been criticised as blaming the poor and serving the interests of the rich more so than describing the problem of economic disadvantage (Carr, 2003; Coward et al., 1974).

In the following years, scholars have continued to link socialisation in low socioeconomic status families with the adoption of fatalistic beliefs, external locus of control and lack of perceived competence (Cidade et al., 2016; Gomez & Beachum, 2019; Greene & Murdock, 2013; Kane, 1987; Lever et al., 2005; Lewis, 1966; Rabow et al., 1983). They suggested that these maladaptive beliefs might be responsible for the lower aspirations and achievement among the poor, and thus contribute to the intergenerational transmission of economic disadvantage.

Open Questions. Despite making an important contribution to the research on the psychological effects of economic disadvantage, past research within this perspective has rarely explored mechanisms that would explain how these rather abstract beliefs actualise in

¹ This explanation is derived from sociological literature. I follow the terminology chosen by the authors, however, it is important to note that this explanation is predominantly focused on individual differences that, as authors suggest, develop as a function of experiences of poverty and economic disadvantage.

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specific behaviours. In fact, there are criticisms of using such abstract phenomena as predictors of behaviour (e.g., Bandura, 1997). Given the breadth and abstractness of beliefs that are usually linked with economic disadvantage, it is unlikely that their effects on behaviours are direct. It is more probable that these effects are mediated by more specific judgements, which are formed in situations when behaviours take place. Furthermore, the judgements preceding behaviours are shaped under the influence of potentially many different factors, of which beliefs are just one. Thus, it is important to account for the interaction of beliefs with other factors. Such an approach would allow for a more refined understanding of the mechanism that underlies the roles of socioeconomic background and associated beliefs in decisions and behaviours.

Additionally, the literature that links socioeconomic status with a set of control and competence beliefs is rarely very specific regarding the age at which economic disadvantage was experienced. It is an important issue, as beliefs represent stable individual differences that are not likely to change much once formed. Thus, it is more likely that childhood environment and experiences are more influential in their development. Literature and research on the effects of socioeconomic disadvantage need to be clearer and more specific on this matter, as it has important implications regarding the timing of interventions targeting such beliefs.

Addressing the Existing Knowledge Gaps in the Research on the Link between Socioeconomic Background and Educational Achievement: The Scope of the Present Dissertation Research

In an attempt to extend our understanding of the mechanism underlying the relationship between economic disadvantage and educational expectations, this dissertation takes a social-cognitive approach to the analysis of the experiences of economic disadvantage. I build on all three perspectives discussed above and attempt to address the open questions and constraints of each of them. So, following social-psychological perspective, I link socioeconomic background with the development of stable beliefs about one's ability to be in control of their lives and cope with challenges – self-efficacy beliefs. I suggest that the lack of mastery experiences that results from the deficit in executive function (as suggested by research within the neurocognitive perspective), parents' expectations regarding their children's future life chances (as observed by status attainment theorists), and children's observations of peers and

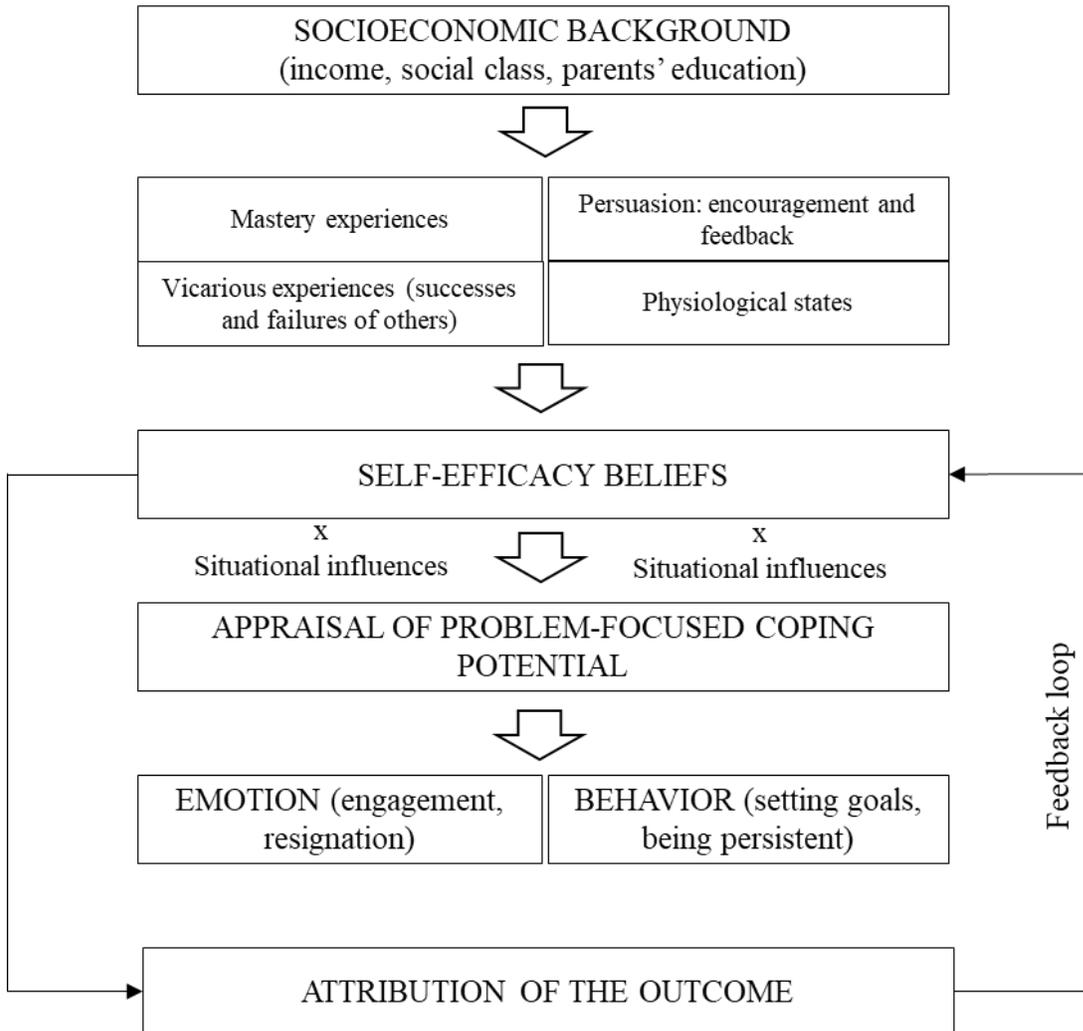
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experiences at school (interacting with teachers) predispose children from lower socioeconomic status families to develop lower self-efficacy beliefs. Once formed, these beliefs act as a cognitive bias in the process of appraisal of problem-solving coping potential – a situational judgement of capability – and, via appraisal, guide cognition, emotion, and behaviour. For example, low self-efficacy beliefs and appraisal of problem-solving coping potential would likely lead one to experience higher levels of disengagement and resignation, set less ambitious goals and be less persistent at working towards those goals, and as a consequence, to underachieve. In addition, I argue that childhood socioeconomic status and self-efficacy beliefs also influence how individuals interpret the outcomes of their actions, with those coming from lower status backgrounds being more likely to explain their successes with external factors (e.g., chance), and failure with internal stable factors (e.g., ability). Biased attribution processes are what explains why self-efficacy beliefs are so stable and not likely to change a lot, and why the effects of childhood socioeconomic status may persist in later life. The model depicting this process is presented in Figure II.

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Figure I1

The Mechanism Underlying the Effects of Socioeconomic Background on Achievement



I attempt to address the previously discussed gaps in the following ways. First, by focusing on self-efficacy beliefs, appraisals of problem-focused coping potential and attributions, I introduce the element of subjective interpretation of personal experiences of economic disadvantage, which status attainment models and the neurocognitive perspective do not feature. Second, I acknowledge that the effects of childhood socioeconomic status and associated self-efficacy beliefs are not independent of the situation in which the appraisal, achievement-oriented behaviour and attribution of the outcome of this behaviour take place, and that other factors might interact with those influences, which was not typically a part of discussion in the literature presenting the social-psychological perspective. I account for this

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empirically, by testing the interaction effects of childhood socioeconomic status with immediate information about the situation. Furthermore, in both empirical studies, I explicitly focus on childhood as a period that is, I believe, the most significant to the development of self-efficacy beliefs. Finally, in the first empirical study, I account for the complexity of socioeconomic background and differentiate between four distinct factors comprising family background – income, social class, and the education of primary and secondary caregivers.

Main Predictions

1. All aspects of socioeconomic background play significant roles in the educational expectations of students. Students from high-income and high social class families where parents have higher levels of education form higher educational expectations.
2. Self-efficacy antecedents at least partially explain the effects of socioeconomic background on educational expectations of students. Students coming from higher status families form higher educational expectations as a function of (1) their better school performance, (2) attending a school with lower proportion of underachieving students, (3) receiving more positive feedback from their teachers, and (4) being encouraged to plan to go to college by their parents.
3. Childhood socioeconomic status positively affects the appraisal of problem-focused coping potential at dealing with a challenging situation, however, only in ambiguous situations when the information about the probability to succeed is inconclusive. The effect is likely nonsignificant in unambiguous situations (i.e., when the task at hand is either too easy or exceedingly difficult).
4. Childhood socioeconomic status is positively associated with attributing success to internal stable factors and failure to external factors, however, this association is significant only in ambiguous situations. In situations when the task at hand is either too easy or exceedingly difficult, all participants, regardless of their status and pre-existing self-efficacy beliefs, would likely make more external attributions.
5. Higher self-efficacy beliefs among those with higher childhood socioeconomic status at least partially explain the positive effects of childhood socioeconomic status on appraisal and tendency to make more internal attributions for success and more external for failure.

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Brief Overview of the Three Manuscripts

Manuscript 1. The first manuscript focuses on the link between socioeconomic background and educational expectations, and the potential of three groups of self-efficacy antecedents to explain this link. It mainly contributes to the literature and research on status attainment. In this study, I differentiate between different aspects of socioeconomic background (family income, social class, primary and secondary caregivers' education), which allows for a more nuanced understanding of socioeconomic background effects. Furthermore, I introduce diminished sense of self-efficacy as one of the consequences of the socialisation in economically challenging environments and argue that using self-efficacy theory as a framework allows for a better understanding of the social-psychological mechanisms underlying status attainment.

Manuscript 2. This manuscript presents a theoretical piece that (1) outlines how self-efficacy beliefs – a stable individual difference – inform the appraisal of problem-focused coping potential via a range of selection processes and (2) specifies the conditions that make the role of self-efficacy in appraisal more or less significant. The manuscript provides an overview of two main psychological theories that are central to this dissertation – self-efficacy theory and appraisal theory. Additionally, in this manuscript, I deal with the issues related to the conceptualisation of self-efficacy. Overall, the manuscript provides a solid theoretical framework for the second study that is presented in Manuscript 3.

Manuscript 3. The third manuscript presents an empirical investigation of the effects of childhood socioeconomic status on the appraisal of problem-focused coping potential at dealing with a cognitive task and attribution of the success versus failure at this task. I assess the effects of childhood socioeconomic status on the appraisal in the situation of solving a cognitive task. In addition to the main effects of childhood socioeconomic status, I am interested in how it interacts with situational factors – the difficulty of the task and experience with the task (success or failure attempting to solve it). I also assess the effects of childhood socioeconomic status on emotional states theoretically associated with the appraisal of problem-focused coping potential. The manuscript thus presents a refined empirical test of the overall theoretical model proposed in this dissertation.

Manuscript 1. Exploring the Gap in Educational Expectations along the Socioeconomic Divide: The Role of Self-Efficacy Antecedents²

Disparity in educational outcomes among students coming from different socioeconomic backgrounds has been documented by a large body of interdisciplinary research. Crucially, this disparity is expressed not only in actual attainment of students, but also in their educational expectations (Goyette, 2008; Parker et al., 2016; Reynolds & Johnson, 2011). As educational expectations have a potential to inform goals and their implementation strategies, planning and self-regulation, and thus influence actual attainment through a range of cognitive and behavioural processes, knowing what explains the differences in educational expectations between students coming from less and more well-off families could inform solutions aimed at narrowing the attainment gap and creating more equality in education for socially disadvantaged children. This becomes an even more relevant task in light of the current COVID-19 pandemic, which, according to recent reports (Aucejo et al., 2020; Dorn et al., 2020), already have and will likely continue to put students from underprivileged families at an even bigger disadvantage. Researchers inside and outside of academia have been discussing that the measures implemented globally to contain the virus spread are likely to contribute to widening of the income-achievement gap.

Although we know that students coming from economically challenged families and those with more privileged backgrounds differ on a range of factors that inform educational expectations (see Smyth, 2018), past research has rarely directly tested whether these differences can fully explain the link between family socioeconomic background and students' educational expectations. Thus, while it is safe to assume that aggregate social influences, e.g., academic performance, parents' attitudes, and school experiences, explain the effect of family background on educational expectations of students, a direct test is required to better understand the mechanisms behind the formation of such educational expectations.

In our study we aimed to explore the role of different sets of factors previously linked with the formation of educational expectations, examining the relationship between family economic disadvantage and educational expectations of 13-year-old secondary school students.

² With Sonja Drobic. Olga Poluektova conceived the original idea of the study, analysed the data, wrote up the first version of the manuscript, prepared the manuscript for submission to the journal. Both authors contributed to the design of the study, interpretation of the results, writing, and revising the manuscript. The Manuscript is currently under review in *Social Forces*.

We use self-efficacy theory (Bandura, 1977; 1997) as the main conceptual framework for this study, suggesting that students coming from families with lower socioeconomic status are likely to develop lower self-efficacy – one’s perceived capability to be successful in pursuit of a challenging goal (in this case, educational attainment). We link each indicator of socioeconomic status with one of three groups of self-efficacy antecedents – performance accomplishments, social persuasion, and vicarious experience – and argue that the gap in educational expectations between children from less and more well-off families can be explained by the differences in self-efficacy antecedents. We test this proposition using the data from the “Growing Up in Ireland” project, a longitudinal survey of 8500 children in the Republic of Ireland.

Before turning to the specifics of our study, we briefly review the literature on the formation of educational expectations of students. Further, we introduce self-efficacy as a possible explanation for the differences in educational expectations between students coming from families with lower and higher socioeconomic background. We present various ways in which one’s experiences associated with the socioeconomic background might influence the development of self-efficacy. Finally, we put forward a model that is further tested in our study.

Students’ Socioeconomic Background and Their Educational Expectations

Educational expectations have been long used in sociological research to better understand the status attainment model depicting the processes by which family background (dis)advantages are perpetuated across generations. More than half a century ago, the so called Wisconsin model (see Haller & Portes, 1973; Sewell & Hauser, 1972) sought to specify the causal sequence through which individuals reach their positions in status hierarchies. It was heavily social-psychological in orientation, invoking family and school-based socialisation processes as the principal mechanisms linking social origins with status positions in adulthood. The answer to the question why higher-status youths attain higher educational and occupational levels was found in young people's plans, as captured and expressed in educational expectations and occupational aspirations. Also, more recent studies on status attainment from a life course developmental perspective lent strong support to the model’s core proposition that academic performance and significant others' influence shape educational expectations (Bozick et al., 2010).

Andrew and Hauser (2011) examined whether educational expectations are driven by a static mental construct as a result of early formation based on family background and social influences or the students mostly adapt their educational expectations in light of recurring information about their academic potential, as hypothesized in research based on Bayesian learning theory (Breen, 1999). Although they found that students' expectations do not derive from a static mental construct and that they can change, they concluded that students adapt their educational expectations rather modestly and only when the changes in grade point averages were exceptionally large (Andrew & Hauser, 2011). Thus, adolescent educational expectations stabilize early and are rather persistent over time. Moreover, adolescents from higher socioeconomic status families are much more likely to hold onto high educational expectations, both in the early years after high school and, for those who do not earn degrees within that period, through their 20s (Johnson & Reynolds, 2013).

Still, research mostly focuses on confirming the importance of educational expectations for educational achievement, and not on the mechanisms underlying the formation of educational expectations. Andrew and Hauser (2011) set up the objective to examine how students actually formulate their educational expectations and educational decision-making, but in effect they focused on the adopt-adapt debate: do students adopt educational expectations early on from social influences determined by their social background or do they adapt their expectations based on new and pertinent information about their educational success. This is, however, unlikely an either/or question, as the information about one's educational success is not independent of his or her socioeconomic background. It is more plausible that socioeconomic background pre-empts what kind of information about the educational success one receives, and through this information exerts influence on educational expectations. We propose that this process can be best illustrated with the help of self-efficacy theory.

Self-Efficacy as a Possible Mediator in the Relationship between Socioeconomic Background and Educational Expectations

Self-efficacy refers to individuals' perceptions of their capabilities to exert influence over the events in their lives. It develops as a function of four groups of antecedents – performance accomplishments, vicarious experiences, persuasive information, and

physiological states (Bandura, 1977; 1997). People with high self-efficacy approach difficult tasks as challenges to be mastered and are likely to succeed at them, while people with low self-efficacy view difficulties as threats to be avoided and thus become more likely to fail when dealing with difficulties (Bandura, 1997). Self-efficacy has been extensively used in academic contexts and educational settings (Klassen & Usher, 2010; Lent, Brown, & Larkin, 1984; Multon, Brown, & Lent, 1991; Zimmerman, Bandura, & Martinez-Pons, 1992) and was found to be an important predictor of academic performance and attainment.

Existing literature points to a host of mechanisms that can help explain how poverty and economic disadvantage contribute to the development of lower self-efficacy beliefs. For instance, due to the lack of financial resources and the lower levels of education among less well-off parents, the environments in which disadvantaged children grow up are less cognitively stimulating (Brooks-Gunn & Duncan, 1997; Rosen et al., 2020). Specifically, children from poorer families are usually exposed to a less diverse vocabulary (e.g., Rowe, 2018) and are less frequently engaged in the process of active learning by their caregivers (Arnold et al., 2008; Duncan et al., 1994; Mistry & Wadsworth, 2011). This results in them being less prepared for school (Chazan-Cohen et al., 2009), having more difficulties in learning, and underperforming on standardized tests (Hair et al., 2015). Altogether, this may predispose children from economically challenged families to gain fewer mastery experiences than their peers from better-off families.

Another mechanism relates to the vicarious experiences – the behaviours of the significant others that children model as they grow up (Bandura, 1977; 1997). Their siblings, being brought up in the same environment, are also likely to underachieve. In addition, they are more likely to live in poor neighbourhoods (Anderson et al., 2014; Leventhal & Brooks-Gunn, 2000) and go to school where the share of underachievers is higher (Hochschild, 2003). Being exposed to those environments is likely to inform children's ideas of themselves as being less capable.

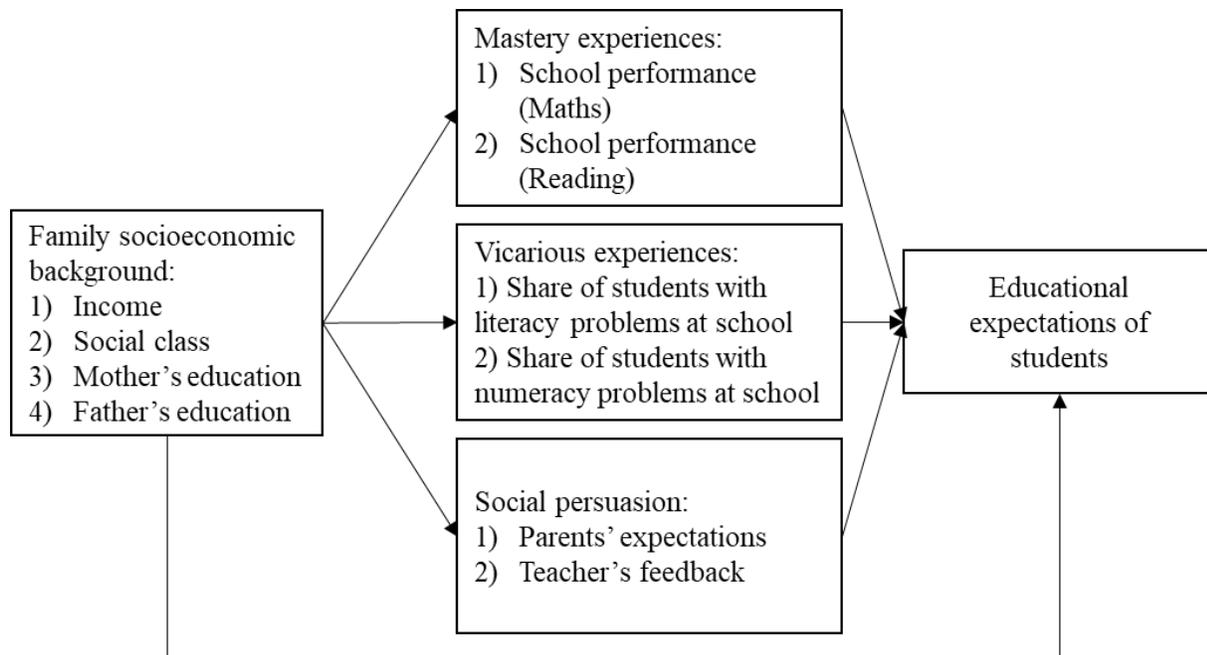
Finally, children develop their competence beliefs as a function of being exposed to persuasive information within social context (Bandura 1977; 1997). Children from less well-off families are exposed to more negative information than their peers in more well-off families. For instance, research has shown that poorer parents generally have lower expectations and aspirations regarding their children's future (Kirk, Lewis-Moss, Nilsen, & Colvin, 2011;

Sewell & Shah, 1968; Smyth, 2018) and that there is a certain degree of bias in teachers’ attitudes and interactions with children coming from different economic backgrounds (Pit-ten Cate & Glock, 2018). Additionally, the general negative societal attitudes toward lower social classes and attributions of poverty transmitted through the media are likely to contribute to children’s beliefs about themselves when they develop systems of social categorisation and start identifying with different social groups.

Based on the arguments we outlined in this section, we suggest that family socioeconomic background influences educational expectations of students through three groups of self-efficacy antecedents: one’s own mastery experiences, vicarious experiences, and persuasive information (Figure M1.1). Based on the available data, we operationalize mastery experiences as children’s performance at standardized tests in Math and reading at age 9. Vicarious experiences are operationalized through the share of students with literacy and numeracy problems at the child’s school. Persuasive information is measured by primary caregiver’s expectations regarding future attainment of the child and praise (or its absence) that the child receives from the teacher at school. We include parents’ education, social class, and income as indicators of family socioeconomic background.

Figure M1.1

The Effects of Family Socioeconomic Background on Educational Expectations of Students



Method

Data

We use the data from the second wave of “Growing Up in Ireland” survey, a government-funded study of children in Ireland that follows the progress of two age groups: 8,000 9-year-olds (Child Cohort/Cohort '98) and 10,000 9-month-olds (Infant Cohort/Cohort '08). The participants in our research come from a representative sample of 7,525 children in the Child Cohort who were born between November 1997 and October 1998, are residents of the Republic of Ireland, and were 9 and 13 years old when they were interviewed in the first two waves of the study. A two-stage design was adopted to collect a representative sample of the national population of nine-year-old children. At the first stage a random sample of primary schools was recruited and at the second stage a sample of nine-year-old children was selected from the sample of schools. The sample represented approximately 14% or about one in every seven of the nine-year-old residents in The Republic of Ireland. In the second wave of the study, no additions were made to the sample, with the only loss being through non-response or attrition. Therefore, the population of Wave 2 is the population of initially nine-year old children (and their families) who continued to be residents in Ireland in Wave 2. In addition to children themselves, their primary and secondary caregivers, their teachers, and the principals of the schools they attended were interviewed. Full details on the study can be found at: <https://www.esri.ie/growing-up-in-ireland> (Murray et al., 2010; Thornton et al., 2016).

Variables

Independent Variables and Potential Mediators

Family socioeconomic variables included family income, social class, and educational levels of primary (mostly mothers) and secondary (mostly fathers) caregivers. We transformed socioeconomic variables in order to facilitate the interpretation of results. This was achieved by reducing the number of response categories. Family income refers to the yearly net income per family member. We created and used a variable with three levels: low income (lowest income quintile), middle income (three middle quintiles), and high income (highest income quintile). Social class was derived from primary and secondary caregivers' occupation. In the database, it was represented by a classification adopted and used by the Irish Central Statistics

Office, with seven categories: (1) professional managers, (2) managerial and technical professionals, (3) non-manual, (4) skilled manual, (5) semi-skilled, (6) unskilled, (7) all others gainfully occupied and unknown. We recoded the social class variable in the following way. We combined the first two categories into *highly skilled professionals*, non-manual and skilled manual into *skilled working class*, and semi-skilled and unskilled into *semi-skilled and unskilled working class*. We excluded seventh category from the analysis. Primary and secondary caregivers' education was represented by six categories: (1) Primary school or less, (2) Intermediate/Junior/Group Certificate or equivalent, (3) Leaving Certificate of Equivalent, (4) Diploma/ Certificate, (5) Primary Degree, (6) Postgraduate/ Higher Degree. We recoded education variable into the variable with four categories: Primary school or less, Junior Certificate, Leaving Certificate or Vocational Training, and University Degree.

Students' mastery experiences were operationalized as the students' scores on standardized Drumcondra tests in Math and English/Irish reading in primary school when children were 9 years of age. Persuasive information was represented by primary caregiver's expectations regarding their children's educational attainment in the future (1 = Not expecting that a child will earn a university degree in the future; 2 = Expecting that the child will earn a university degree in the future) at Wave 2, and children's self-reports of the frequency of positive feedback they receive from their teacher at Wave 2 (1 = Never, 2 = Sometimes, 3 = Often). Vicarious experiences were represented by the share of students with literacy and numeracy problems at the child's school. In the second wave of Growing Up in Ireland, school principals were interviewed. Among other things, they were asked to report on the proportion of pupils in the school that have literacy and numeracy problems that adversely impact on their educational development (1 = Less than 10%, 2 = 10 to 25%, 3 = More than 25%).

Dependent variable

The expectations of students regarding their future educational attainment at Wave 2 were assessed by the question: What is the highest qualification you expect to get by the time you finish your education? The dependent variable has two levels: (1) Not expecting to earn a university degree in the future, (2) Expecting to earn a university degree in the future.

Control variables

Several control variables have been included in the model: child's gender, presence of learning difficulties, and the immigration status of the family.

Analytical strategy

Given that the main research question is focused on the mechanism that would help explain the relationship between family socioeconomic background and educational expectation of students, the appropriate choice of analytical strategy would be mediation. In this study, we followed the approach to mediation proposed by Baron and Kenny (1986). At the first step, we tested the effects of family background variables (family income, social class, primary and secondary caregivers' education) on educational expectations of students. At the second step, we tested the effects of family socioeconomic background variables on our hypothesized mediators, i.e., self-efficacy antecedents (mastery experiences, persuasive information, and vicarious experiences). Finally, at the last step, we tested the effect of family socioeconomic background on educational expectations of students, controlling for self-efficacy antecedents to detect whether the effect would remain significant, and if yes, which attributes of family socioeconomic background would be responsible for this effect. We entered groups of variables in the model in the following order: (1) social and demographic variables and the presence-absence of a learning difficulty, (2) child's mastery experiences, (3) vicarious experiences, (4) persuasive information, (5) family socioeconomic background.

We ran binomial logistic regression for the cases where the dependent variable was dichotomous, ordinal logistic regression for the cases where the dependent variable was measured on an ordinal scale, and linear regression for the cases where the dependent variable was measured on a continuous scale. Each model included control variables: child gender, immigrant status of the family, and presence or absence of a range of learning difficulties. These control variables are likely to affect educational expectations of students and are also likely to be related to family socioeconomic background.

Results

Descriptive analysis showed that 55.4% of students expect to earn a university degree in the future. As predicted, expectations differ among students with different socioeconomic

background. Only 43.5% of students coming from families in the lowest income quintile expect to graduate from the university, as opposed to 66.1% of those coming from families at the top 20% income distribution (Table M1A1). Descriptive statistics for all variables can be found in the Appendix. Specifically, table M1A2 presents descriptive data for the main independent (social background) variables. Table M1A3 outlines descriptive data for the mediating variables (self-efficacy antecedents). Tables M1A4 and M1A5 present descriptive data for control variables that we used in all further analyses. Table M1A4 combines social and demographic factors, while table M1A5 gives insight into the developmental conditions that might impact the process of learning and educational expectations of both parents' and students themselves. We present total and income split for all variables. Overall, the descriptive data suggests that students' coming from more and less well-off families differ in terms of what kind of schools they attend, how they perform at school, and what their parents expect from them.

At the first stage of our main analysis, we conducted a series of binomial logistic regression analysis with students' educational expectations predicted on socioeconomic background variables. At first, we entered all predictors independently (the results are presented in Table M1A6). Further, socioeconomic background variables (income, social class, and parents' education) were entered in the model at one step to estimate the effect of each of them when all others are held constant (no multicollinearity or autocorrelation was detected). The results revealed that, except income, all facets of family socioeconomic background (social class, primary and secondary caregivers' education) were significant predictors of students' educational expectations (Table M1.1). Students whose parents belonged to semi- or unskilled working class were less likely to expect to earn a university degree compared to those whose parents identified as highly skilled professionals. The expectations of students coming from skilled working-class families did not significantly differ from those of students coming from families where parents were highly skilled professionals. Students' whose primary and secondary caregivers had a university degree were significantly more likely to expect to earn a university degree in the future compared to those whose parents did not graduate from the university. For example, the odds of students whose secondary caregiver only completed primary school were only 0.36 times the odds of students coming from a family with a university-educated secondary caregiver.

Table M1.1

Children’s Educational Expectations Regressed on Family Socioeconomic Background. Binomial Logistic Regression (Odds Ratios and 95% Confidence Intervals)

| | Children’s Educational Expectations |
|---|-------------------------------------|
| Family socioeconomic background | |
| Income | |
| Lowest 20% | 0.924 (0.777; 1.019) |
| Highest 20% | 1.135 (0.984; 1.310) |
| (Ref.: Middle 60%) | |
| Social class | |
| Semi- or unskilled working class | 0.745* (0.594; 0.935) |
| Skilled working class | 0.887 (0.771; 1.019) |
| (Ref.: Highly skilled professionals) | |
| Primary caregiver’s education | |
| Primary or less | 0.458*** (0.291; 0.719) |
| Junior Certificate | 0.673*** (0.575; 0.788) |
| Leaving Certificate/Diploma | 0.766** (0.650; 0.902) |
| (Ref.: University Degree) | |
| Secondary caregiver’s education | |
| Primary or less | 0.357*** (0.255; 0.500) |
| Junior Certificate | 0.594*** (0.508; 0.695) |
| Leaving Certificate/Diploma | 0.821* (0.683; 0.988) |
| (Ref.: University Degree) | |
| Control variables | |
| Child gender – Female | 1.168** (1.043; 1.307) |
| Primary caregiver born outside of Ireland | 1.097 (0.924; 1.303) |
| Secondary caregiver born outside of Ireland | 1.109 (0.931; 1.322) |
| Child born outside of Ireland | 0.875 (0.706; 1.084) |
| Child diagnosed with a learning disability | 0.465*** (0.371; 0.584) |
| Child diagnosed with an autism spectrum disorder | 0.549 (0.291; 1.039) |
| Child diagnosed with an emotional or behavioural disorder | 0.616 (0.335; 1.134) |
| Child having a speech or language difficulty | 0.903 (0.568; 1.437) |
| Child making slow progress | 0.300** (0.151; 0.599) |

Note. Model with control variables only (not presented): Pseudo $R^2_N = 0.027$, $\chi^2(9) = 110$, $p < .001$.

Model with control variables + socioeconomic background: Pseudo $R^2_N = 0.087$, $\chi^2(19) = 358$, $p < .001$.

Models comparison: $\chi^2(10) = 247$, $p < .001$.

VIF and Tolerance statistics did not indicate multicollinearity.

*** $p < .001$, ** $p < .01$, * $p < .05$.

At the next stage of the analysis, we assessed the effects of socioeconomic background variables on the three groups of self-efficacy antecedents – the hypothesized mediators. The results revealed that socioeconomic background had a significant impact on all self-efficacy antecedents. Lower income, social class, and parents’ education had a significant negative effect on students’ performance on standardized tests in reading and Math (Table M1.2). Lower socioeconomic background also positively predicted whether the child was attending a school

with a higher share of students with literacy and numeracy problems (Table M1.3). Finally, the results have shown that parents' expectations were influenced by all socioeconomic background variables (Table M1.4). Furthermore, children received less positive feedback from the teacher if the secondary caregiver's education was lower than the university degree. Income, social class, and primary caregiver's education were not significantly related to the likelihood of the child receiving positive feedback from his/her teacher.

Having confirmed that socioeconomic background significantly predicted both students' educational expectations and self-efficacy antecedents, we fitted a binary logistic regression model predicting students' educational expectations with socioeconomic background variables controlling for self-efficacy antecedents. We were interested in whether the effects of socioeconomic background variables would still be significant after self-efficacy antecedents were accounted for. The analysis revealed that each group of self-efficacy antecedents was a significant contributor to students' educational expectations; however, of all socioeconomic background variables, only secondary caregiver's education (mostly fathers) consistently remained a highly significant predictor of students' educational expectations (Table M1.5). This suggests that self-efficacy antecedents fully mediated the positive effects of income, social class, and primary caregiver's education on students' educational expectations, and partially the effects of secondary caregiver's expectations.

Table M1.2

Mastery Experiences Regressed on Family Socioeconomic Background. Multiple Linear Regression (Standardized regression coefficients and 95% Confidence Intervals)

| | Reading Performance at Age 9 | Math Performance at Age 9 |
|---|--------------------------------|--------------------------------|
| Family socioeconomic background | | |
| Income | | |
| Lowest 20% | -0.09* (-0.16; -0.02) | -0.05 (-0.13; -0.02) |
| Highest 20% | 0.11** (0.05; 0.17) | 0.10** (0.04; 0.14) |
| (Ref.: Middle 60%) | | |
| Social class | | |
| Semi- or unskilled working class | -0.27*** (-0.37; -0.17) | -0.28*** (-0.39; -0.18) |
| Skilled working class | -0.18*** (-0.24; -0.12) | -0.12*** (-0.18; -0.06) |
| (Ref.: Highly skilled professionals) | | |
| Primary caregiver's education | | |
| Primary or less | -0.75*** (-0.94; -0.56) | -0.64*** (-0.84; -0.45) |
| Junior Certificate | -0.25*** (-0.31; -0.18) | -0.20*** (-0.27; -0.13) |
| Leaving Certificate/Diploma | -0.13*** (-0.31; -0.06) | -0.06 (-0.14; 0.01) |
| (Ref.: University Degree) | | |
| Secondary caregiver's education | | |
| Primary or less | -0.43*** (-0.57; -0.29) | -0.33*** (-0.47; -0.18) |
| Junior Certificate | -0.19*** (-0.26; -0.12) | -0.18*** (-0.25; -0.11) |
| Leaving Certificate/Diploma | -0.18*** (-0.26; -0.11) | -0.14*** (-0.22; -0.06) |
| (Ref.: University Degree) | | |
| Control variables | | |
| Child gender – Female | -0.04 (-0.09; 0.01) | -0.20*** (-0.25; -0.15) |
| Primary caregiver born outside of Ireland | -0.08* (-0.15; -0.01) | -0.05 (-0.12; 0.03) |
| Secondary caregiver born outside of Ireland | -0.10* (-0.18; -0.02) | -0.08* (-0.16; -0.01) |
| Child born outside of Ireland | -0.08 (-0.17; 0.01) | -0.04 (-0.13; 0.05) |
| Child diagnosed with a learning disability | -1.13*** (-1.23; -1.04) | -0.76*** (-0.86; -0.66) |
| Child diagnosed with an autism spectrum disorder | 0.02 (-0.25; 0.28) | -0.19 (-0.47; 0.09) |
| Child diagnosed with an emotional or behavioural disorder | -0.20 (-0.44; 0.05) | -0.45*** (-0.71; -0.19) |
| Child having a speech or language difficulty | -0.25* (-0.44; -0.06) | -0.34** (-0.54; -0.14) |
| Child making slow progress | -0.64*** (-0.87; -0.40) | -0.59*** (-0.84; -0.35) |

Note. **Reading performance at age 9**

Model with control variables only (not presented): $R^2 = 0.115$, $F(9, 5453) = 77.5$, $p < .001$.

Model with control variables + socioeconomic background: $R^2 = 0.203$, $F(19, 5443) = 71.8$, $p < .001$.

$\Delta R^2 = .088$, $F(10, 5443) = 59.1$, $p < .001$.

Math performance at age 9

Model with control variables only (not presented): $R^2 = 0.073$, $F(9, 5453) = 47.4$, $p < .001$.

Model with control variables + socioeconomic background: $R^2 = 0.135$, $F(19, 5443) = 44.5$, $p < .001$.

$\Delta R^2 = .062$, $F(10, 5443) = 38.8$, $p < .001$.

VIF and Tolerance statistics did not indicate multicollinearity.

*** $p < .001$, ** $p < .01$, * $p < .05$.

Table M1.3

Vicarious Experiences Regressed on Family Socioeconomic Background. Ordinal Logistic Regression (Odds Ratios and 95% Confidence Intervals)

| | Share of Students with Literacy Problems | Share of Students with Numeracy Problems |
|---|---|---|
| Family socioeconomic background | | |
| Income | | |
| Lowest 20% | 1.34*** (1.13; 1.57) | 1.48* (1.19; 1.66) |
| Highest 20% | 0.81** (0.71; 0.93) | 0.78*** (0.68; 0.90) |
| (Ref.: Middle 60%) | | |
| Social class | | |
| Semi- or unskilled working class | 1.46*** (1.17; 1.82) | 1.40** (1.12; 1.75) |
| Skilled working class | 1.23** (1.08; 1.41) | 1.21** (1.05; 1.38) |
| (Ref.: Highly skilled professionals) | | |
| Primary caregiver's education | | |
| Primary or less | 2.02*** (1.33; 3.08) | 2.28*** (1.49; 3.51) |
| Junior Certificate | 1.15 (0.99; 1.33) | 1.20* (1.03; 1.39) |
| Leaving Certificate/Diploma | 1.06 (0.90; 1.23) | 1.07 (0.92; 1.25) |
| (Ref.: University Degree) | | |
| Secondary caregiver's education | | |
| Primary or less | 1.42* (1.04; 1.94) | 1.38* (1.01; 1.86) |
| Junior Certificate | 1.28*** (1.10; 1.48) | 1.45*** (1.24; 1.67) |
| Leaving Certificate/Diploma | 1.27** (1.07; 1.52) | 1.32** (1.10; 1.56) |
| (Ref.: University Degree) | | |
| Control variables | | |
| Child gender – Female | 0.76*** (0.69; 0.85) | 0.76*** (0.68; 0.84) |
| Primary caregiver born outside of Ireland | 1.15 (0.98; 1.35) | 1.13 (0.95; 1.33) |
| Secondary caregiver born outside of Ireland | 1.16 (0.98; 1.37) | 1.20* (1.02; 1.42) |
| Child born outside of Ireland | 0.84 (0.68; 1.03) | 0.94 (0.77; 1.15) |
| Child diagnosed with a learning disability | 1.23 (1.00; 1.52) | 1.31* (1.06; 1.62) |
| Child diagnosed with an autism spectrum disorder | 1.17 (0.66; 2.07) | 1.37 (0.78; 2.43) |
| Child diagnosed with an emotional or behavioural disorder | 1.40 (0.82; 2.38) | 1.15 (0.67; 1.98) |
| Child having a speech or language difficulty | 1.21 (0.78; 1.87) | 1.16 (0.74; 1.80) |
| Child making slow progress | 1.75* (1.01; 3.06) | 1.89* (1.08; 3.33) |

Note. **Share of students with literacy problems at child's school**

Model with control variables only (not presented): Pseudo $R^2_N = 0.007$, $\chi^2(9) = 52.1$, $p < .001$.

Model with control variables + socioeconomic background: $R^2_N = 0.030$, $\chi^2(19) = 216.8$, $p < .001$.

Models comparison: $\chi^2(10) = 165$, $p < .001$.

Share of students with numeracy problems at child's school

Model with control variables only (not presented): Pseudo $R^2_N = 0.007$, $\chi^2(9) = 54.4$, $p < .001$.

Model with control variables + socioeconomic background: $R^2_N = 0.038$, $\chi^2(19) = 275.1$, $p < .001$.

Models comparison: $\chi^2(10) = 221$, $p < .001$.

*** $p < .001$, ** $p < .01$, * $p < .05$.

Table M1.4

Persuasive Information Regressed on Family Socioeconomic Background. Binomial Logistic Regression and Ordinal Logistic Regression (Odds Ratios and 95% Confidence Intervals)

| | Primary Caregiver's expectations | Teacher's Feedback |
|---|----------------------------------|-----------------------------|
| Family socioeconomic background | | |
| Income | | |
| Lowest 20% | 0.76** (0.63; 0.93) | 0.92 (0.79; 1.07) |
| Highest 20% | 1.60*** (1.22; 2.11) | 1.12 (0.96; 1.31) |
| (Ref.: Middle 60%) | | |
| Social class | | |
| Semi- or unskilled working class | 0.66** (0.50; 0.89) | 0.98 (0.84; 1.14) |
| Skilled working class | 0.76** (0.63; 0.93) | 1.05 (0.82; 1.35) |
| (Ref.: Highly skilled professionals) | | |
| Primary caregiver's education | | |
| Primary or less | 0.18*** (0.11; 0.31) | 0.99 (0.62; 1.61) |
| Junior Certificate | 0.26*** (0.19; 0.35) | 0.90 (0.76; 1.08) |
| Leaving Certificate/Diploma | 0.43*** (0.31; 0.60) | 0.84 (0.71; 1.01) |
| (Ref.: University Degree) | | |
| Secondary caregiver's education | | |
| Primary or less | 0.27*** (0.17; 0.42) | 0.64** (0.45; 0.91) |
| Junior Certificate | 0.35*** (0.26; 0.48) | 0.80** (0.67; 0.95) |
| Leaving Certificate/Diploma | 0.50*** (0.35; 0.71) | 0.79* (0.64; 0.96) |
| (Ref.: University Degree) | | |
| Control variables | | |
| Child gender – Female | 1.59*** (1.34; 1.89) | 1.42*** (1.25; 1.60) |
| Primary caregiver born outside of Ireland | 1.00 (0.76; 1.31) | 0.91 (0.76; 1.10) |
| Secondary caregiver born outside of Ireland | 0.92 (0.70; 1.22) | 1.13 (0.93; 1.37) |
| Child born outside of Ireland | 0.86 (0.60; 1.24) | 0.90 (0.72; 1.14) |
| Child diagnosed with a learning disability | 0.23*** (0.18; 0.30) | 0.42*** (0.34; 0.52) |
| Child diagnosed with an autism spectrum disorder | 0.61 (0.28; 1.35) | 0.65 (0.36; 1.22) |
| Child diagnosed with an emotional or behavioural disorder | 0.25*** (0.13; 0.48) | 0.74 (0.43; 1.32) |
| Child having a speech or language difficulty | 0.57* (0.32; 1.03) | 1.65 (1.01; 2.79) |
| Child making slow progress | 0.13*** (0.07; 0.25) | 0.69 (0.40; 1.22) |

Note. Parental expectations

Model with control variables only (not presented): Pseudo $R^2_N = 0.095$, $\chi^2(9) = 294$, $p < .001$.

Model with control variables + socioeconomic background: $R^2_N = 0.240$, $\chi^2(19) = 769$, $p < .001$.

Models comparison: $\chi^2(10) = 475$, $p < .001$.

Teacher feedback

Model with control variables only (not presented): Pseudo $R^2_N = 0.021$, $\chi^2(19) = 115$, $p < .001$.

Model with control variables + socioeconomic background: $R^2_N = 0.027$, $\chi^2(19) = 152$, $p < .001$.

Models comparison: $\chi^2(10) = 37.4$, $p < .001$.

VIF and Tolerance statistics did not indicate multicollinearity.

*** $p < .001$, ** $p < .01$, * $p < .05$

Table M1.5

Students' Expectations Regressed on Self-Efficacy Antecedents and SES. Binomial Logistic Regression (Odds Ratios and 95% Confidence Intervals)

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | χ^2 |
|--|------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|------------------|
| | Odds Ratios and 95% CI | | | | | |
| Reading performance at age 9 | | 1.02*** (1.02; 1.02) | 1.02*** (1.02; 1.02) | 1.02*** (1.01; 1.02) | 1.01*** (1.01; 1.02) | 39.16*** |
| Math performance at age 9 | | 1.05*** (1.01; 1.02) | 1.02*** (1.01; 1.02) | 1.01*** (1.01; 1.02) | 1.01*** (1.01; 1.02) | 38.30*** |
| Literacy problems at school | | | | | | 6.70* |
| 10-25% | | | 0.62 (0.38; 1.02) | 0.54* (0.32; 0.91) | 0.57* (0.34; 0.96) | |
| More than 25% | | | 0.84 (0.54; 1.31) | 0.73 (0.46; 1.15) | 0.75 (0.47; 1.20) | |
| (Ref.: Less than 10%) | | | | | | |
| Numeracy problems at school | | | | | | 8.42* |
| 10-25% | | | 0.72** (0.57; 0.91) | 0.74* (0.58; 0.94) | 0.74* (0.61; 0.99) | |
| More than 25% | | | 0.45** (0.27; 0.74) | 0.42** (0.25; 0.71) | 0.49** (0.29; 0.82) | |
| (Ref.: Less than 10%) | | | | | | |
| Primary caregiver's expectations – University degree | | | | 3.05*** (2.49; 3.73) | 2.67*** (2.19; 3.30) | 96.25*** |
| Praise by the teacher | | | | | | 111.84*** |
| Never | | | | 1.43 (0.83; 2.49) | 1.44 (0.83; 2.50) | |
| Often | | | | 2.14*** (1.86; 2.47) | 2.14*** (1.85; 2.46) | |
| (Ref.: Sometimes) | | | | | | |
| Socioeconomic background | | | | | | |
| Income | | | | | | 0.42 |
| Lowest 20% | | | | | 0.94 (0.80;1.10) | |
| Highest 20% | | | | | 0.98 (0.84;1.15) | |
| (Ref.: Middle 60%) | | | | | | |
| Social class | | | | | | 1.39 |
| Semi- or unskilled working class | | | | | 0.89 (0.69; 1.14) | |
| Skilled working class | | | | | 1.01 (0.87; 1.18) | |
| (Ref.: Highly skilled professionals) | | | | | | |
| Primary caregiver's education | | | | | | 6.07 |
| Primary or less | | | | | 0.70 (0.42; 1.16) | |
| Junior Certificate | | | | | 0.82* (0.69; 0.98) | |
| Leaving Certificate/Diploma | | | | | 0.85 (0.710; 1.01) | |
| (Ref.: University Degree) | | | | | | |
| Secondary caregiver's education | | | | | | 31.29*** |
| Primary or less | | | | | 0.43*** (0.30; 0.63) | |
| Junior Certificate | | | | | 0.72*** (0.61; 0.85) | |
| Leaving Certificate/Diploma | | | | | 0.97 (0.79; 1.19) | |
| (Ref.: University Degree) | | | | | | |

MANUSCRIPT ONE. SOCIOECONOMIC GAP IN EXPECTATIONS

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | χ^2 |
|---|-----------------------------|-----------------------------|-----------------------------|---------------------------|---------------------------|--------------|
| | Odds Ratios and 95% CI | | | | | |
| Gender – Female | 1.12 (0.99; 1.25) | 1.25*** (1.10; 1.40) | 1.24*** (1.10; 1.40) | 1.11 (0.98; 1.26) | 1.15* (1.01; 1.30) | 4.47* |
| Primary caregiver born outside of Ireland | 0.98 (0.83; 1.17) | 1.00 (0.84; 1.21) | 1.01 (0.84; 1.21) | 0.99 (0.82; 1.19) | 0.96 (0.79; 1.16) | 0.19 |
| Secondary caregiver born outside of Ireland | 0.96 (0.81; 1.15) | 1.02 (0.85; 1.23) | 1.031 (0.86; 1.24) | 0.99 (0.81; 1.12) | 0.96 (0.79; 1.16) | 0.22 |
| Child born outside of Ireland | 1.32* (1.07; 1.65) | 1.33* (1.06; 1.67) | 1.33* (1.06; 1.67) | 1.30* (1.03; 1.64) | 1.21 (0.95; 1.53) | 2.49 |
| Child diagnosed with a learning disability | 0.47*** (0.37; 0.59) | 0.89 (0.69; 1.15) | 0.89 (0.69; 1.15) | 1.11 (0.85; 1.45) | 1.02 (0.78; 1.33) | 0.02 |
| Child diagnosed with an autism spectrum disorder | 0.71 (0.37; 1.37) | 0.69 (0.35; 1.35) | 0.70 (0.36; 1.37) | 0.80 (0.40; 1.62) | 0.77 (0.38; 1.54) | 0.57 |
| Child diagnosed with an emotional or behavioural disorder | 0.64 (0.34; 1.21) | 0.88 (0.46; 1.69) | 0.86 (0.45; 1.66) | 1.10 (0.56; 2.15) | 1.09 (0.55; 2.15) | 0.06 |
| Child having a speech or language difficulty | 0.86 (0.53; 1.40) | 1.05 (0.63; 1.74) | 1.05 (0.63; 1.74) | 1.00 (0.59; 1.71) | 1.00 (0.58; 1.71) | 0.02 |
| Child making slow progress | 0.29*** (0.14; 0.57) | 0.43* (0.21; 0.89) | 0.45* (0.22; 0.92) | 0.63 (0.29; 1.33) | 0.68 (0.32; 1.44) | 1.07 |

Note. *** p < .001, ** p < .01, *p < .05

Discussion

While recent research has shown that the gender gap in educational expectations has decreased (Reynolds & Johnson, 2011), the socioeconomic gap remains as present as ever and is likely to increase due to the consequences of the self-isolation and lockdown measures implemented to contain the spread of COVID-19 (Aucejo et al., 2020; Azevedo et al., 2020). Hence, it is important to understand what causes this gap and what can be done to bridge it. In the present study, we used self-efficacy theory as a theoretical framework to explain the link between socioeconomic background and educational expectations. We tested the effects of family income, social class, and parents' education on students' educational expectations before and after accounting for the three groups of self-efficacy antecedents (past mastery experiences, vicarious experiences, and persuasive information) on the representative sample of 13-year-old students, collected as part of the "Growing Up in Ireland" study.

In line with our expectations, the results indicate that self-efficacy theory is a valuable tool to explain the socioeconomic disparity in educational expectations of students. Poorer school performance, more negative experiences of their peers' achievements in school, lower expectations of their parents and less frequent positive feedback from their teachers are the mechanisms that contribute to lower self-efficacy of students with lower socioeconomic backgrounds, who form lower educational expectations compared to their counterparts from more well-off families.

In fact, self-efficacy antecedents fully explain the effects of family income, social class, and to a large extent the primary caregiver's education on students' educational expectations. We believe that these findings serve as additional evidence of the importance of self-efficacy in educational attainment, as previously suggested in the literature (Klassen & Usher, 2010; Komarraju & Nadler, 2013; Lent et al., 1984; Multon et al., 1991; Pajares, 1996; Zimmerman, 2000). Additionally, they confirm that the information about one's success is to a large extent dependent on one's early-life environment, providing an additional insight into the adopt-adapt debate (Andrew & Hauser, 2011).

Bandura's discussion of the functional properties of self-efficacy beliefs and the process of their development (Bandura, 1997) suggests that the effects of self-efficacy antecedents on self-efficacy beliefs are non-linear and diminish over time, and that once formed, self-efficacy beliefs guide the selection and interpretation of new information in a

belief-congruent manner. This means that if educational expectations rely on self-efficacy antecedents and beliefs, they too are likely to become more stable and resistant to change over time. Thus, early-life environment might be more important to the development of educational expectations, as postulated in status attainment model. Once formed, subsequent changes in educational expectations would only be possible if the new information about one's success is consistent, convincing, and unambiguous, which is in line with Andrew and Hauser's test of Bayesian learning theory (Andrew & Hauser, 2011). On a practical level, it means that it would be easier to target and mould educational expectations earlier in the course of their development and not when they are already fully formed.

Interestingly, among all socioeconomic variables in our analysis only secondary caregiver's education remained a consistent significant predictor of students' educational expectations after self-efficacy antecedents were accounted for. This might mean that the father's influence operates through mechanisms other than self-efficacy. One such mechanism could be the higher importance given to the father as a role model when it comes to the decision-making in educational and occupational domains. Despite the major social changes in recent years and increasing female participation in Irish society (Bercholz & FitzGerald, 2016), the cultural norms about a woman's role in society might still remain traditional (Murphy, 2018). Thus, it is likely that the father's expectations and opinions regarding their children's education might have more weight in children's educational expectations. This, however, is only an assumption that cannot be tested using the available data. As part of the "Growing Up in Ireland", only primary caregivers were asked about their expectations regarding their children's future educational attainment. Future studies might benefit from including father's perspective and investigating its role in the development of students' educational expectations and aspirations.

We believe that our findings point towards the possibilities to develop interventions that would help to bridge the socioeconomic gap in students' educational expectations by targeting disadvantaged students' self-efficacy beliefs. One way to achieve that would be to change the way we think about performance at standardized tests and what it means to children's self-efficacy and perceived competence. If performance at standardized tests is perceived as an indicator of ability that is fixed, disadvantaged children are more likely to develop a perception of themselves as being less capable and thus believe that the university

is not accessible for them. On the other hand, if a score on a test is understood as something that can be potentially improved with effort and persistence, it is more conducive to the development of a growth mindset (Dweck, 1996) and a positive sense of personal efficacy. This would in turn lead to the development of higher educational expectations. Recent research on growth mindsets (Claro et al., 2016) suggests that it has a potential to weaken the relationship between poverty and educational attainment.

Furthermore, children with disadvantaged backgrounds might benefit from their participation in extracurricular activities that would serve as an additional source of positive mastery. Research has shown that self-efficacy developed in one domain of activity can generalise to other domains to a certain extent (for a discussion on self-efficacy generalisation, see Bandura, 1997). By focusing on the similarities in the learning process, the development of higher-order self-regulatory skills that guide a range of activities in different domains of life and instilling the idea that one can master a range of skills if she is conscientious and persistent, it would be possible support disadvantaged children in developing a positive sense of self-efficacy and in setting more ambitious goals regarding their future education. It is important to note that the timing of when such mastery experiences are acquired also matters. Given the non-linearity in the development of self-efficacy beliefs, earlier positive mastery experiences are likely to be more effective. Thus, the interventions should target children whose self-efficacy beliefs and educational expectation are not yet fully formed for a larger effect.

In conclusion, the study we presented allows for a better understanding of the relationship between socioeconomic background and educational expectations and the development of strategies aimed at improving the educational outcomes of children coming from less privileged backgrounds. While the relationship between the socioeconomic position and educational expectations has been well-established, the question on how the expectations are formed and ossify remained unresolved (Andrew & Hauser, 2011). When dealing with the formation of beliefs, most sociological research remains fairly vague and refers to processes such as socialisation or the internationalisation of norms (Breen, 1999), without specifying the mechanisms behind these processes. The results of our study suggest that lower self-efficacy beliefs may be accountable for the lower educational expectations of children coming from lower social strata. Future research should include more direct measures of self-efficacy in academic and educational domains and extend to other geographical and cultural contexts.

Manuscript 2. Using Bandura’s Self-Efficacy Theory to Explain Individual Differences in the Appraisal of Problem-Focused Coping Potential³

challenges. While some are extremely anxious giving a public speech, others feel excited about it. Similarly, while some feel helpless facing a life-threatening condition, others have a much more optimistic outlook regarding their chances to fight a disease. So, what explains why we are so different in our reactions to the same situation?

Appraisal theory (Arnold, 1960; Frijda, 1986, 2007; Lazarus, 1991; Roseman, 1984; Scherer, 1984, 2009; Smith & Ellsworth, 1985) attempts to shed light on this systematic variability by introducing the concept of appraisal – an immediate evaluation of an individual’s circumstances in relation to their personal well-being. It suggests that one’s emotional reaction to the situation depends on such evaluations. Appraisal theorists proposed different dimensions of appraisal. Among these are motivational relevance, goal conduciveness, accountability, coping potential, and compatibility with internal standards, to name a few. Individual evaluations in any given situation, or in response to a given event, may differ on each one of these dimensions.

Although the notion of appraisal was an important development in the emotion literature, our understanding of the process of appraisal is still limited, particularly when it comes to its antecedents. There is a widespread assumption among appraisal theorists that subjective experiences, values, and beliefs may play significant roles in this process. However, there have been few attempts to propose a formal framework that would address the mechanisms underlying individual differences in appraisal.

In response to this gap, the current paper aims to extend our understanding of individual differences in appraisal and emotion by integrating Bandura’s self-efficacy theory into appraisal theory. We focus on a specific appraisal dimension – problem-focused coping potential – which refers to one’s ability to take action and make the situation more congruent

³ With Arvid Kappas and Craig Smith. Olga Poluektova conceived the original idea of the paper, reviewed the existing literature, wrote the first version of the manuscript, prepared the manuscript for submission to the journal. All authors contributed to the development of the theoretical model outlined in the paper, writing, and revising the manuscript. The manuscript is currently under review in *Emotion Review*.

with one's goals (Smith & Kirby, 2009a). Using self-efficacy theory, we attempt to explain how individual differences in the appraisal of problem-focused coping potential emerge.

We believe that a more refined understanding of the individual differences in the appraisal of problem-focused coping potential would enhance our ability to explain individual differences in general well-being and life success. Being confident in one's ability to successfully cope with problems and overcome difficulties has enormous benefits for a range of economic, social, and psychological outcomes. In addition to playing a vital role in our emotional reactions, this assessment serves as important guidance for the choices we make and for our behavioural responses to our circumstances. Thus, an in-depth analysis of the processes underlying this assessment would allow us to predict emotions, decisions, and behaviours more accurately, as well as to be able to improve them by means of therapy or policy interventions targeting appraisals.

This article includes two main parts: (1) an overview of the literatures on appraisal and self-efficacy, and (2) theoretical framework that outlines the role of self-efficacy beliefs in the appraisal of problem-focused coping potential. In the first part, we review appraisal theory and theory of self-efficacy and summarize their main theoretical assumptions. We show that the understanding of self-efficacy has been extended from previously viewing it as a highly specific judgement to describing it as a more stable and general personal belief. We compare the appraisal of problem-focused coping potential, self-efficacy as a judgement (how it was formulated initially) and self-efficacy as a belief (more recent view of self-efficacy) regarding their content, scope, and properties. In the second part, we argue that self-efficacy beliefs and appraisal of problem-focused coping potential are two components of the same process and present a model that illustrates this process. In this model, self-efficacy serves as a stable antecedent of problem-focused coping potential, a dispositional factor responsible for the inter-individual variability and intra-individual stability of appraisal. We conclude with the implications of this work for theory, research, and practice.

Self-Efficacy and Appraisal of Coping Potential: Brief Literature Overview and Comparison of the Two Concepts

Appraisal Theory of Emotion

The term appraisal was coined by Magda Arnold (1960) in reference to the cognitive processes preceding emotional experiences. According to Arnold, emotional experience starts with the appraisal of the situation. An initial appraisal leads to the arousal of both the corresponding physiological reactions and the emotional experience itself. She outlined three appraisal components: evaluation (good/bad for me), presence (present/certain versus future/uncertain), and coping potential. Soon after, Richard Lazarus brought appraisal into his theory of stress emotions (Lazarus & Folkman, 1984; Lazarus, 1966) and made the concept “scientifically respectable” (Reisenzein, 2006) through his empirical work (e.g., Lazarus, 1964; Lazarus & Alfert, 1964). Following Arnold, Lazarus also differentiated between various components of the appraisal process; in his formulation – primary and secondary appraisals, with primary appraisals corresponding to the evaluations of the relevance of the situation to individuals’ well-being, and secondary appraisals – to the evaluations of their options and resources for coping with the situation (Arnold’s coping potential). In the following decades, appraisal became a central part of appraisal theory (Frijda, 1986, 2007; Lazarus, 1991; Roseman, 1984; Scherer, 1984, 2009; Smith & Ellsworth, 1985), which largely adopted the framework initially formulated by Arnold.

In their review, Moors and colleagues (2013) summarized the key theoretical assumptions that differentiate appraisal theory from other theories of emotion. These assumptions are: (1) appraisal is a key determinant and differentiator of various emotional states, (2), appraisal is a process and this process can be both deliberate and automatic, and (3) individual differences play a significant role in the appraisal process (Moors et al., 2013). Let us elaborate on each of these.

Appraisal is an Antecedent and Differentiator of Emotional Experience

The key premises of appraisal theory are that (1) emotion starts with the appraisal and (2) knowing the pattern of appraisal, one can predict the specific emotional state. As for the latter, in their intention to differentiate between various emotional states, appraisal theorists have proposed several dimensions of appraisal. The most commonly accepted of these are

novelty, valence or pleasantness, certainty or predictability, agency and coping potential (Ellsworth & Scherer, 2003). The fact that different emotional states are associated with different patterns of appraisal has been empirically supported by a large body of research (e.g., Ellsworth & Smith, 1988; Roseman, Spindel, & Jose, 1990; Roseman, 1991; Scherer, 1997; Smith & Ellsworth, 1987), with the correlation between different patterns of appraisal and particular self-reported emotions being relatively strong. Additionally, researchers have reported considerable cross-cultural consistency in the associations between different dimensions of subjective experience and appraisals (e.g., Mauro, Sato, & Tucker, 1992). The role of appraisal as an antecedent of emotion, however, although generally assumed by appraisal theorists, has often been a subject of debate (Frijda & Zeelenberg, 2001; Frijda, 1993; Zajonc, 1980) and has received much less empirical support. The criticisms included the argument regarding the mutual independence of cognitive and affective processes (Ledoux, 1989; Zajonc, 1980) and the lack of differentiation in the appraisal literature between appraisal as a component of emotional experience (the information usually contained in self-reports) and appraisal as a cause of emotion (Frijda, 1993; Parkinson & Manstead, 1992). The first criticism seems to relate to the meaning of “cognitive” and seems to imply that cognitive processes are always deliberate. The second criticism refers to the predominance of self-reports as the main instrument to measure appraisal and points to the fact that it is unlikely that appraisals expressed in a self-report, being a result of a deliberate cognitive process, would qualify as an antecedent of emotion. Both criticisms are resolved by the assumption that appraisals can operate outside of one’s immediate awareness.

Appraisal Can be an Automatic Process

Appraisal has been described as a “process of transformation of one kind of information into a different kind of information” (Kappas, 2001, p. 163) and most appraisal theorists agree that this process can be automatic (Arnold, 1960; Kappas, 2001; Kappas, 2006; Lazarus, 1991; Leventhal & Scherer, 1987; Moors, 2010; Smith & Kirby, 2000). Indeed, it would be very cognitively taxing for the appraiser to go through the same exhaustive appraisal process every time (Kappas, 2006), besides, it would not qualify it as an antecedent of emotion. In addition, one of the key adaptational functions of emotion is directing one’s attention towards relevant events so that one can respond to them appropriately – a function that would

not work well, as noted by Smith and Kirby (2000), if the mechanism underlying emotion elicitation was highly dependent on attention. Currently, most existing appraisal theories differentiate between two levels or modes (except for Leventhal & Scherer, who proposed a three-level model) of appraisal process. Similar to the dual process theories developed to describe information processing in decision-making (Kahneman, 2011), impression formation (Brewer, 1988) and persuasion (Petty & Cacioppo, 1986), appraisal theories differentiate between deliberate and associative information processing, suggesting that appraisal can operate on both levels. In the case of deliberate information processing, appraisal is guided by the reasoning that is often conscious, explicit, and controlled. In the case of associative processing, appraisal is guided by unconscious reasoning, which is implicit, automatic and relies on pre-existing knowledge structures, such as prior memories and cognitive schemata. The fact that pre-existing structures participate in the appraisal process invites us to take a closer look into the role of individual differences as one of the antecedents of appraisal.

Appraisal is a Result of the Influence of Dispositional and Situational Factors

As previously noted, people differ in the ways they react to events. One of the main tasks of appraisal theories has been to address this variability in emotional reactions to the same situation among different people and in one person over time (Roseman & Smith, 2001). Appraisal has often been described as relational (Lazarus, 1991; Smith & Lazarus, 1993), and it was suggested that both dispositional and situational factors participate in the appraisal process (Kappas, 2001; Lazarus & Folkman, 1984; Smith & Kirby, 2009). In support of the relational approach, Smith and Kirby (2009b) have demonstrated that appraisals of problem-focused coping potential about solving a math task with different levels of difficulty are influenced both by one's ability beliefs – a stable dispositional factor, and task difficulty – a situational parameter. Furthermore, Griner and Smith (2000) have shown that individuals' affiliative orientation predicts appraisals of motivational relevance when the situation was presented as interpersonally challenging. It has been proposed that one's personality and cultural affiliation (Scherer, 1997), as well as developmental period (e.g., Moors et al., 2013), might be important individual differences in the appraisal process. Together with the situational factors, these individual differences are likely to influence appraisals and thus ensure that they show a degree of stability over time and are different in different people.

Individual differences, in the form of internalised past experiences, are also important for our understanding of appraisal as an automatic process. Most situations or events that people encounter are not entirely new to them. Thus, entering these situations, individuals are not blank slates – they have their “baggage” in the form of their past experiences. Internalised past experiences are likely to contribute to the appraisal process (Kappas, 2001), even though every new situation is not exactly the same as all previous ones. Smith and Kirby’s (2000) process model of appraisal illustrates how memories of past experiences may trigger appraisals quickly and automatically through priming and spreading activation. In this way, individual differences (in the form of internalised past experiences) have a potential to (1) systematically “bias” the appraisal process and (2) solidify connections that are the basis of the automatic information processing of a situation’s potential implications. This process is similar to the mechanisms of the predictive coding framework (Friston, 2018) that describes how our brain shapes our perception and constantly updates our mental model of the environment. Models such as these are still in the early stages of development, and there is a general acknowledgement that further investigating the role of individual differences in appraisal is necessary to better understand inter-individual variability in emotion.

As can be seen in the above review, the three discussed assumptions are linked in a sense that each is a condition for the others to occur (e.g., automaticity is a necessary feature of appraisal for it to qualify as an antecedent of the other components of emotion), or one explains the other (individual differences are a key element in an automatic judgement process). When it comes to individual differences though, despite being central to the goals of appraisal theories, their role in the appraisal process is rarely the centre of researchers’ attention, and they are still not completely understood. This is where self-efficacy theory comes to the fore.

Self-Efficacy Theory

In 1977, Albert Bandura introduced his social-cognitive theory, which centred around self-efficacy – a personal judgement of how well one can execute the course of action required to deal with prospective situations (Bandura, 1977). He proposed that individuals’ perceptions of efficacy predict whether they will engage in coping behaviour and how long they will persist in the face of setbacks. According to Bandura, individuals with high self-efficacy will exert sufficient effort, which will lead to a successful outcome. Those with low self-efficacy, on the

contrary, are more likely to give up early and fail. Since it was first presented, self-efficacy has been linked to a variety of psychological and behavioural outcomes, ranging from academic success (e.g., Komarraju & Nadler, 2013), to creativity (Haase et al., 2018) and self-management of chronic disease (e.g., Farrell, Wicks, & Martin, 2004).

Self-efficacy was initially conceptualised as an extremely specific and contextualised judgement of one's perceived ability to enact a specific behaviour. Bandura proposed that self-efficacy judgements are formed as a result of an integration of four sources of information: enactive mastery experiences (How well did I do at similar tasks in the past?), vicarious experiences (How well are others doing?), persuasive messages (What do others think and say about my ability and performance?) and physiological states (Am I tired/depressed?), with enactive mastery experiences being the most important source of efficacy information. This classification was later broadened and refined by Gist and Mitchell (1992), who added a few more sources (personality factors, available support, task parameters) and differentiated between the internal (e.g., ability) and external (e.g., task parameters) sources of efficacy information, and between the sources that are low (personality) and high (mood) on variability.

Importantly, Bandura differentiated between efficacy expectations and outcome expectancies (Bandura, 1977). The latter refers to one's estimate that a given behaviour will lead to a certain outcome. Self-efficacy expectation, on the other hand, is the conviction that one can successfully execute behaviour needed to produce this outcome. Together, outcome expectancies and efficacy expectations produce an expectancy of success that predicts emotional experience and behaviour.

The initial formulation of self-efficacy was very close to the understanding of secondary appraisal as discussed by Lazarus and Folkman (1984). They write: "To couch Bandura's ideas in our frame of reference, we would say that efficacy expectancies are part of secondary appraisal, which also includes an evaluation of alternative coping strategies" (Lazarus & Folkman, 1984, p. 70). Secondary appraisal refers, in part, to the appraisal of problem-focused coping potential – one's perceived ability to improve their unfavourable circumstances (Smith & Kirby, 2009a).

Although Bandura originally set out self-efficacy as a highly contextualised and specific judgement, the concept is better known as, "self-efficacy beliefs", usually a more global phenomenon (Chen et al., 2001; Jerusalem & Schwarzer, 1992; Luszczynska et al., 2005;

Sherer et al., 1982) than initially formulated. Even though this difference in naming is rarely explicitly addressed and might seem unimportant, taking a closer look at Bandura's later accounts, it becomes clear that it is not only the name that is different, but also the essence. In particular, he writes,

The weight people give to new experiences and how they reconstruct them in memory also depends, in part, on the nature and strength of self-efficacy beliefs into which those experiences must be integrated. ... After a strong sense of efficacy is developed through repeated successes, occasional failures or setbacks are unlikely to undermine belief in one's capabilities. (Bandura, 1997, p. 82).

This change in the way self-efficacy is described has direct implications for the general theoretical understanding of the concept and is crucial to our current discussion in light of its comparison with appraisals of problem-focused coping potential and its contribution to appraisal theory. Judgements and beliefs refer to distinct types of psychological phenomena. In the English language the word "judgement" is used both to describe "a process of forming an opinion or evaluation" (*Judgement / Definition of Judgement by Merriam-Webster, 2019*) and the result of this process. In the process of judgement, individuals integrate relevant available information from various sources. The outcome of the judgement process is contextualised and specific to "here and now". On the other hand, beliefs are something more static. For instance, dictionaries define belief as "a state or habit of mind" and something that is "accepted, considered to be true and held as an opinion" (*Belief / Definition of Belief by Merriam-Webster, 2019*). In psychology, beliefs are considered to be a form of mental representation and are synonymous to cognitive schemata – mental structures that individuals use to organise knowledge and guide cognitive processes and behaviour (Bartlett, 1932). Beliefs are relatively stable and can be more general (e.g., referring to a broader domain of functioning) or more specific (e.g., referring to a very narrow task).

So, while the earlier formulation of self-efficacy as a situational judgement is rather close to the meaning of the appraisal of problem-focused coping potential, its later representation in the literature as a more stable individual difference means that it has different properties and a different function. We summarize the differences between the appraisal of problem-focused coping potential, self-efficacy judgement in its initial formulation and self-efficacy beliefs in Table M2.1. We believe that self-efficacy judgement is a part of the appraisal

of problem-focused coping potential, and that in its meaning and function, the appraisal is most similar to the expectancies of success that are shaped by the combination of outcome expectancies and efficacy expectations. Speaking about the properties of appraisal of problem-focused coping potential, appraisal and self-efficacy judgement are quite similar, with one notable difference being that self-efficacy judgement was formulated as a very narrow in scope and highly specific phenomenon that refers to a single behaviour. Appraisals of problem-focused coping potential are somewhat broader in scope; in that they may potentially refer to many behaviours and thus include many parallel judgements of individuals' abilities to exert these behaviours (self-efficacy judgements). Turning to the properties of self-efficacy beliefs, they are usually broader, more stable and should be viewed as dispositional antecedents of the appraisal of problem-focused coping potential. We discuss this proposition in greater detail in the next section.

How Can Self-Efficacy Theory Enhance Our Understanding of the Process of Appraising Problem-Focused Coping Potential?

Following the comparison of self-efficacy and appraisals of problem-focused coping potential, we put forward a model that integrates them as elements of a single process (Figure M2.1). We suggest that appraising one's problem-focused coping potential relies on outcome expectancy and self-efficacy judgements that are formed in parallel. When one is faced with a challenging event or a situation that is relevant to their well-being, they need to decide what the desired outcome is and what needs to be done in order to make this outcome happen (outcome expectancy). The importance of this step stems from the fact that only knowing what the desired outcome is and what is required in order to achieve it, one becomes motivated to act. Outcome expectancy judgements are likely to be influenced by a set of pre-existing beliefs, values and norms that may have different content in different people, and thus outcome expectancy judgement may be one source of variation in the appraisal of problem-focused coping potential. Let us imagine one is looking for a job. While the goal is to find a job, people might have different ideas of what needs to be done to achieve that goal. While some might believe that making as many unspecific applications as possible would be the best strategy, others might only focus on a few jobs and prioritise tailoring their application materials to each of these jobs. These are two different strategies and choosing one over the other would likely

reflect individuals' ideas of how success in this matter is achieved. At the same time, faced with a challenge, one must determine whether they can execute behaviours necessary to produce a desired outcome (self-efficacy judgement). As we discussed previously, self-efficacy judgement formation relies on the information from two main sources: the parameters of the situation/task at hand and past mastery experiences (internalised and crystalised in stable self-efficacy beliefs).

We suggest that self-efficacy beliefs function as a filter, or a systematic bias, that guides the way the information about the parameters of the situation is integrated in the process of appraisal of problem-focused coping potential. As discussed in the literature on confirmation bias (Nickerson, 1998), one's tendency to attend to and interpret the information in a way that it confirms one's pre-existing beliefs, self-efficacy beliefs guide the way people attend to, recall and interpret information in a belief-congruent way. This exact property of self-efficacy is responsible for the inter-individual variability and intra-individual stability in appraisal over time. In the following section, we take a closer look at this process and elaborate on a range of selection processes that may be guided by self-efficacy beliefs and that participate in the appraisal process.

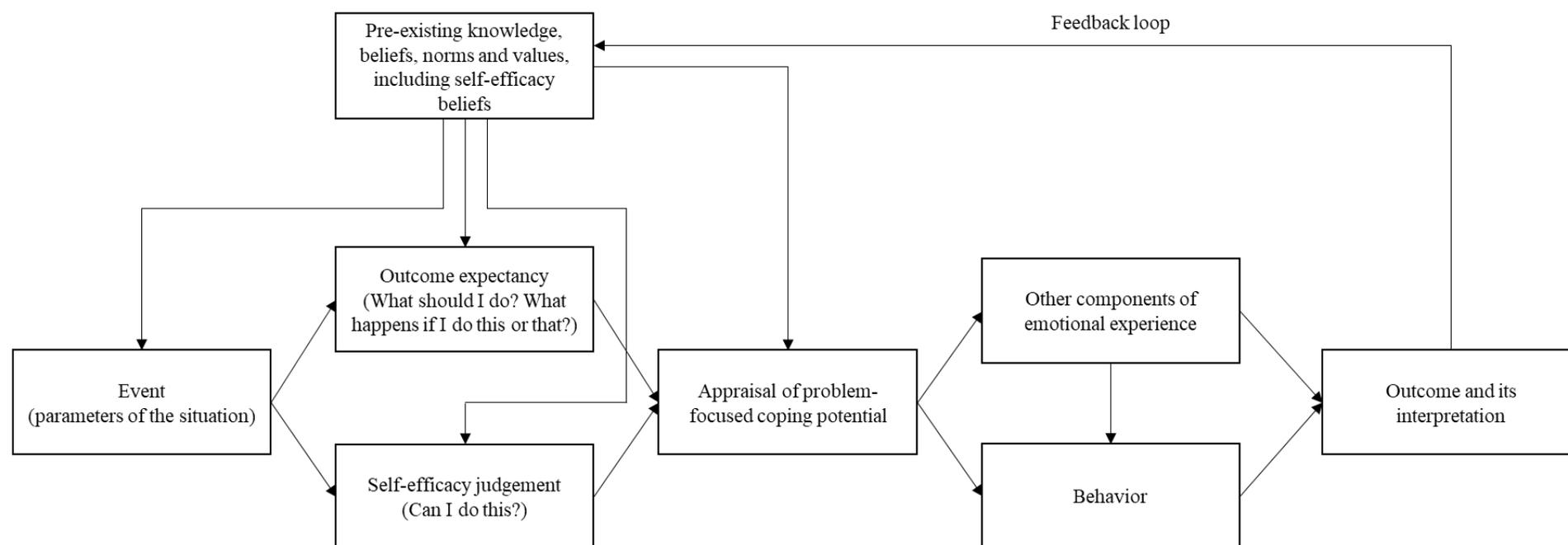
Table M2.1

The Comparison of the Properties of Appraisals of Problem-Focused Coping Potential, Self-Efficacy Judgements and Self-Efficacy Beliefs

| | Appraisals of problem-focused coping potential | Self-efficacy judgements | Self-efficacy beliefs |
|------------------------------|--|---------------------------------|--|
| Stability | Show a degree of stability over time, however, as they are influenced by the constellation of situational demands, are subject to variation from situation to situation. | | Stable, resistant to change. |
| Generality | Specific to the task and situation at hand, however, self-efficacy judgements are more specialized than appraisals of problem-focused coping potential. Self-efficacy judgements refer to a single behaviour, while appraisal can potentially include perceived capability to execute a range of behaviours necessary to change the unwanted situation for the better. Appraisal is most similar to the expectancies of success. | | Can vary in generality, from self-efficacy beliefs that are task specific to general self-efficacy beliefs that reflect individuals' perceived ability to perform successfully across a wide range of tasks and domains of activity. |
| Main purpose/function | Predicting emotion, motivation, behaviour. | | Guiding cognitive processes underlying emotion, motivation, and behaviour. |
| Level of processing | Although Bandura does not make an explicit distinction between the different levels of self-efficacy judgement formation, he does mention that over time, when one has formed a schema of their ability, the process of judgement becomes less deliberate. Appraisal theories explicitly propose that the process of appraisal can be both associative and deliberate. | | Self-efficacy beliefs form over a period of time as a result of repeated mastery experiences. While such experiences may be processed consciously and carefully analysed, self-efficacy beliefs can be shaped and maintained through our experiences of success and failure quite tacitly. |

Figure M2.1

The Process of Appraisal of Problem-Focused Coping Potential



Self-Efficacy Beliefs and Information Processing: Attention, Memory and Attribution

Attentional Bias

Research has consistently confirmed that our attention may be systematically biased by a variety of individual characteristics, such as, for instance, attachment style (Rowe & Carnelley, 2003), dispositional optimism (Seegerstrom, 2001), presence of an emotional disorder (Bar-Haim et al., 2007; Epp et al., 2012; Greenberg et al., 1992; MacLeod et al., 1986), and self-esteem (Dandeneau & Baldwin, 2004; Li et al., 2012), to name a few. The key idea is that these individual characteristics (e.g., low self-esteem) make congruent stimuli (e.g., negative information about oneself) more salient. To date, at least one study has linked generalised self-efficacy beliefs with an attentional bias in processing threat-related stimuli, such that individuals with lower self-efficacy exhibit greater bias towards threat-related stimuli (Karademas et al., 2007).

This attentional bias is directly relevant to the process of appraisal. As mentioned previously, when individuals make appraisals, they are usually exposed to a large amount of information. Given that the formation of appraisal is often automatic and thus takes very little time, it is practically impossible to process all appraisal-relevant information at once. It means that some information will be left out and not participate in the formation of appraisal.

We suggest that self-efficacy beliefs play the role of an attentional filter and determine which information does and does not participate in the appraisal process. In real-life settings (as opposed to laboratory experimental conditions), appraisal-relevant information is rarely unambiguous. More often, the environment presents both positive (cues for success) and negative (cues for failure) stimuli that could potentially inform appraisals of problem-focused coping potential and determine subsequent emotional and behavioural responses. In such cases, pre-existing self-efficacy beliefs should act in the same manner as other relatively stable individual differences (such as dispositional anxiety and depression, self-esteem, or attachment style) biasing attention towards stimuli that are congruent with pre-existing self-efficacy beliefs. Thus, in a situation of appraisal formation, individuals with low self-efficacy should be more likely to direct their attention towards cues indicating potential failure, whereas individuals with high self-efficacy – towards cues indicating the possibility for success.

Memory Bias

Memory activation is the central part of associative processing, which, as discussed previously, often underlies appraisal. Putting forward their process model, Smith and Kirby (2000) argued that once the information relevant to the appraisal is identified in the environment, it triggers the activation of memories storing relevant information about one's past experiences and similar events or situations. As self-efficacy beliefs represent consolidated past experiences, it is likely that they, too, can be activated in the process of appraisal in an automatic and effortless way. Moreover, they can bias the way other information relevant to the appraisal of problem-focused coping potential is retrieved from memory.

As in the case of attentional biases, research has demonstrated that individual differences are important to memory processes. For instance, high levels of social (Morgan, 2010; Moscovitch et al., 2018) and generalised (Burke & Mathews, 1992) anxiety were found to bias autobiographical memory retrieval towards more threatening stimuli. Similarly, depressive disorder was linked with a negative memory bias that favours the theme of sadness (see Gotlib & Joormann, 2010, for a review). Furthermore, studies on the role of self in memory found that autobiographical memory retrieval is impacted by self-esteem (Christensen, Wood, & Barrett, 2003; Sedikides & Spencer, 2016), with higher global self-esteem predicting positive shifts in memory, and lower global self-esteem being responsible for negative shifts. Finally, research on the role of self-enhancement motive in memory has shown that people with higher self-esteem are more susceptible to positivity bias – subjectively remembering positive events with more details than negative events (D'Argembeau & Van der Linden, 2008) – and report higher levels of psychological closeness with positive memories (Demiray & Janssen, 2015).

Based on these findings, we argue that self-efficacy can bias memory in the same way as other individual differences. Low self-efficacy beliefs should make individuals more likely to spontaneously recall situations and scenarios in which they failed. On the contrary, high self-efficacy should make the recall of situations in which one succeeded more probable. This should have direct implications for the appraisal of problem-focused coping potential, predisposing individuals with low self-efficacy beliefs to appraise their coping potential as lower.

Self-efficacy and Causal Attribution

While the judgement of attribution is not directly relevant to and is not part of the process of appraising coping potential, it plays a crucial role in the formation and preservation of self-efficacy beliefs (Bandura, 1997) and thus contributes to the stability in the appraisal of problem-focused coping potential over time. Once the behaviour takes place and the individual is confronted with the outcome of their actions (e.g., success or failure at a certain task), it is crucially important to know how they explain this outcome.

The process of attribution is known to be biased (Bradley, 1978; Larson, 1977; Mezulis et al., 2004; Miller & Ross, 1975), and individual differences can be a source of this bias. For instance, previous research has revealed that individuals with high Just World beliefs are more likely to put the blame on rape victims (Russell & Hand, 2017). Additionally, studies have demonstrated that people with high self-esteem are likely to make more dispositional attributions for their success (Blaine & Crocker, 1993; Fitch, 1970; Lane et al., 2004; Schlenker et al., 1990).

Given the overwhelming evidence in the support of self-esteem as an individual difference in self-serving bias, we believe that self-efficacy beliefs are also likely to bias the process of attribution. The variety of outcomes of the behaviour that follows the appraisal can be broadly classified into the categories of success and failure. In case of success, the situation could change and become more conducive to one's well-being (or remain the same if it was good already). In case of failure, the situation could remain unfortunate or could change and become less conducive to one's well-being. The task of the individual is to understand why the change (or the lack thereof) occurred, including who or what was responsible for the success or failure. We argue that people with high self-efficacy beliefs would be prone to attribute success to internal stable factors (e.g., their ability) and failure to either internal unstable (e.g., tiredness) or external (available time) factors. At the same time, people with low self-efficacy would be more likely to attribute their success to internal unstable and external factors, and their failure to internal stable factors. This pattern of attribution reinforces pre-existing self-efficacy beliefs and thus contributes to their stability.

Conditions That Moderate the Relationship between Self-Efficacy Beliefs and the Appraisal of Problem-Focused Coping Potential

Because appraisals are bound to specific situations, and because each situation presents the appraiser with a unique combination of information about situational and task parameters, it is likely that the role of self-efficacy beliefs in the appraisal of problem-focused coping potential is not uniform and there is some degree of variability across different situations in how much weight self-efficacy beliefs have in the appraisal. We believe that at least three factors – ambiguity of the situation or task, difficulty of the task, and mode of information processing – may explain why self-efficacy can be a stronger predictor of appraisal in some situations.

Task and Situation Ambiguity

The information about the task is rarely fully available and unambiguous – more often individuals operate in situations of uncertainty, in which it is exceedingly difficult to make an accurate prediction of their objective chances to succeed or fail given the parameters of the task and the situation. We suggest that self-efficacy beliefs will play a greater role in the appraisal if other appraisal-relevant information is absent (or not easily identified) or ambiguous. In the former case (the absence of information), self-efficacy serves as the only piece of information relevant to the appraisal and thus its effect on the appraisal should be the strongest. In the latter case, when the information is ambiguous, the processes that we discussed above (selective attention and memory) take place. In this case, self-efficacy beliefs filter the information in a way that it confirms pre-existing beliefs. On the other hand, when the information is unambiguous (which is, again, rarely the case in real-life scenarios), self-efficacy is likely to have less weight in the appraisal.

Task Difficulty

Some of the existing literature on appraisal suggests that the difficulty of the task is also likely to be a factor moderating the importance of pre-existing self-efficacy beliefs in the appraisal of problem-focused coping potential. For instance, in his discussion of transfer functions, Kappas (2001) suggested that there would likely be no variance between individuals

in their appraised coping potential, if the task they were faced with was either very easy (then the appraisal would be uniformly high) or very difficult (low appraisal).

Another example serving as evidence for the moderating role of task difficulty is the study on the relational antecedents of the appraisal of problem-focused coping potential by Smith and Kirby (2009b), in which the interaction between task difficulty and perceived ability was empirically tested. The authors hypothesized that when faced with a very easy problem, all participants would believe that their abilities exceed the task demands and thus report high levels of problem-focused coping potential, whereas when faced with a difficult problem their perceived ability level would partially determine whether they would perceive the task requirements as exceeding their abilities, with this becoming less likely with higher self-perceived ability. Their findings largely confirmed these predictions – there was a minor variation in the appraisal of problem-focused coping potential when the task was easy; however, when the task was difficult, appraisal varied as a function of ability factors.

Building on these examples, we suggest that when the task is perceived as either very easy or impossible, self-efficacy beliefs would have insignificant effect on appraisals of problem-focused coping potential because virtually everyone would see the task as within their abilities when easy, and beyond them when impossible. When the task difficulty is somewhere between these two extremes, individuals with higher self-efficacy should appraise their problem-focused coping potential as higher than those with lower self-efficacy.

Mode of Information Processing

As discussed previously, the process of appraisal can be both associative and deliberate. Associative appraisal is guided by activation of the relevant information from memory (including pre-existing knowledge structures, such as beliefs). In such cases, self-efficacy beliefs are either directly activated or guide the processing of other appraisal-relevant information in a selective manner. On a deliberate level, individuals rely on more systematic reasoning that leaves less room for bias (e.g., Evans, 2008). Although there is some evidence (for instance, the role of depression in explicit memory) that pre-existing beliefs can still be a factor in the judgement when it is formed on a more deliberate level, we expect that the role of self-efficacy beliefs will be greater when an associative mode of processing is involved as opposed to a deliberate mode. Such factors as tiredness, high levels of stress, or being in a state

of alcohol intoxication (e.g., Casbon, Curtin, Lang, & Patrick, 2003) have been shown to reduce cognitive capacity and thus are likely to predispose one to rely on associative processing. Understanding the mechanics of the interaction or integration of the different levels of processing is one of the great current challenges for appraisal theory.

Implications for Research and Practice

Appraisal of problem-focused coping potential – an individual’s perceived ability to take action and to change a situation to make it more congruent with one’s goals (Smith & Kirby, 2009a) – is an important factor in emotion, motivation, and behaviour. Despite the assumption that pre-existing individual differences underlie appraisal, our knowledge of which personality characteristics specifically play a role in the appraisal of problem-focused coping potential and the mechanism through which it happens remains scarce. To bridge this gap, in this article we attempted Bandura’s self-efficacy theory into appraisal theory in order to explain how individual differences in appraisal may come about.

Specifically, we proposed that self-efficacy beliefs represent a stable individual difference that “biases” the process of appraisal and thus can be used to predict one’s reactions to a challenging situation. *We integrated self-efficacy beliefs and the appraisal of problem-focused coping potential into a single framework suggesting that both are elements of a single process and are in a dynamic relationship with one another.* In addition to presenting the argument related to the direct link between the two constructs, we discussed (1) a range of selection processes that underlie the effects of self-efficacy beliefs on the appraisal of problem-focused coping potential, and (2) the conditions that might moderate the predictive power of self-efficacy beliefs in the appraisal.

We believe that such a framework is useful for four main reasons. First, it provides additional insight into intra-individual stability of appraisal over time and inter-individual differences in appraisal of the same event. Self-efficacy beliefs, which we suggest act as a bias in the process of appraising one’s problem-focused coping potential, develop through repeated mastery experiences becoming more stable and resistant to change with time. These experiences and the way they are processed are unique for everyone. Thus, it is natural that the same person, being led by a stable self-efficacy belief, would make similar appraisals of problem-focused coping potential over time. At the same time, the uniqueness of past

experiences makes it consistent for different people to see the same situation and their resources in relation to it differently and thus making different appraisals of their problem-focused coping potential in this situation.

Second, it is our belief that the framework we are proposing allows for asking and answering a broader set of questions related to the role of early-life environment and socialisation in the appraisal and associated emotional experience and behaviour. Mastery experiences, the primary and the most important source of self-efficacy beliefs, are shaped by the physical and social environments in which we grow up. Some people are raised in environments that are more conducive to having more positive mastery experiences and thus developing a more positive sense of self-efficacy – for instance, those who are born into a high-status family. Others are less lucky and grow up in less beneficial circumstances that might hinder their acquisition of a positive sense of self-efficacy. Oftentimes it is something that we cannot change about ourselves – like our sex, skin colour, or disability – that in many ways determines what experiences we are going to have and whether we will be successful at them. In addition to contributing to the experiences themselves, our belonging to a particular social group and/or growing up in a certain environment also contributes to the way we interpret these experiences. Our parents, siblings, friends, and teachers not only encourage or discourage us when it comes to engaging in certain types of activities; they also teach us how to think about and explain our success and failure at those activities – another key factor in the development of self-efficacy beliefs. For instance, in some cultures, it is normative to attribute success to external factors (i.e., to take less personal responsibility for success – it is considered a sign of humility) and failure to internal factors. Thus, people socialised in such cultures would likely systematically differ in the way they would develop self-efficacy and appraise their problem-focused coping potential.

Third, understanding how individuals' group memberships and associated early-life experiences are solidified in self-efficacy beliefs, which further translate into their appraisals of problem-focused coping potential, we get a better chance at improving emotional and behavioural outcomes of certain groups of people by designing, evaluating, and implementing policy solutions in the form of interventions. Such interventions might target specific factors that we know are likely to hinder the development of a positive sense of self-efficacy beliefs. For instance, knowing that children from economically challenged families or children from

families with migration background chronically underperform at schools, we might provide them with alternative ways to develop a positive sense of self-efficacy, by, for instance, providing additional tutoring in the first years of primary school, or by engaging them in alternative activities (e.g., sports) where they could build up mastery experiences. Both strategies would allow such children have more positive mastery experiences and thus become more likely to develop a positive sense of efficacy. This, in turn, would mean that in future challenging situations, they would be more likely to appraise their problem-focused potential as high, feel less resigned, and be more ambitious and persistent. At the same time, we might target the way children interpret their success and failure – by teaching them about growth mindsets and the value of hard work as opposed to innate abilities and talents. This would help them to develop a more positive sense of self-efficacy and not to give up quickly when faced with a challenge and having experienced initial failure.

Finally, our proposed framework might be helpful in cognitive therapy settings, as it facilitates targeting maladaptive appraisals by addressing issues underlying them. Such traumatic life experiences as, for instance, domestic abuse, facing unemployment, bankruptcy or insolvency, substance abuse, or experiences of being bullied, are all associated with the loss of control and perceived inability to exert power to change one's situation for the better. Our knowledge of how self-efficacy beliefs, responsible for maladaptive appraisals, can be changed, and implementation of those practices in therapy settings, can empower individuals and improve their quality of life.

In conclusion, in this paper we presented some initial work that attempts to provide additional insight and structure into the question of appraisal inter-individual variability and its intra-individual stability over time. While we used the appraisal of problem-focused coping potential as a case in this article, we are certain that individual differences in appraisals along other dimensions are likely related to stable predispositions analogous to self-efficacy beliefs, and while the content of such predispositions is different, the mechanisms underlying their role in appraisals are likely to be uniform. We believe that a more in-depth analysis of the relationship between individual predispositions and relevant appraisals will advance our understanding of individual differences in emotional reactions. This understanding would be a key step on the way to develop effective interventions targeting maladaptive emotional reactions and improving individuals' well-being.

Manuscript 3. Do Early-Life Experiences of Economic Disadvantage Bias Judgement? The Case of Appraisal of Problem-Focused Coping Potential and Attribution of Success and Failure⁴

Experiences of economic hardship in childhood have been linked with a variety of negative outcomes in later life. Among other negative effects of early-life economic disadvantage, research has shown that those coming from lower socioeconomic backgrounds significantly underachieve compared to those who grew up in more fortunate circumstances, which is expressed both in terms of attained education, occupation, and earnings (Duncan et al., 2010).

Existing literature allows us to identify three possible explanations of the negative link between socioeconomic status in childhood and later-life attainment. The first (sociological) perspective centres around the unequal access to social and cultural capital among those who belong to different social strata (Bourdieu, 1986; Edgerton & Roberts, 2014). The second (cognitive) perspective focuses on neurocognitive development and underscores the disparity in executive function between children coming from poorer and more well-off families (Evans & Fuller-Rowell, 2013; Evans & Rosenbaum, 2008; Evans & Schamberg, 2009; Farah et al., 2006; Hackman & Farah, 2009; Hackman, Farah, & Meaney, 2010). The third (individual differences) perspective explains the lack of attainment among those coming from a lower socioeconomic background by their maladaptive control and mastery beliefs (Cidade et al., 2016; Greene & Murdock, 2013; Kane, 1987; Lewis, 1966; Pepper & Nettle, 2017).

Despite these three perspectives greatly advancing our understanding of the relationship between early-life economic disadvantage and achievement in later life, there are some limitations that call for a more in-depth analysis of the processes underlying this relationship. In particular, neither of the first two perspectives accounts for the children's own experiences and their subjective interpretations, which are likely to play a vital role in decision-making and behaviours that eventually lead to achievement. In that sense, the third perspective is complementary as it focuses on personal beliefs – cognitive structures that represent internalised experiences. While this approach is promising, it needed further delineation as

⁴ Olga Poluektova designed the instrument, ran the study, analysed the data, and wrote up the manuscript. The study design was developed in collaboration with Arvid Kappas. The programming was done with Aditya Dandekar.

such general and unspecific beliefs are unlikely to directly impact decision-making and behaviour resulting in achievement, as such behaviour is always bound to specific situations and is influenced by a wide variety of factors.

I believe that in order to better understand the link between early-life economic disadvantage and achievement, it would be useful to focus on more specific and more proximal to achievement-oriented decision-making and behaviour psychological processes. Decisions and behaviours in the achievement domain are usually preceded by a set of judgements that relate to the assessment of one's available resources and constraints. Such judgements, which I will further refer to as the appraisal of problem-focused coping potential, represent a complex process of integrating information from different sources, and are expressed in the degree of confidence individuals have regarding their ability to deal with a situation or task at hand. Because problem-focused coping potential accounts for both dispositional (e.g., perceived ability) and situational (e.g., difficulty of the task) influences, investigating the effects of childhood socioeconomic status on the appraisal of problem-focused coping potential would allow for a more in-depth insight into how early-life experiences of economic disadvantage might shape decisions and behaviours related to achievement.

Another judgement that is crucial to achievement-oriented behaviour, and that likely informs problem-focused coping potential, is the attribution of success and failure. Albert Bandura, in his discussion of the role of past mastery experiences in the personal efficacy judgement formation (Bandura, 1997, p. 93), emphasized that what matters in this process is not the objective success that one might have experienced, but its subjective interpretation, or attribution of this success to either internal (e.g., ability) or external (e.g., chance) factors. If one attributes success to external factors that they have no control over, they are unlikely to appraise their coping potential as high.

In this manuscript, I argue that early-life experiences of economic disadvantage have the potential to bias the process of the appraisal of problem-focused coping potential and the way people make attributions of success and failure. The strength of this bias depends on the ambiguity of the situation and the difficulty of the task one is faced with. Self-efficacy beliefs that are shaped by socialisation in certain socioeconomic environment serve as a main source of this bias. I present an online quasi-experimental study that tested the role of early-life economic disadvantage in the appraisal of problem-focused coping potential and attribution of

success and failure at solving a cognitive task. In doing so, I attempt to develop a more refined understanding of the processes underlying the effects of early-life economic disadvantage on achievement in later life.

Socioeconomic Status in Childhood and Appraisal of Problem-Focused Coping Potential

Appraisal is a relational process that involves integrating information from different sources (Smith & Kirby, 2009). Some information is represented by internalised experiences stored in the long-term memory in the form of personal beliefs; other information refers to the parameters of the task at hand or the situation in which the appraisal takes place. The appraisal of problem-focused coping potential is influenced by one's beliefs about their ability (self-efficacy) and such situational parameters as, for instance, task difficulty.

To understand the role of socioeconomic background in the appraisal of problem-focused coping potential, one would first need to turn to the research on the link between socioeconomic status, mastery experiences and associated self-efficacy beliefs. Further, it is important to explore how such beliefs interact with the situation and task parameters – another source of information participating in appraisal. This part is particularly important for our understanding of the psychological mechanism underlying the effects of childhood socioeconomic status and specificity of its effects.

As for the link between socioeconomic background and mastery, many researchers have connected socioeconomic status with fatalism, external locus of control, low sense of control and personal mastery (Billings, 1974; Cidade et al., 2016; Greene & Murdock, 2013). In addition, it is possible to identify a variety of mechanisms that explain how economic disadvantage contributes to the development of lower self-efficacy beliefs. Economic disadvantage has been linked with less cognitively stimulating environment and resulting slower cognitive development and school performance (Brooks-Gunn & Duncan, 1997; Rosen, Hagen, Lurie, Miles, Sheridan, Meltzoff, & McLaughlin, 2020). Additionally, children from disadvantaged families are more likely to attend school where the share of underachievers is higher (e.g., Hochschild, 2003). Being exposed to these kinds of environments is likely to negatively inform children's self-efficacy beliefs. Finally, poorer parents often have lower expectations and aspirations regarding their children's future (Sewell & Shah, 1968; Smyth,

2018; Watson, Vernon, Seddon, Andrews, & Wang, 2016) which also might predispose children to developing lower self-efficacy beliefs.

Literature on selective exposure and the role of pre-existing beliefs in cognitive processes can help explain how self-efficacy beliefs actualize in the situation when the appraisal of problem focused coping potential takes place, i.e., when one is faced with a challenging task. Selective exposure research (e.g., Hart et al., 2009) suggests that people favour information that is consistent with their pre-existing beliefs. Research on the role of pre-existing beliefs and cognitive schemata in cognitive processes (Axelrod, 1973; Markus, 1977) explains why this might be the case. Pre-existing beliefs guide the way people pay attention and retrieve information from memory, with the belief-congruent information more easily attended to. Thus, it is likely that when one is appraising their problem-focused coping potential, they are guided by their pre-existing self-efficacy beliefs in how they attend to and interpret immediate information about the situation and the task. The fact that appraisal can be an automatic process and often formed as a result of associative information processing (Arnold, 1960; Kappas, 2001; Kappas, 2006; Lazarus, 1991; Leventhal & Scherer, 1987; Moors, 2010; Smith & Kirby, 2000) makes it even more plausible.

There can, however, be scenarios in which childhood socioeconomic status and self-efficacy beliefs should not affect the appraisal of problem-focused coping potential. These are situations that present one with the information about the task that is very straightforward and unambiguous. Past research, for instance, has found that appraisals of problem-focused coping potential did not vary as a function of ability when the task was very easy (Smith & Kirby, 2009b). Similarly, it was suggested that there would likely be no variance in the appraised coping potential if the task was either very easy or very difficult (Kappas, 2001). In such cases, the appraisal would be high (easy task) and low (difficult task) for everyone, regardless of their predispositions. Following these lines of argument and the results of the previous research, I expect that *childhood socioeconomic status will have a positive effect on the appraisal of problem-focused coping potential, however, this effect will only be significant when one is faced with a moderately difficult (ambiguous) task, and nonsignificant when one is faced with easy and difficult (unambiguous) tasks (H1). The positive effect of socioeconomic status will be mediated by self-efficacy beliefs (H2).*

There is, however, one important addition to the discussion of the link between socioeconomic status in childhood and the appraisal of problem-focused coping potential. Research on cognitive biases has consistently shown that negative and positive information is weighted differently, with higher value given to negative information (Ito et al., 1998; Rozin & Royzman, 2001). At the same time, studies have found that individual differences play a role in this bias, making some more susceptible to it than others (Ashare et al., 2013; Ito & Cacioppo, 2005; Norris et al., 2011). It is thus important to test whether individual difference related to socioeconomic status in childhood have an effect on how the information about success and failure at the task is processed and interpreted.

Socioeconomic Status in Childhood and Attribution of Success and Failure

One of the central themes in the literature on attribution processes is self-serving bias (Bradley, 1978; Miller & Ross, 1975; Zuckerman, 1979). Numerous studies have shown that people tend to take credit for positive outcomes and blame external to them factors for negative outcomes. A meta-analysis of 266 studies concluded that although the bias demonstrates significant variability across age, culture and psychopathology, it is pervasive in the general population (Mezulis et al., 2004).

There are, however, reasons to believe that self-serving bias would be less pronounced in people with lower socioeconomic backgrounds. First, people with lower social class backgrounds are more likely to have more external locus of control (Kraus et al., 2010; Maqsd & Rouhani, 1991; Pedron et al., 2020; Shifrer, 2019) and, as a result, might make more external attributions in general. Second, some research has shown that people with lower socioeconomic status are more likely to be more collectivist (Manstead, 2018). People coming from collectivist cultures do not necessarily construe their self-esteem through individual achievement, but rather view group achievements as more important to their sense of competence (Sedikides et al., 2003). Third, self-serving bias seems to be stronger when the task is perceived as more important (Shepperd et al., 2008). It might be that people coming from higher status families see performing at a cognitive task as more important as their self-concept depends on this kind of “intellectual” activity more than self-concept of people coming from lower social class backgrounds. Finally, evidence suggests that people with negative self-views are less inclined to show the self-serving bias (Mezulis et al., 2004). As poverty and

economic disadvantage has been often linked with the development of negative self-views, it is likely that these self-schemata would mean less pronounced self-serving bias in those coming from power economic backgrounds.

In addition to the absence of self-serving bias in people coming from lower socioeconomic backgrounds, there are reasons to believe that these people would be prone to a reverse bias in attributions. For instance, research has shown that, when explaining their success or failure at a task, individuals tend to make attributions in congruence with their self-schemata of ability, i.e., people with negative self-schemata making more internal attributions for failure and more external for success (Taylor & Boggiano, 1987). These findings are in line with broader research on the role of self-schemata in information processing (e.g., Markus, 1977), and lead me to expect that *socioeconomic status will be positively associated with the tendency to explain success with internal factors and failure with external, however, this effect will only be significant in the unambiguous situation (H3). The effects of socioeconomic status will be mediated by self-efficacy beliefs (H4).*

Method

Participants

A total of 250 residents of the United Kingdom (89% living in England) participated in an online study. All participants were recruited via the Lightspeed Research online panel and received compensation for their participation. As the effects of economic disadvantage in childhood were of primary interest to this study, I used quota-based sampling aiming to ensure that 50% of the participants had grown up in economically challenged families. Additionally, 59% of the sample were females, 58% had earned a university degree, 4% were coming an ethnic minority background. I limited the age range of the participants to 22-35 years to ensure that their experiences of economic disadvantage were relatively uniform and recent. 45% of participants were between 22 and 25 years, 22% - between 26 and 29. Most of the participants (87%) had previous experiences with Sudoku – the cognitive task that they solved as part of the study; however, only 27% of the sample solved Sudoku puzzles regularly. Nine participants failed to pass the attention check and three guessed what the actual purpose of the study was. These individuals were eliminated from the sample.

Procedure

The study employed a mixed quasi-experimental design. The participants were invited to take part in a study on the performance at cognitive tasks. The actual aim of the study was not revealed at the beginning, to avoid bias in the answers. All participants provided informed consent prior to the participation. The participation involved filling out a questionnaire on socioeconomic background and self-efficacy beliefs, solving six cognitive tasks (two easy, two moderate, and two difficult) with a time limit, and, after attempting to solve each pair of tasks, completing a variety of items assessing thoughts, feelings and expectations regarding the tasks. The pairs of tasks (easy, moderate, difficult) were presented in a counterbalanced order.

In total, participation took around 20 minutes. At the end of their participation, I revealed the actual aim, hypothesis, and research question of the study. All participants had an opportunity to retract their data and get in touch in case they had any questions or concerns.

Cognitive Task

The cognitive task I used was a letter Sudoku puzzle. I chose letter Sudoku instead of the more traditional numerical version with numbers to minimize the likelihood of the participants' experiencing Math-related anxiety that could potentially impact their performance and bias their responses on appraisal questions. The puzzles were generated using a Sudoku generator. Each puzzle had a 2x3 grid with 36 cells, 21 of which were pre-filled and 15 remained missing. An example of the puzzle is presented below (Figure M3.1).

As two of the main questions of the study concerned with the role of childhood socioeconomic status in problem-focused coping potential across tasks with different difficulty and among those who succeeded and failed, it was necessary to ensure that the easy and difficult tasks would be perceived as such and that the vast majority of the participants would (easy) or would not (difficult) be able to solve them. The moderate task should have been less straightforward in terms of difficulty with a good share of participants succeeding at it, but also a share of those who would fail. Setting different time limits for the easy, moderate, and difficult tasks would ensure that.

Figure M3.1

An Example of a Letter Sudoku Puzzle Solved by the Participants

| | | | | | |
|---|---|---|---|---|---|
| D | | C | A | E | B |
| B | | | E | | F |
| E | C | B | F | A | |
| F | | A | C | | E |
| | D | E | | F | A |
| A | E | F | D | | C |

To choose the puzzles for the main study and decide on the time limits, I conducted a pretest on a sample of 93 people with diverse backgrounds and experiences. The participants were presented with six letter Sudoku puzzles and had 300 seconds to attempt to solve each of those. 80% of the sample took between 62 and 77 seconds to solve each puzzle. The minimum time for the puzzle solution was 34 seconds, and maximum time – 139 seconds.

The two puzzles with the smallest standard deviation in solution time were chosen. The time limits were set at 2 minutes and 30 seconds for the easy task, 70 seconds for the moderate task, and 30 seconds for the difficult task. Taking the median time as the time limit for the moderate task would mean that approximately half of the participants of the main study would succeed at the puzzle solution and half would fail. However, the margin of success or failure would be not too large, and that would ensure the relative ambiguity of success and failure experiences that I aimed for in the moderate task.

Measures

Socioeconomic Status in Childhood

Childhood socioeconomic status was assessed by means of a three-item measure by Griskevicius et al. (2011). Sample item: “My family usually had enough money when I was growing up” (rated from 1 = “Strongly disagree” to 5 = “Strongly agree”). Furthermore, I used the items adapted from the “Economic Deprivation Scale” by Schwartz et al. (1997). Sample item: “We could afford to heat living areas at home, when it was cold” (0 = No; 1 = Yes).

Finally, I asked the participants to indicate their parents' educational levels and social class background to ensure that the retrospective self-report of childhood socioeconomic is reliable.

Self-Efficacy Beliefs

To assess self-efficacy beliefs, we used the generalised self-efficacy scale (Schwarzer & Jerusalem, 1995). The scale consisted of ten items that comprised a single factor. Sample item: "I believe I can succeed at most any endeavour to which I set my mind (0 = Not at all; 8 = absolutely). The scale was internally consistent (Cronbach's alpha = .86).

Appraisal of Problem-Focused Coping Potential

The participants were presented with a letter Sudoku puzzle, which was almost identical to the ones they had previously solved and asked to indicate their confidence to solve this task having either 2 minutes 30 seconds (easy task), or 70 seconds (moderate task), or 30 seconds (difficult task) of available time. The responses were given on a 9-point Likert scale (0 = not confident at all; 8 = very confident). Problem-focused coping potential was assessed three times, after the participants had attempted to solve each pair of tasks.

Emotional States⁵

The participants were asked to indicate to what extent they felt each of the nine emotions. The responses were given on a 9-point Likert scale (0 = did not feel like that at all; 8 = felt so to a great extent). The emotional states presented to the participants were theoretically linked with the appraisal of problem-focused coping potential. They were challenge, nervousness, confidence, hope, anxiety, interest, boredom, sadness, and resignation. Like the appraisal, emotional states were assessed three times, after the participants had attempted to solve each series of tasks.

⁵ I was primarily interested in the role of childhood socioeconomic status in the appraisal and attribution; its effects on the emotional states were not central to this study. However, the inclusion of emotional states that are theoretically associated with the appraisal of problem-focused coping potential allowed me to assess the predictive validity of the appraisal measure and provide an additional insight into what the emotional consequences of low socioeconomic status in childhood might be.

Attribution of the Outcome

The participants indicated to what extent they believed each of the three proposed reasons contributed to their success or failure at solving the tasks. The responses were given on a 9-point Likert scale (0 = did not feel like that at all; 8 = felt so to a great extent). The reasons represented internal unstable attribution (effort), internal stable attribution (ability), and external attribution (chance/luck). Attribution was assessed three times, after each series of tasks.

Background Measures

The participants indicated their gender, age, education, and past experiences with Sudoku.

Analytical Strategy

The analyses involved several stages. First, I ran a few tests to ensure that the assessment of socioeconomic status in childhood was valid and that the manipulation of difficulty worked, and to check whether socioeconomic status in childhood is confounded with any other variables that affect appraisal but are not part of my theoretical model. I also conducted principal components analysis to reduce emotional states to fewer categories. Second, I tested my hypotheses related to the effects of childhood socioeconomic status on the appraisal of problem-focused coping potential at tasks with difficult difficulty and among those who succeeded and failed at a moderate task. I used linear mixed models to test the interaction between socioeconomic status in childhood and task difficulty, and simple linear models to test the interaction between socioeconomic status and success versus failure at a moderate task. Mixed models represent an extension of simple linear models and allow for both fixed and random effects. They are usually used when there is no independence in the data, for example, when the participants are surveyed more than once (like in this study – all participants solved three pairs of tasks with different difficulty) and are considered superior to repeated measures ANOVA. In all linear mixed models, I used a simple coding scheme for the categorical independent variable (task difficulty), meaning that the comparison was with a reference category mean (difficult task). At the third stage of the analysis, I ran mediation analyses to

test the role of self-efficacy beliefs in the relationship between socioeconomic status in childhood and appraisal of problem-focused coping potential.

Results

Preliminary Analyses

My main aims at the preliminary stage of analysis were as follows. First, I needed to ensure that the assessment of childhood socioeconomic status was valid. Second, I planned to reduce the number of emotional states from nine to a more manageable number. Third, I needed to understand whether I can rule out the alternative explanations of the relationship between childhood socioeconomic status and appraisal of problem-focused coping potential, or there are factors that need to be statistically controlled for in the main analysis. Fourth, I intended to check whether the manipulation of task difficulty had worked as planned.

Assessing childhood socioeconomic status using retrospective self-report often incurs validity concerns. Thus, it was necessary to ensure that the assessment was valid and could be used in the main analysis. As part of the study, I collected the data on participants' family situation during their childhood, including information regarding their parents' education levels, social class, and levels of deprivation. I analysed the relationships between the scores on the childhood socioeconomic status scale and scores on those variables. Multiple linear regression analysis revealed significant positive effects of mother having a university degree ($\beta = .312, p = .026$) and family of origin belonging to the middle class ($\beta = .435, p < .001$) and significant negative effect of deprivation ($\beta = -.391, p < .001$) on self-reported socioeconomic status in childhood. The effect of father's education was nonsignificant ($\beta = -.031, p < .801$). As seen from the analysis, retrospective childhood socioeconomic status is associated with other socioeconomic variables in meaningful ways, although the strength of these relationships is moderate (this could be due to an extra-layer of meanings associated with one's subjective perceptions of their position vis-à-vis others). Based on the pattern of observed relationships, I concluded that using the measure of childhood socioeconomic status in the main analysis is appropriate.

As part of the study, the participants indicated to what extent they experienced each of the listed emotional states – all were theoretically associated with the appraisal of problem-focused coping potential – while solving the puzzles. The total number of these states was nine.

Due to the fact they were so many, and because many of them were conceptually close to each other (e.g., nervousness and anxiety), it was not feasible to run nine separate analyses to estimate the effects of socioeconomic status in childhood on those nine emotional states. So, the task was to reduce them to a more manageable number. To achieve that aim, I analysed the patterns of correlations between them and ran a principal component analysis. The results of the correlation analysis showed that the pattern of relationships of different emotional states with each other, and with the appraisal of problem-focused coping potential, is largely consistent with the theory (Tables M3A1–M3A3). For instance, anxiety was rather strongly associated with nervousness, sadness – with resignation, and confidence – with hope. Furthermore, as expected, hope and confidence were positively associated with appraisal of problem-focused coping potential, and resignation – negatively. One exception was challenge: I expected that it would be positively associated with appraisal, but instead the results indicated negative association. The subsequent principal components analysis suggested a three-factor solution (Tables M3A4-M3A6), which would account for approximately 73% of the variance (between 72 and 74% across three assessments). The first component included feelings of nervousness, anxiety, and challenge. The second component included feelings of boredom, sadness, and resignation. The third component included feelings of hope, confidence, and interest. Based on this solution and conceptual considerations, I combined nervousness and anxiety into one factor, to which I refer as ‘Anxiety’ further in text. I excluded challenge on theoretical grounds. Further, I combined sadness and resignation (‘Resignation’ further in text), as well as hope and confidence (‘Optimistic feelings’ further in text). I treated interest and boredom and two separate dependent variables representing engagement and disengagement.

In this study, I proposed that the effects of socioeconomic status in childhood on the appraisal of problem-focused coping potential can be explained by self-efficacy beliefs. To conclude that, it was necessary to isolate other possible mechanisms. Such mechanisms could be, for instance, (1) people with higher childhood socioeconomic status had more experiences with Sudoku in the past and feel more competent at solving Sudoku, and (2) people with higher socioeconomic status in childhood, due to their higher working memory capacity, are better (quicker) at solving Sudoku puzzles. Correlation analysis showed that socioeconomic status in childhood was positively associated with having solved Sudoku in the past ($r = .220, p < .001$),

indicating that the participants coming from higher status families were more familiar with Sudoku puzzles and had more experiences solving them compared to those coming from lower status families. That meant that past experiences with Sudoku needed to be statistically controlled for in the main analyses. Speaking about actual ability to solve Sudoku, socioeconomic status in childhood was not significantly associated with the solution time of easy ($r = -.005, p = .958$) and moderate ($r = -.002, p = .973$) tasks. Furthermore, socioeconomic status in childhood did not predict whether one would be successful at moderate task (OR = 1.03, $p = .862$). Thus, it can be concluded that the participants with lower and higher levels of socioeconomic status in childhood did not differ in their ability to solve Sudoku.

Further analyses showed that the manipulation of the task difficulty was largely effective. 89% of all participants successfully solved easy tasks, and 60% successfully solved moderate tasks. No one managed to solve the difficult task. Average solution times for the easy and moderate tasks were 69 and 53 seconds, respectively. The mean levels of perceived difficulty for the easy, moderate, and difficult tasks were 2.32, 4.15, and 6.74, respectively, and the effect of condition was significant [$F(2, 476) = 367, p < .001$]. Finally, the order in which the tasks were presented did not affect any of the dependent variables.

The Effects of Socioeconomic Status in Childhood on the Appraisal of Problem-Focused Coping Potential

Across Tasks with Different Difficulty Levels

The results revealed significant main effects of socioeconomic status in childhood and task difficulty, as well as the significant interaction effect (Table M3.1). Increased task difficulty was associated with lower levels of problem-focused coping potential. In line with the predictions, higher levels of socioeconomic status in childhood were associated with higher levels of the appraisal of problem-focused coping potential. Previous experience with Sudoku – the control variable – also significantly predicted problem-focused coping potential, with the participants with more experience in the past being more likely to appraise their coping potential as higher.

Table M3.1

The Effects of Socioeconomic Status in Childhood, Task Difficulty, and their Interaction on the Appraisal of Problem-Focused Coping Potential. Linear Mixed Model.

| Effect | Omnibus tests | | | Parameter estimates | | | | |
|--------------------------|---------------|-----------|----------|---------------------|------|-----------|----------|----------|
| | <i>F</i> | <i>df</i> | <i>p</i> | Estimate | SE | <i>df</i> | <i>t</i> | <i>p</i> |
| (Intercept) | | | | 4.78 | 0.09 | 233 | 52.24 | < .001 |
| Childhood SES | 13.85 | 1, 233 | < .001 | 0.33 | 0.09 | 233 | 3.72 | < .001 |
| Task difficulty | 335.62 | 2, 468 | < .001 | | | | | |
| Easy – Difficult | | | | 3.62 | 0.15 | 468 | 25.15 | < .001 |
| Moderate – Difficult | | | | 2.60 | 0.15 | 468 | 17.97 | < .001 |
| SES * Task difficulty | 5.53 | 2, 468 | .004 | | | | | |
| SES * Easy-Difficult | | | | -0.45 | 0.14 | 468 | -3.31 | .001 |
| SES * Moderate-Difficult | | | | -0.19 | 0.14 | 468 | -1.36 | .175 |
| Past Sudoku experiences | 21.40 | 2, 233 | < .001 | 0.45 | 0.10 | 233 | 4.63 | < .001 |

Significant interaction effect indicated that the effect of socioeconomic status in childhood was non-uniform across tasks with different levels of difficulty. Simple effects analysis revealed that the effect of childhood status was only significant when the participants solved moderate [$F(1, 570) = 9.047, p = .003$] and difficult [$F(1, 570) = 20.890, p < .001$] tasks, but not the easy one [$F(1, 570) = 0.582, p = .446$]. When solving moderate and difficult tasks, childhood status positively predicted problem-focused coping potential. Figure M3.2 presents the regression lines illustrating the relationship between childhood status and the appraisal of problem-focused coping potential at the tasks with different levels of difficulty.

As for the effects of socioeconomic status in childhood on emotional states, they were mostly nonsignificant. The only marginally significant effect was on the feelings of optimism – higher levels of socioeconomic status were associated with higher levels of feeling optimistic when solving the task. On the contrary, task difficulty significantly predicted feelings of engagement (interest and boredom), resignation, anxiety, and optimism. The participants felt less optimistic, more anxious, and more resigned dealing with more difficult tasks. Additionally, the participants reported higher levels of boredom and lower levels of interest solving more difficult tasks. Although the results revealed significant interaction effect of task difficulty and socioeconomic status in childhood on interest, a follow-up simple effects analysis did not reveal significant effects of childhood socioeconomic status on interest at any level of task difficulty. The results are summarized in Table M3.2.

Figure M3.2

The Relationship between Socioeconomic Status in Childhood and the Appraisal of Problem-Focused Coping Potential across the Tasks with Different Levels of Difficulty

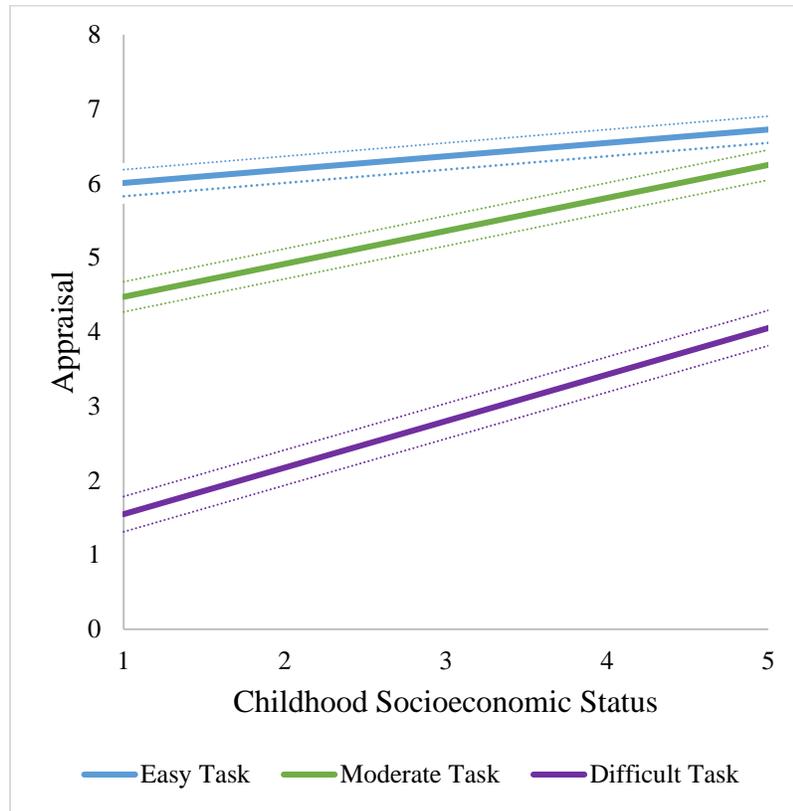


Table M3.2

The Effects of Socioeconomic Status in Childhood, Task Difficulty, and their Interaction on the Emotional States. Linear Mixed Model.

| Effect | Omnibus tests | | | Parameter estimates | | | | |
|------------------------------|---------------|-----------|----------|---------------------|-------|-----------|----------|----------|
| | <i>F</i> | <i>df</i> | <i>p</i> | Estimate | SE | <i>df</i> | <i>t</i> | <i>p</i> |
| INTEREST | | | | | | | | |
| (Intercept) | | | | 5.673 | 0.104 | 233 | 54.363 | < .001 |
| Childhood SES | 0.01 | 1, 233 | .954 | 0.006 | 0.101 | 233 | 0.057 | .954 |
| Task difficulty | 13.70 | 2, 467 | < .001 | | | | | |
| Easy – Difficult | | | | 0.458 | 0.108 | 467 | 4.228 | < .001 |
| Moderate – Difficult | | | | 0.519 | 0.108 | 467 | 4.784 | < .001 |
| SES * Task difficulty | 5.87 | 2, 467 | .003 | | | | | |
| SES * Easy-Difficult | | | | -0.262 | 0.103 | 467 | -2.553 | .011 |
| SES * Moderate-Difficult | | | | 0.072 | 0.103 | 467 | 0.703 | .482 |
| Past experiences with Sudoku | 3.89 | 1, 233 | .056 | 0.218 | 0.111 | 233 | 1.973 | .056 |

MANUSCRIPT 3. CHILDHOOD SES, APPRAISAL AND ATTRIBUTION

| Effect | Omnibus tests | | | Parameter estimates | | | | |
|------------------------------|---------------|-----------|----------|---------------------|-------|-----------|----------|----------|
| | <i>F</i> | <i>df</i> | <i>p</i> | Estimate | SE | <i>df</i> | <i>t</i> | <i>p</i> |
| BOREDOM | | | | | | | | |
| (Intercept) | | | | 2.047 | 0.125 | 233 | 16.36 | < .001 |
| Childhood SES | 2.48 | 1, 233 | .117 | 0.191 | 0.121 | 233 | 1.57 | .117 |
| Task difficulty | 10.02 | 2, 467 | .001 | | | | | |
| Easy – Difficult | | | | -0.521 | 0.117 | 467 | -4.46 | < .001 |
| Moderate – Difficult | | | | -0.304 | 0.117 | 467 | -2.59 | .010 |
| SES * Task difficulty | 1.83 | 2, 467 | .162 | | | | | |
| SES * Easy-Difficult | | | | -0.164 | 0.111 | 467 | -1.49 | .138 |
| SES * Moderate-Difficult | | | | -0.198 | 0.111 | 467 | -1.78 | .075 |
| Past experiences with Sudoku | 2.23 | 1, 233 | .137 | -0.198 | 0.133 | 233 | -1.49 | .137 |
| OPTIMISM | | | | | | | | |
| (Intercept) | | | | 4.782 | 0.094 | 233 | 51.09 | < .001 |
| Childhood SES | 4.07 | 1, 233 | .045 | 0.183 | 0.091 | 233 | 2.02 | .045 |
| Task difficulty | 111.83 | 2, 468 | < .001 | | | | | |
| Easy – Difficult | | | | 1.644 | 0.114 | 468 | 14.37 | < .001 |
| Moderate – Difficult | | | | 1.231 | 0.114 | 468 | 10.76 | < .001 |
| SES * Task difficulty | 2.20 | 2, 468 | .112 | | | | | |
| SES * Easy-Difficult | | | | -0.221 | 0.108 | 468 | -2.04 | .042 |
| SES * Moderate-Difficult | | | | -0.157 | 0.108 | 468 | -1.45 | .147 |
| Past experiences with Sudoku | 7.70 | 1, 233 | .006 | 0.275 | 0.099 | 233 | 2.78 | .006 |
| RESIGNATION | | | | | | | | |
| (Intercept) | | | | 2.422 | 0.111 | 233 | 21.76 | < .001 |
| Childhood SES | 0.11 | 1, 233 | .739 | 0.036 | 0.108 | 233 | 0.33 | .739 |
| Task difficulty | 48.24 | 2, 467 | < .001 | | | | | |
| Easy – Difficult | | | | -1.106 | 0.115 | 467 | -9.64 | < .001 |
| Moderate – Difficult | | | | -0.743 | 0.115 | 467 | -6.46 | < .001 |
| SES * Task difficulty | 0.90 | 2, 467 | .409 | | | | | |
| SES * Easy-Difficult | | | | 0.093 | 0.109 | 467 | 0.86 | .392 |
| SES * Moderate-Difficult | | | | -0.050 | 0.109 | 467 | -0.46 | .644 |
| Past experiences with Sudoku | 8.73 | 1, 233 | .003 | -0.349 | 0.118 | 233 | -2.95 | .003 |
| ANXIETY | | | | | | | | |
| (Intercept) | | | | 3.689 | 0.128 | 233 | 28.84 | < .001 |
| Childhood SES | 3.36 | 1, 233 | .068 | -0.218 | 0.136 | 233 | -1.61 | .109 |
| Task difficulty | 68.82 | 2, 468 | < .001 | | | | | |
| Easy – Difficult | | | | -1.318 | 0.115 | 468 | -11.50 | < .001 |
| Moderate – Difficult | | | | -0.428 | 0.115 | 468 | -3.74 | < .001 |
| SES * Task difficulty | 1.01 | 2, 468 | .366 | 0.098 | 0.108 | 468 | 0.90 | .368 |
| SES * Easy-Difficult | | | | | | | | |
| SES * Moderate-Difficult | | | | -0.054 | 0.108 | 468 | 0.50 | .619 |
| Past experiences with Sudoku | 2.59 | 1, 233 | .109 | -0.218 | 0.136 | 233 | -1.61 | .109 |

The Effects of Childhood Status on the Appraisal of Problem-Focused Coping Potential at a Moderate Task among the Participants who Failed and Succeeded

The results revealed significant main effects of socioeconomic status in childhood and of success versus failure at the moderate task. Higher levels of childhood status, as well as being successful at the task, predicted higher levels of problem-focused coping potential. The effect of past experiences with Sudoku was nonsignificant. The interaction effect between childhood socioeconomic status and success versus failure was significant. The results are presented in Table M3.3.

Table M3.3

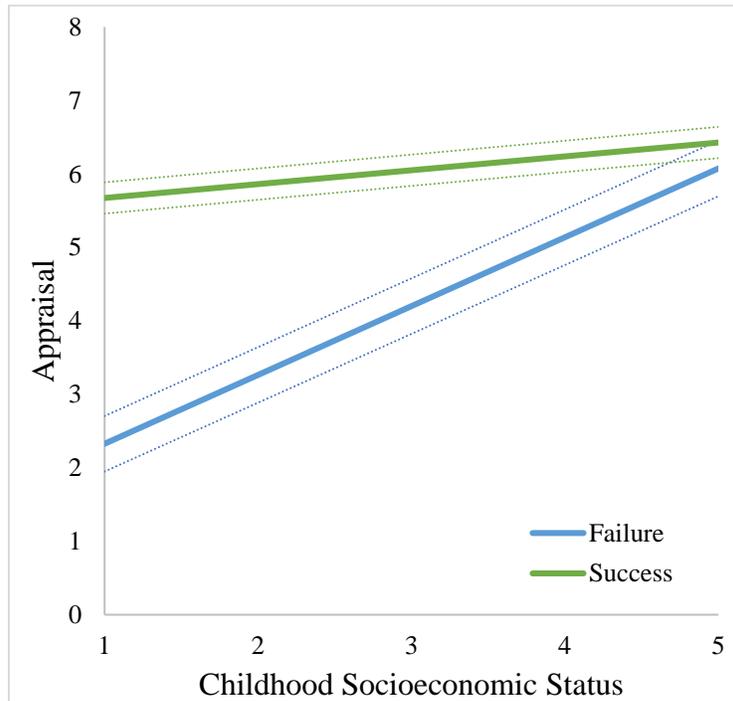
The Effects of Socioeconomic Status in Childhood, Outcome on a Task, and their Interaction on Problem-Focused Coping Potential. General Linear Model

| Effect | ANOVA omnibus test | | | | Parameter estimates | | | |
|------------------------------|--------------------|-----------|----------|-----------|---------------------|-----------|----------|----------|
| | <i>F</i> | <i>df</i> | <i>p</i> | η^2p | Estimate | <i>SE</i> | <i>t</i> | <i>p</i> |
| (Intercept) | | | | | 5.028 | 5.028 | 41.33 | < .001 |
| Childhood SES | 19.63 | 1, 201 | < .001 | .089 | 0.520 | 0.520 | 4.43 | < .001 |
| Success at moderate task | 58.86 | 1, 201 | < .001 | .227 | 1.918 | 1.918 | 7.67 | < .001 |
| SES * Success | 8.99 | 1, 201 | .003 | .043 | -0.688 | -0.688 | -3.00 | .003 |
| Past experiences with Sudoku | 4.38 | 1, 201 | .201 | .008 | 0.162 | 0.162 | 1.28 | .201 |

Follow-up simple effects analysis showed that the effect of childhood socioeconomic status on appraisal was significant only in the group of participants who failed to solve the task [$F(1, 201) = 21.68, p < .001$], but not among those who succeeded [$F(1, 201) = 1.59, p < .209$]. Among the participants who failed the task, childhood status positively predicted appraisal of problem-focused coping potential. Figure M3.3 presents regression lines illustrating the effects of childhood socioeconomic status on appraisal in the situations of success and failure.

Figure M3.3

The Effects of Socioeconomic Status in Childhood on the Appraisal of Problem-Focused Coping Potential among the Participants who Succeeded (n=141) and Failed (n=98) the Moderate Task.



The Effects of Socioeconomic Status in Childhood on the Attribution of the Outcome Across Tasks with Different Difficulty Levels

Internal Unstable (Effort). The results revealed a significant main effect of puzzle difficulty, with the participants being more likely to explain their success or failure with effort when solving easier tasks. Main effects of childhood status and previous experiences with Sudoku were nonsignificant. The interaction effect of task difficulty and childhood status was significant. The results are presented in Table M3.4.

Simple effects analysis showed that the effect of socioeconomic status in childhood was marginally significant in the difficult task condition [$F(1, 542) = 3.62, p = .051$], and insignificant in the easy [$F(1, 542) = 0.98, p = .323$] and moderate [$F(1, 542) = 1.94, p = .163$] conditions. In the difficult task condition, higher socioeconomic status in childhood was associated with lower likelihood to explain the outcome by effort. Figure M3.4a presents the

regression lines illustrating the relationship between childhood status and explaining the outcome with effort at the tasks with different levels of difficulty.

Internal Stable (Ability). Significant main effects of puzzle difficulty and previous experiences with Sudoku were identified. The participants were less likely to explain their outcome with ability as the difficulty of the task increased. Having more previous experiences with Sudoku was associated with higher tendency to explain the outcome with ability. The main effect of childhood status was insignificant; however, the interaction effect of task difficulty and childhood status was significant. The results are presented in Table M3.4.

Simple effects analysis did not reveal significant effects of childhood socioeconomic status on any of the task difficulty levels, despite the significant interaction effect. However, the trends were in the predicted directions and in line with other findings. In the difficult task condition, the effect of childhood status on explaining the outcome with ability was negative [$F(1, 500) = 2.68, p = .101$]. The effects of childhood status in easy [$F(1, 500) = 1.30, p = .245$] and moderate [$F(1, 500) = 0.11, p = .779$] conditions were positive. Figure M3.4b presents the regression lines illustrating the relationship between childhood status and explaining the outcome with ability at tasks with different levels of difficulty.

External (Chance/Luck). The main effects of puzzle difficulty, socioeconomic status in childhood, and previous experiences with Sudoku were nonsignificant. However, the results revealed a significant interaction effect of task difficulty and childhood status. The results are presented in Table M3.4.

A follow-up simple effects analysis demonstrated that the effects of childhood status on attributing the outcome to chance were nonsignificant in easy task [$F(1, 438) = 2.55, p = .111$] and moderate task [$F(1, 438) = 0.01, p = .922$] conditions, and significant in difficult task [$F(1, 438) = 7.52, p = .006$] condition. In a difficult task condition, higher childhood status was associated with higher likelihood of attributing the outcome to chance or luck. Figure M3.4c presents the regression lines illustrating the relationship between childhood socioeconomic status and explaining the outcome with chance at the tasks with different levels of difficulty.

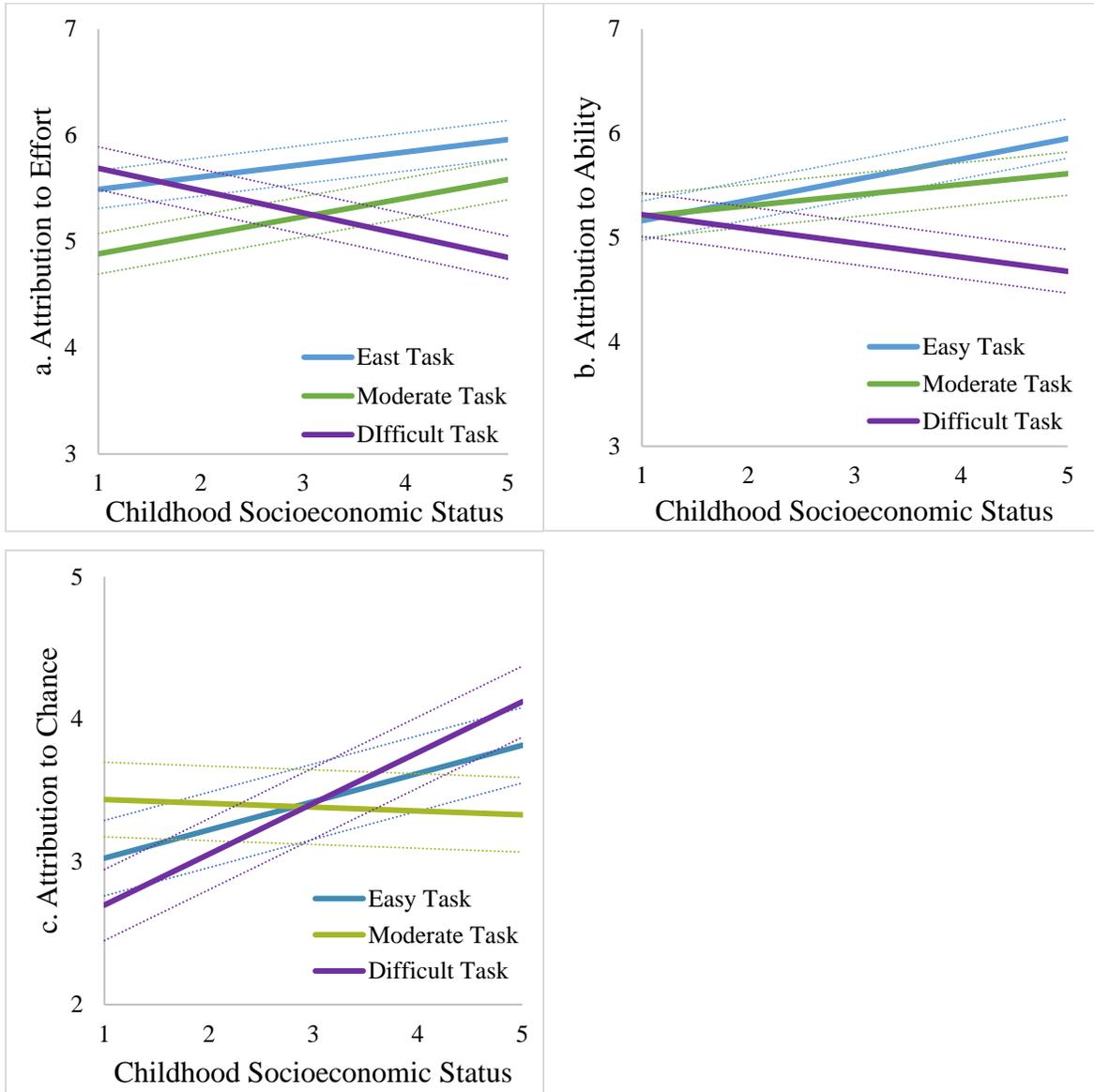
Table M3.4

The Effects of Socioeconomic Status in Childhood, Task Difficulty, and their Interaction on the Attribution of the Outcome: Linear Mixed Model

| Effect | Omnibus tests | | | Parameter estimates | | | | |
|------------------------------|---------------|-----------|----------|---------------------|-----------|-----------|----------|----------|
| | <i>F</i> | <i>df</i> | <i>p</i> | Estimate | <i>SE</i> | <i>df</i> | <i>t</i> | <i>p</i> |
| EFFORT | | | | | | | | |
| (Intercept) | | | | 5.528 | 0.090 | 233 | 61.38 | < .001 |
| Childhood SES | 0.04 | 1, 233 | .835 | 0.018 | 0.087 | 233 | 0.21 | .835 |
| Task difficulty | 4.45 | 2, 468 | .012 | | | | | |
| Easy – Difficult | | | | 0.386 | 0.134 | 468 | 2.88 | .004 |
| Moderate – Difficult | | | | 0.284 | 0.134 | 468 | 2.12 | .035 |
| SES * Task difficulty | 5.22 | 2, 468 | .006 | | | | | |
| SES * Easy-Difficult | | | | 0.330 | 0.127 | 468 | 2.60 | .010 |
| SES * Moderate-Difficult | | | | 0.376 | 0.127 | 468 | 2.96 | .003 |
| Past experiences with Sudoku | 0.01 | 1, 233 | .908 | 0.011 | 0.095 | 233 | 0.12 | .908 |
| ABILITY | | | | | | | | |
| (Intercept) | | | | 5.295 | 0.096 | 233 | 55.16 | < .001 |
| Childhood SES | 0.01 | 1, 233 | .946 | -0.006 | 0.093 | 233 | -0.07 | .946 |
| Task difficulty | 9.60 | 2, 468 | .001 | | | | | |
| Easy – Difficult | | | | 0.547 | 0.130 | 468 | 4.20 | < .001 |
| Moderate – Difficult | | | | 0.415 | 0.130 | 468 | 3.19 | .002 |
| SES * Task difficulty | 3.69 | 2, 468 | .026 | | | | | |
| SES * Easy-Difficult | | | | 0.326 | 0.123 | 468 | 2.64 | .009 |
| SES * Moderate-Difficult | | | | 0.231 | 0.123 | 468 | 1.87 | .062 |
| Past experiences with Sudoku | 9.57 | 1, 233 | .002 | 0.315 | 0.102 | 233 | 3.09 | .002 |
| CHANCE/LUCK | | | | | | | | |
| (Intercept) | | | | 3.355 | 0.130 | 233 | 25.75 | < .001 |
| Childhood SES | 3.14 | 1, 233 | .078 | 0.224 | 0.126 | 233 | 1.77 | .078 |
| Task difficulty | 0.01 | 2, 468 | .990 | | | | | |
| Easy – Difficult | | | | 0.021 | 0.152 | 468 | 0.14 | .889 |
| Moderate – Difficult | | | | 0.013 | 0.152 | 468 | 0.08 | .934 |
| SES * Task difficulty | 3.87 | 2, 468 | .021 | | | | | |
| SES * Easy-Difficult | | | | -0.174 | 0.144 | 468 | -1.20 | .229 |
| SES * Moderate-Difficult | | | | -0.400 | 0.144 | 468 | -2.78 | .006 |
| Past experiences with Sudoku | 2.88 | 1, 233 | .091 | -0.234 | 0.138 | 233 | -1.69 | .091 |

Figure M3.4

The Effects of Socioeconomic Status in Childhood on Attributing the Outcome to (a) Effort, (b) Ability, and (c) Chance across the Tasks with Different Levels of Difficulty



Note. Attribution was measured on a scale from 0 to 8.

The Effects of Socioeconomic Status in Childhood on the Attribution of the Outcome at the Moderate Task among the Participants who Failed and Succeeded

Internal Unstable (Effort). The results revealed significant positive main effect of succeeding at the task, indicating that those who succeeded were more likely to attribute their success to effort, and those who failed – less likely. The effects of childhood status and past experiences with Sudoku were insignificant, and nor was the interaction of success versus failure and childhood status. The results can be found in Table M3.5.

Internal Stable (Ability). The results revealed significant positive effect of succeeding at a task, indicating that those who succeeded at a task were more likely to explain their success with ability, and those who failed were less likely to do so. The main effects of socioeconomic status in childhood and past experiences with Sudoku were insignificant. The interaction effect of success versus failure and childhood status was significant. The results can be found in Table M3.5.

Simple effects analysis revealed that the effect of childhood status on attributing the outcome to ability was significant among those who succeeded at the task [$F(1, 201) = 4.59, p = .033$], but not among those who failed [$F(1, 201) = 2.76, p = .098$]. Among those who succeeded, childhood status positively predicted attribution of the outcome to ability (Figure M3.5a).

External (Chance/luck). The main effects of succeeding at a task, childhood status, and past experiences with Sudoku were insignificant. However, the results revealed significant interaction effect of success versus failure experiences and childhood status. Fixed effects can be found in Table M3.5.

Simple effects analysis showed that the effect of socioeconomic status in childhood was only significant among those who failed the task [$F(1, 201) = 4.38, p = .038$], but not among those who succeeded [$F(1, 201) = 4.59, p = .162$]. In the group of those who failed the task, childhood status positively predicted attribution of the outcome to luck (Figure M3.5b). Although the effect of childhood status was insignificant among those who succeeded, the trend is in line with the findings from the “success” group; here, the effect is negative.

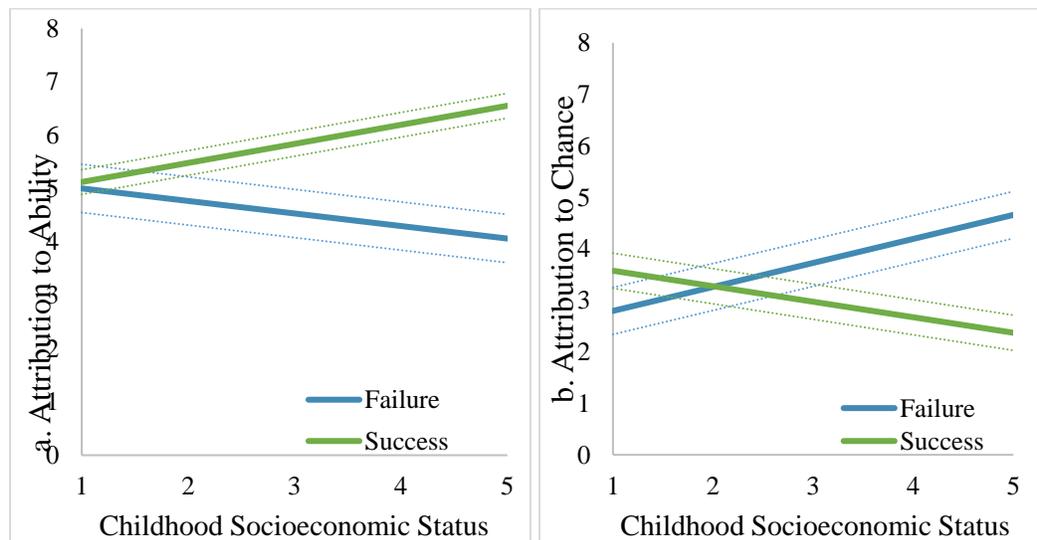
Table M3.5

The Effects of Socioeconomic Status in Childhood, Outcome on a Task, and their Interaction on the Attribution of the Outcome: General Linear Model

| Effect | ANOVA omnibus test | | | | Parameter estimates | | | |
|------------------------------|--------------------|-----------|----------|-----------|---------------------|-----------|----------|----------|
| | <i>F</i> | <i>df</i> | <i>p</i> | η^2p | Estimate | <i>SE</i> | <i>t</i> | <i>p</i> |
| EFFORT | | | | | | | | |
| (Intercept) | | | | | 5.451 | 0.143 | 38.15 | < .001 |
| Childhood SES | 0.08 | 1, 201 | .785 | .000 | 0.612 | 0.294 | 2.09 | .038 |
| Success at moderate task | 4.35 | 1, 201 | .038 | .021 | 0.136 | 0.138 | 0.99 | .326 |
| SES * Success | 0.54 | 1, 201 | .464 | .003 | 0.074 | 0.270 | 0.27 | .785 |
| Past experiences with Sudoku | 0.08 | 1, 201 | .785 | .000 | -0.109 | 0.148 | -0.73 | .464 |
| ABILITY | | | | | | | | |
| (Intercept) | | | | | 5.193 | 0.137 | 37.77 | < .001 |
| Childhood SES | 0.01 | 1, 201 | .965 | .000 | -0.006 | 0.133 | -0.04 | 0.965 |
| Success at moderate task | 14.29 | 1, 201 | < .001 | .066 | 1.068 | 0.282 | 3.78 | < .001 |
| SES * Success | 6.99 | 1, 201 | .009 | .034 | 0.686 | 0.259 | 2.64 | 0.009 |
| Past experiences with Sudoku | 3.12 | 1, 201 | .079 | .015 | 0.252 | 0.143 | 1.76 | 0.079 |
| CHANCE/LUCK | | | | | | | | |
| (Intercept) | | | | | 3.315 | 0.177 | 18.76 | < .001 |
| Childhood SES | 0.68 | 1, 201 | .410 | .003 | 0.141 | 0.170 | 0.83 | 0.410 |
| Success at moderate task | 1.89 | 1, 201 | .171 | .009 | -0.499 | 0.363 | -1.37 | 0.171 |
| SES * Success | 6.47 | 1, 201 | .012 | .031 | -0.848 | 0.333 | -2.54 | 0.012 |
| Past experiences with Sudoku | 1.42 | 1, 201 | .236 | .007 | -0.218 | 0.183 | -1.19 | 0.236 |

Figure M3.5

The Effects of Childhood Socioeconomic Status on Attributing the Outcome to (a) Ability and (b) Chance among the Participants who Succeeded (n=141) and Failed (n=98) the Moderate Task.



The Mediating Role of Self-Efficacy Beliefs

Self-Efficacy as a Mediator of the Effect of Childhood Socioeconomic Status on the Appraisal

To answer this question, I conducted a mediation analysis. Prior to it, we tested the effect of socioeconomic status in childhood on self-efficacy and of self-efficacy on problem-focused coping potential to check whether all the conditions for the presence of mediation (Baron & Kenny, 1986) are satisfied. The results revealed significant positive effects of childhood status on self-efficacy and significant positive effects of self-efficacy on problem-focused coping potential, indicating that all conditions for mediation are satisfied. As childhood status was also a significant predictor of past experiences of Sudoku, I included past experiences as a parallel mediator.

The results revealed that the addition of the two mediators made the direct effect of childhood status on problem-focused coping potential at a moderate task nonsignificant. That might mean that together, self-efficacy beliefs and past experiences with Sudoku, have a potential to fully explain the relationship between childhood status and appraisal. However, this does not hold true for the effects of childhood status on appraisal at difficult task: With the inclusion of past experiences, the direct effect remains significant. The results are summarized in Table M3.6 and Figure M3.6.

Self-Efficacy as a Mediator of the Effect of Childhood Socioeconomic Status on the Attribution of Success and Failure

The previous analyses allowed to establish that socioeconomic status in childhood was a significant predictor of (1) attributing success to ability among those who solved the moderate Sudoku puzzle successfully, and (2) attributing failure to luck among those who did not manage to solve the moderate puzzle. To follow up on these findings and to reveal the mechanism underlying the effects of childhood socioeconomic status on attribution of success and failure, I conducted two sets of mediation analysis. In both analyses, I tested the role of self-efficacy beliefs as a mediator. Indirect effects were nonsignificant (marginally significant for the attribution of success to ability). However, in both cases, indirect effects accounted for a relatively large portion of the relationship between socioeconomic status in childhood and attribution: 32% in the effects of childhood socioeconomic status on the attribution of success

to ability, and 39% in the effects of childhood socioeconomic status on the attribution of failure to chance. The results of the analysis are presented in Tables M3.7 and M3.8, and in Figures M3.7 and M3.8.

Table M3.6

The Effect of Childhood Socioeconomic Status on Problem-Focused Coping Potential Mediated by Self-Efficacy Beliefs and Past Experiences with Sudoku. Total, Direct, and Indirect Effects

| Type | Effect | Estimate | SE | z | p |
|-----------------------|---|----------|-------|------|-------|
| MODERATE TASK | | | | | |
| Indirect | Childhood SES → Self-Efficacy → PFCP | 0.199 | 0.053 | 3.73 | <.001 |
| | Childhood SES → Past experiences → PFCP | 0.090 | 0.035 | 2.54 | .011 |
| Component | Childhood SES → Self-Efficacy | 0.414 | 0.087 | 4.78 | <.001 |
| | Self-Efficacy → PFCP | 0.480 | 0.080 | 5.97 | <.001 |
| | Childhood SES → Past experiences | 0.210 | 0.059 | 3.58 | <.001 |
| | Past experiences → PFCP | 0.429 | 0.119 | 3.62 | <.001 |
| Direct | Childhood SES → PFCP | 0.162 | 0.114 | 1.42 | .156 |
| Total | Childhood SES → PFCP | 0.451 | 0.118 | 3.81 | <.001 |
| DIFFICULT TASK | | | | | |
| Indirect | Childhood SES → Self-Efficacy → PFCP | 0.210 | 0.060 | 3.49 | <.001 |
| | Childhood SES → Past experiences → PFCP | 0.036 | 0.032 | 1.10 | .271 |
| Component | Childhood SES → Self-Efficacy | 0.414 | 0.087 | 4.78 | <.001 |
| | Self-Efficacy → PFCP | 0.507 | 0.099 | 5.11 | <.001 |
| | Childhood SES → Past experiences | 0.210 | 0.059 | 3.58 | <.001 |
| | Past experiences → PFCP | 0.169 | 0.146 | 1.16 | .248 |
| Direct | Childhood SES → PFCP | 0.370 | 0.141 | 2.63 | .009 |
| Total | Childhood SES → PFCP | 0.615 | 0.139 | 4.42 | <.001 |

Figure M3.6

Self-efficacy and Experiences with Sudoku as Mediators of the Effect of Socioeconomic Status in Childhood on the Appraisal of Problem-Focused Coping Potential

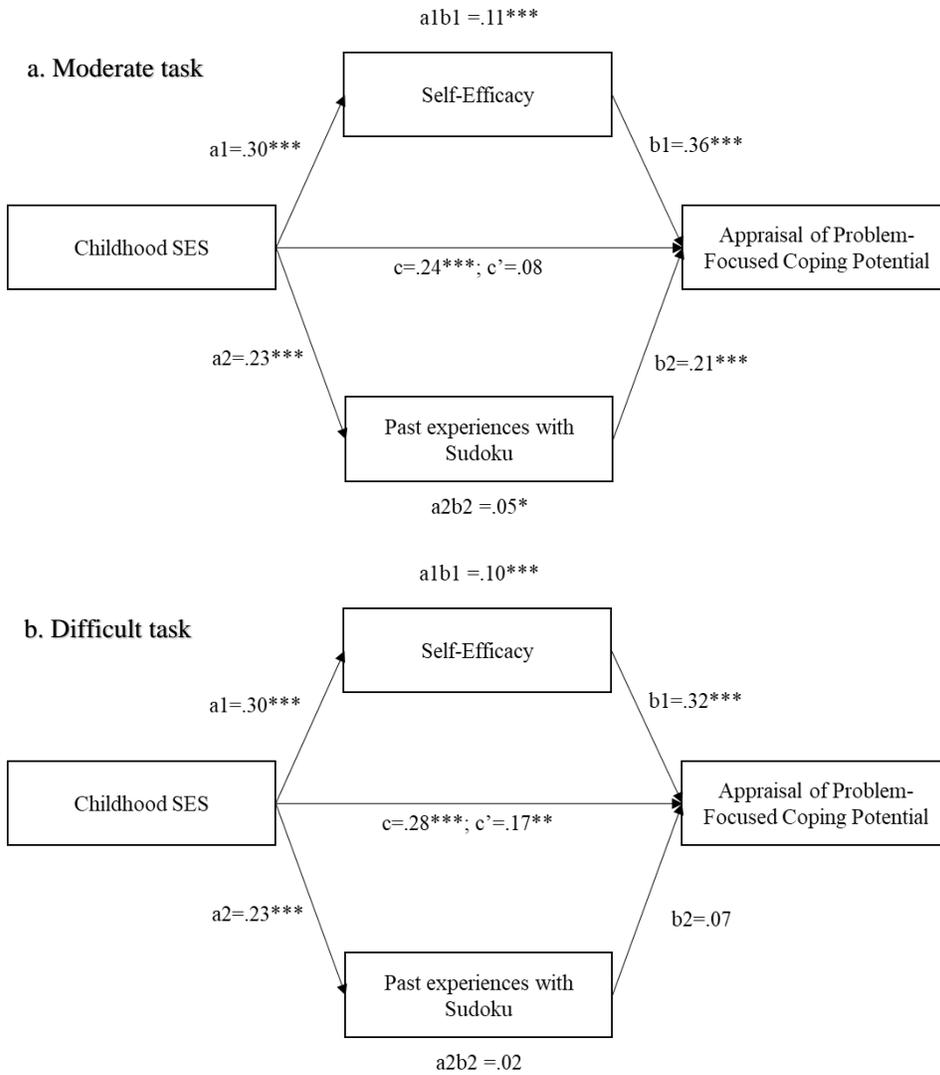


Table M3.7

The Effect of Childhood Socioeconomic Status on Attributing Success to Ability Mediated by Self-Efficacy Beliefs. Total, Direct, and Indirect Effects. N = 141.

| Type | Effect | Estimate | SE | z | p |
|-----------|---|----------|-------|------|-------|
| Indirect | Childhood SES → Self-Efficacy → Attribution | 0.101 | 0.059 | 1.71 | 0.088 |
| Component | Childhood SES → Self-Efficacy | 0.200 | 0.110 | 1.82 | 0.069 |
| | Self-Efficacy → Attribution | 0.504 | 0.103 | 4.88 | <.001 |
| Direct | Childhood SES → Attribution | 0.264 | 0.133 | 1.98 | 0.047 |
| Total | Childhood SES → Attribution | 0.364 | 0.143 | 2.55 | 0.011 |

Table M3.8

The Effect of Childhood Socioeconomic Status on Attributing Failure to Chance Mediated by Self-Efficacy Beliefs. Total, Direct, and Indirect Effects. N = 98.

| Type | Effect | Estimate | SE | z | p |
|-----------|---|----------|-------|------|-------|
| Indirect | Childhood SES → Self-Efficacy → Attribution | 0.174 | 0.122 | 1.42 | 0.154 |
| Component | Childhood SES → Self-Efficacy | 0.663 | 0.167 | 3.96 | <.001 |
| | Self-Efficacy → Attribution | 0.262 | 0.171 | 1.53 | 0.127 |
| Direct | Childhood SES → Attribution | 0.293 | 0.261 | 1.12 | 0.262 |
| Total | Childhood SES → Attribution | 0.466 | 0.241 | 1.94 | 0.049 |

Figure M3.7

Self-efficacy as a Mediator of the Effect of Socioeconomic Status in Childhood on the Attribution of Success to Ability. N = 141.

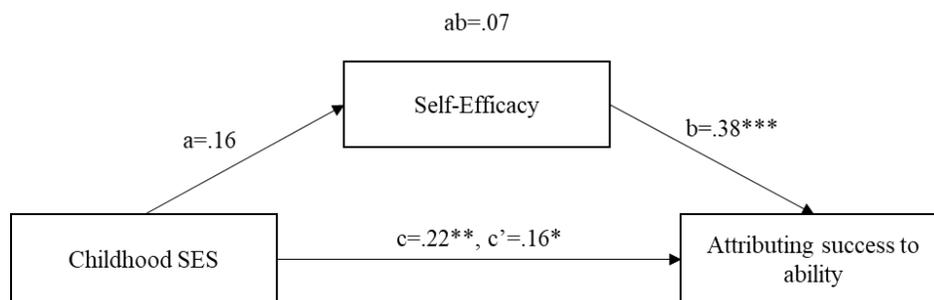
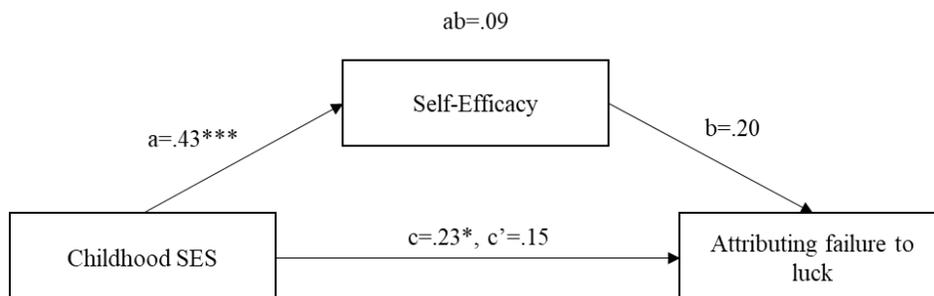


Figure M3.8

Self-efficacy as a Mediator of the Effect of Socioeconomic Status in Childhood on the Attribution of Failure to Chance. N = 98.



Discussion

I observed that the research on socioeconomic gap in achievement has rarely focused on social-cognitive processes as possible mechanisms that could explain the disparity in attainment between people coming from lower and higher socioeconomic backgrounds. In this manuscript, I focused on the role of early-life socioeconomic environment in the process of appraisal of problem-focused coping potential – a situational judgement of capability to be successful at a task at hand – and attribution of success and failure. I suggested that childhood experiences of disadvantage shape self-efficacy beliefs that can bias the process of appraisal and attribution. I tested this proposition in an online quasi-experimental study, in which 250 participants with different socioeconomic backgrounds solved cognitive tasks with different levels of difficulty and answered questions regarding the reasons that determined their outcome and their future probability to solve a similar task. Based on the findings, I hoped to develop a more refined understanding of the processes underlying the effects of early-life economic disadvantage on achievement in later life.

The findings of the study largely confirmed my predictions regarding the effects of childhood status on the appraisal of problem-focused coping potential. I hypothesised and found that socioeconomic status in childhood is positively associated with the appraisal of problem-focused coping potential, and that self-efficacy mediates this relationship. These findings are in line with those from the research that has previously linked socioeconomic background with the development of maladaptive competence beliefs (Billings, 1974; Cidade et al., 2016; Greene & Murdock, 2013). I also hypothesised that the effect of socioeconomic

status in childhood will only be significant in an ambiguous condition, i.e., when the participants solve moderate task, and nonsignificant in two unambiguous conditions, i.e., when they solve easy and difficult tasks. In line with my expectations, the effect of socioeconomic status on the appraisal was nonsignificant when the participants solved an easy task. Contrary to my expectations, socioeconomic status in childhood was a significant predictor of the appraisal at the very difficult task. It might be that the parameters of the difficult task (time available for its solution) were not as unambiguous as I initially planned and thus allowed for the participants' pre-existing beliefs to guide their judgement. In particular, while the appraisals of people with lower socioeconomic backgrounds were low, the participants with higher socioeconomic status in childhood seemed to be sceptical that the difficult task was beyond their ability, which was expressed in their higher appraisals. This might mean that individuals who grow up in more advantaged environments are more prone to the optimism (Bracha & Brown, 2012; Sharot, 2011) and overconfidence (Fellner & Krügel, 2012) biases.

Although I did not make specific predictions regarding the differences in the presence and strength of the effect of childhood status among those who failed and succeeded at the moderate task, I thought it would be important to ask this question. A large body of literature in psychology and behavioural economics suggests that people are more affected by negative events than by positive events (Gaechter et al., 2007; Ito et al., 1998; Kahneman, 2011; Rozin & Royzman, 2001), however, these effects vary as a function of individual differences (Ashare et al., 2013; Ito & Cacioppo, 2005). My analyses showed that socioeconomic status did interact with the outcome, and that its effect was only significant among those who failed the moderate task, but not among those who succeeded at it. Among those who failed the task, childhood status positively predicted the appraisal, meaning that people with higher socioeconomic status seem to be less susceptible to the effects of failure. At the same time, the nonsignificance of the effect among those who succeeded likely indicates that people who grew up in families with low socioeconomic status, despite having lower self-efficacy beliefs, readily integrate the information about their success and use it in their appraisals.

Speaking about the effects of socioeconomic status in childhood on attribution, the results are less conclusive, i.e., some of the effects found were marginally significant. However, overall, the findings point in the same direction. The participants who grew up in more disadvantaged circumstances were more consistent in their attributions, regardless of whether

they failed or succeeded. People coming from higher socioeconomic backgrounds, on the contrary, tended to make different attributions depending on whether they succeeded or failed. Among those who succeeded, individuals with higher socioeconomic status in childhood were more likely to attribute their success to ability. Among those who failed, higher status participants were more likely to explain their failure with bad luck. Similar pattern of results can be observed when testing the relationship between socioeconomic status and attribution across tasks with different difficulty. For instance, although the results were nonsignificant, people with higher childhood status were less likely to attribute their outcome at the difficult task (failure) to ability and effort, and more likely to explain it with luck. These findings suggest that people who grew up in more advantaged conditions are more susceptible to self-serving bias.

To sum up, it seems that people growing up in families with higher socioeconomic status develop a self-protection mechanism that might be contributing to their higher levels of achievement. This self-protection mechanism involves the development of a strong sense of self-efficacy and manifests as an optimism and overconfidence biases in the process of appraisal of problem-focused coping potential and as self-serving bias in the process of attribution of success or failure. Together, these biases likely make people coming from more privileged backgrounds more willing to take on challenges and less affected by the negative effects of failure. Interestingly, although one could expect that people coming from less advantaged backgrounds would be prone to a reverse bias, that was not the case. In fact, the findings suggest that people with lower childhood status are not susceptible to bias: they made more consistent attributions and, those who succeeded, did not reject their success readily integrating this information in their appraisals of coping potential. The latter is particularly important and reassuring as it means that people from less privileged backgrounds are likely to be receptive of the positive feedback on their capabilities. Thus, making sure that they receive such feedback could help increase their self-efficacy and improve achievement outcomes.

The research presented in this manuscript is not without limitations. The first one is that the motivational relevance – one of the important dimensions of appraisal – was not assessed in this study. As a result, it is impossible to conclude whether the fact that childhood socioeconomic status did not have a significant effect on emotional states can be explained by

low motivational relevance of the situation. Thus, future studies should include the assessment of motivational relevance. In settings where motivational relevance is likely to be low for everyone (e.g., an online experiment, where failing a task does not involve any negative consequences), it could be experimentally induced (for an example, see Smith & Kirby, 2009b).

The second limitation is that the research question about the effects of childhood poverty on appraisal and behaviour in adult age is longitudinal in nature, yet it is addressed with a cross-sectional research design. That does not always allow to reliably control for other potential explanations of the tested effect. There is a general scepticism regarding data collected using retrospective self-reports as it is believed to be a non-accurate representation of the objective conditions. However, as reported in the study comparing subjective and objective data of respondents' childhood experiences on a cross-country longitudinal data (Mazzonna & Havari, 2015), self-reported estimates of childhood experiences quite accurately represent objective experiences and conditions. Future research should, however, attempt to address the question of childhood SES effects using longitudinal designs.

The third limitation is that the sample size of the study was not that large. Although the initial power analysis indicated that 250 people would be enough to detect a medium sized main effect of childhood socioeconomic status, this number might have been suboptimal for the test of the interaction effect of childhood status and the outcome at the moderate task. For instance, the subsample of those who failed the Sudoku consisted of only 98 participants. Small sample sizes are associated with such problems as lower statistical power and less precise estimates. Therefore, it is crucially important to attempt to replicate these results using larger sample size in the future.

Finally, this study is limited to one geographical and social context and thus any generalisations to other contexts should be made with caution. Individual experiences of economic disadvantage and social status are not universal across different contexts. Growing up poor in sub-Saharan Africa is not the same as growing up poor in the suburbs of London, simply because economic disadvantage has a very different meaning in these two contexts. In the present study, I focused on a very particular context and group of people who were born and raised at a particular period of time. The experiences of economic disadvantage among

these people are not independent of other factors such as the level of economic inequality in the country, the development of welfare state, and the stereotypes and attributions for poverty.

In addition to addressing the limitations outlined above, future research should aim to test whether the effects of socioeconomic status extend to other domains. It is important to understand how uniform the effects of childhood status on appraisal and attribution are across different tasks and domains of activity. Last but not least, one might want to explore the potential negative effects of biases associated with higher childhood socioeconomic status on behaviour and wellbeing of people susceptible to these biases. One potential issue is rigidity and unresponsiveness to critique and negative feedback. It might be particularly dangerous in situations when there is a mismatch between actual capabilities and available resources and perceived ability to be successful at an endeavour. In such cases, one might miss the cues indicating problems and as a result fail to adjust the behaviour accordingly.

General Discussion

Overview and Summary of the Findings

In an attempt to extend our understanding of the mechanism underlying the relationship between economic disadvantage and educational attainment, this dissertation took a social-cognitive approach to the analysis of the experiences of economic disadvantage. In doing so, I attempted to address the questions that remained unexamined by the previous research on the topic carried out within the three broad perspectives outlined in the thesis. These are sociological, which is mainly represented by status attainment models, neurocognitive, which centres around the development of executive function, and social-psychological, which links socioeconomic disadvantage with low control and mastery beliefs. Specifically, existing research often viewed individuals as passive recipients of the outside influences and, in a way, deprived them of agency and denied their active role in learning from experiences and internalizing these experiences in stable mental representations. The research that did acknowledge that economic disadvantage is associated with the development of such mental representations (social-psychological perspective) was quite vague when it comes to the actualization of these representations in specific achievement-related situations. In particular, it was silent with regard to how stable mental representations interact with the situational parameters. Finally, studies often failed to differentiate between the effects of different socioeconomic indicators. I aimed to underscore the importance of individuals' subjective experiences and their mental representations to the process of judgement that precedes any achievement-oriented behaviour.

Following the social-psychological perspective to the analysis and explanation of the socioeconomic gap in achievement, I proposed that socioeconomic background influences the development of stable beliefs about one's ability to be in control of their lives and cope with challenges – self-efficacy beliefs. The lack of mastery experiences that results from the deficit in executive function (as suggested by research within neurocognitive perspective), parents' expectations regarding their children's future life chances (as observed by status attainment theorists), and children's observations of peers and experiences at school (interacting with teachers) likely predispose children from lower status families to develop lower self-efficacy beliefs. As a function of self-efficacy beliefs, socioeconomic status in childhood biases the process of appraisal of problem-solving coping potential – a situational judgement of capability

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– and, via appraisal, guide cognition, emotion, and behaviour. Furthermore, socioeconomic status in childhood and associated self-efficacy beliefs inform the process of attribution of the outcome.

This process is described and illustrated in three manuscripts. The first manuscript presents a study that explores the roles of self-efficacy antecedents in the relationship between socioeconomic background and educational expectations of 13-year-old secondary school students. Its findings suggest that self-efficacy antecedents fully explain the effects of family income, social class, and education of primary caregiver on educational expectations. The second manuscript digs deeper into the role of pre-existing self-efficacy beliefs in the process of appraisal of problem-focused coping potential and presents a theoretical framework specifying the mechanism underlying this effect and the conditions that moderate the predictive power of self-efficacy. The third manuscript, building on the proposed theoretical framework, tests the effects of childhood socioeconomic status on the appraisal of problem-focused coping potential at solving a cognitive task and the attribution of success or failure at this task. It also assessed the mediating role of self-efficacy in the relationship between socioeconomic status in childhood and the appraisal of problem-focused coping potential.

The first study demonstrates that the relationship between family background and educational expectations can, to a considerable extent, be explained by three groups of self-efficacy antecedents. Self-efficacy antecedents were represented by students' performance in standardized tests, the share of students with literacy and numeracy at the school the student attended, feedback from the teacher and the expectations of the primary caregiver (usually mother) regarding their children's future attainment. In fact, self-efficacy antecedents fully explained the effects of income, social class, and primary caregiver's education. This suggests that economic disadvantage in childhood leads to the development of low self-efficacy beliefs that further prevent one from setting ambitious goals and having higher educational expectations.

The second study (reported in Manuscript 3) confirmed that early-life economic disadvantage and generalised self-efficacy are indeed related. Furthermore, it allowed for a more refined understanding of the process through which internalised experiences of economic disadvantage actualize in specific situations when individuals are faced with challenges. The results of this study suggest that those who grow up in more well-off families develop a range

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of psychological self-protection mechanisms that enable them to better cope with challenges and overcome difficulties. Self-serving bias in attribution seems to be one such self-protection mechanism. When people coming from higher socioeconomic backgrounds fail the task, they tend to attribute their failure to external reasons (bad luck). When they succeed, however, they are likely to explain success with their ability. This leads them to appraise their problem-focused coping potential to solve a cognitive task as higher, even when the task is very difficult and when they have just failed an almost identical task. Although self-serving bias is thought to be quite universal (Mezulis et al., 2004), individuals with lower socioeconomic status in childhood seem to be less susceptible to it. They seem to interpret situational information about their capability more accurately. This cognitive accuracy means that, on average, they appraise their coping potential as lower. This might, in turn, hinder their achievement by making it difficult for them to recover from initial failure and not try again. On a positive note, however, people with lower childhood socioeconomic status are susceptible to the effects of positive mastery experiences and readily integrate them in the process of appraisal of problem-solving coping potential. This means that the interventions targeting self-efficacy and appraisals of people with lower socioeconomic backgrounds would likely be successful.

Together, the findings from the studies conducted as part of this dissertation project extend the existing knowledge of the role of early-life economic disadvantage in the formation of educational expectations and in educational achievement and allow for a better understanding of the socioeconomic gap in educational achievement. It is my belief that introducing self-efficacy, appraisal of problem-focused coping potential and attribution of success and failure into the analysis and discussion of the effects of socioeconomic disadvantage on achievement is a useful approach that helps to deepen our understanding of the gap in educational expectations and achievement among students' coming from lower-income and higher-income families. It allows for a more refined understanding of this gap by further delineating social-psychological mechanisms that had been roughly sketched by status attainment theorists (Blau & Duncan, 1967; Haller & Portes, 1973; Sewell & Shah, 1968) and differentiating between the effects of various socioeconomic indicators of family background. In addition, it extends the findings from the neurocognitive perspective (Farah et al., 2006; Hackman et al., 2010; Hair et al., 2015; Noble et al., 2005; Rosen et al., 2020) by explaining how negative mastery experiences associated with reduced executive function

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crystalise into stable mental representations of ability that can systematically bias judgement, decision-making and behaviour. Finally, it gives more depth to the social-psychological approach (Greene & Murdock, 2013; Kane, 1987; Lever et al., 2005; Lewis, 1966; Rabow et al., 1983) explaining how individual differences associated with socioeconomic conditions actualize in contextualised judgements.

On a practical level, the insights generated as part of this project suggest that our efforts should be directed at designing policy solutions and interventions that would target self-efficacy beliefs in children coming from lower socioeconomic backgrounds. By attempting to provide children with more positive mastery experiences, surround them by encouraging examples and make them believe that they can attain if they put effort and stay persistent, we are likely to help them develop those self-protection mechanisms that children coming from more well-off families are better equipped with.

Self-efficacy and Appraisal as a Valuable Framework to Explain the Socioeconomic Gap in Educational Expectations: Contribution to Status Attainment Theory

The research described and discussed within this dissertation contributes to status attainment theory by (1) further differentiating between different indicators of family background, (2) extending research on status attainment to a different social and cultural context, (3) providing a framework that explains social-psychological mechanisms at play in the process of status attainment. Self-efficacy beliefs and associated appraisals of problem-focused coping potential serve as intermediaries in the relationship between family social background, parental encouragement, and children's ability on the one hand and educational expectations on the other.

Introducing self-efficacy as a framework allows for a systematisation of the existing findings and, importantly, for asking new questions and formulating new predictions with regard to the status attainment processes. Specifically, the existing classification of self-efficacy antecedents allows one to group all predictors of educational expectations according to this classification and to explain why, for instance, such a factor as participating in extracurricular activities, which might seem unrelated to educational expectations at first glance, plays a role in the formation of educational expectations. Following the logic of self-efficacy theory, the answer to this question would be as follows. First, extracurricular activities

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provide one with mastery experiences. Second, they allow for an environment where one witnesses how others acquire a skill and succeed. Finally, extracurricular activities often imply encouragement from others. Together, these factors contribute to the development of positive self-efficacy beliefs, which, in turn lead to the development of more positive educational expectations.

Contribution to Theory and Research on Self-Efficacy

The research presented in this dissertation contributes to the theory and research on self-efficacy in the following ways. First, I discussed the duality in conceptual understanding of what self-efficacy is as a phenomenon since researchers (often interchangeably) refer to it as either a belief or a judgement. Second, the experimental study I conducted demonstrated the value of operationalizing self-efficacy as a general belief in predicting a specific contextualised judgement – appraisal of problem-focused coping potential.

I make an important conceptual point, which, in my opinion, is not clearly pronounced in the existing literature. Namely, this point refers to the lack of clear conceptual differentiation between self-efficacy beliefs that represent a stable individual difference and self-efficacy judgements that refer to context-specific assessments of capability. This differentiation is important as it allows for a more precise understanding of self-efficacy as a phenomenon and for more accurate predictions regarding the effects of self-efficacy on behaviour. In Manuscript 2, I make a theoretical distinction between self-efficacy beliefs and self-efficacy judgements and discuss the function and properties of each phenomena.

The second study (Manuscript 3) contributes to the research on generalised self-efficacy beliefs. First, the study extends our understanding of factors that are important to the development of generalised self-efficacy. The results of the study revealed that socioeconomic status in childhood is one such factor. Second, despite some self-efficacy theorists questioning the value of conceptualizing and operationalizing self-efficacy as a general phenomenon for predicting individuals' contextualised reactions to the situation and behaviours, the experimental study presented in this dissertation has proved the critics wrong. Specifically, the results of this study have shown that generalised self-efficacy beliefs predict the appraisal of problem-focused coping potential – a contextualised judgement of capability that is always

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specific to the situation and that underlies individuals' emotional and behavioural reactions to that situation.

Contribution to Appraisal Theory of Emotion

One of the central premises of appraisal theory is that appraisals make different people react to the same situation differently and that the same person's reactions to different situations are consistent. Literature is, however, rather scarce when it comes to individual differences in appraisals. In this dissertation, I proposed that early-life experiences of economic disadvantage and generalised self-efficacy beliefs are individual differences that play important roles in the appraisal of problem-focused coping potential and that they are, thus, responsible for the inter-individual variability and intra-individual stability in appraisal over time. The empirical test of this proposition (Study 2, Manuscript 3) supports it. In addition, the second study allowed for a specification of conditions that moderate the importance of childhood socioeconomic status in the appraisal of problem-focused coping potential, providing a more in-depth and refined understanding of the processes underlying the appraisal.

Specifically, it appears that the effects of childhood socioeconomic status are non-uniform across tasks with different difficulty levels and among those who fail and succeed. Having taken a closer look into those interaction effects, I concluded that the effects of childhood status seem to only be significant when individuals are faced with a challenging task. For a task that is not challenging, their background and past experiences do not make any difference. Furthermore, the effects of childhood status seem to matter only among those who fail the task. Among these individuals, low socioeconomic status in childhood contributes to lower appraisals of problem-focused coping potential, and high socioeconomic status in childhood – to higher appraisals. Together, these interaction effects indicate that the nature of processes underlying appraisal outcomes is not as straightforward and can indeed be very complex. These findings go in line with one of the main assumptions of appraisal theory (Frijda, 1986, 2007; Lazarus, 1991; Roseman, 1984; Scherer, 1984, 2009; Smith & Ellsworth, 1985), and with the classic social-psychological approach to understanding judgement and behaviour, namely, that judgements and behaviours result from an interaction between individual differences and situational influences. My findings provide one specific example of such an interaction.

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Additionally, the findings of the second study presented in Manuscript 3 allow for the formulation of new predictions regarding other individual differences in the appraisal of problem-focused coping potential and associated emotional reactions. When a child experiences economic disadvantage in their early life, these experiences might contribute to the development of lower self-efficacy and has a consequent impact on their appraisal of problem-focused coping potential. This in turn, allows us to make predictions about other factors impacting appraisals. Specifically, growing up in any environment that is restrictive of one's agency and that is not conducive to having positive mastery experiences would likely result in a tendency to make lower appraisals of problem-focused coping potential. One example of such environments and experiences could be, for instance, coming from a family with immigrant background and attending school where the language of instruction is not one's native language. Such background would likely predispose one to have fewer mastery experiences and, as a consequence, develop lower self-efficacy beliefs and a tendency to appraisal their coping potential as lower. Another example could be having a learning difficulty – that would also be a likely challenge that would hinder the development of positive self-efficacy and problem-focused coping potential.

Future Directions

Basic Research

The Effects of Childhood Socioeconomic Status on Decision-Making and Behaviour Associated with Academic Attainment. In the present dissertation, the idea that lower childhood status is linked with lower self-efficacy beliefs and lower appraisals of problem-focused coping potential was supported. Lower appraisal of problem-focused coping potential among those coming from lower socioeconomic backgrounds is likely to explain why they underachieve. To extend the present findings, future research should focus on the effects of lower socioeconomic status in childhood on decisions and behaviours that are central to achievement, and on the role of the appraisal of problem-focused coping potential in these effects. Such decisions and behaviours should include goal setting and persistence at pursuing goals. Thus, questions that one might ask would be as follows: “Do people with lower socioeconomic backgrounds set less ambitious goals as a function of their lower self-efficacy beliefs and lower appraisal of problem-focused coping potential?” and “Are people with lower

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socioeconomic backgrounds less persistent and give up more easily as a result of them having lower self-efficacy beliefs and making lower appraisals of problem-focused coping potential?”. Given that the appraisal of problem-focused coping potential has been linked with challenge and persistence (Smith & Kirby, 2009b), I am confident that it has the potential to explain the negative effects of childhood socioeconomic status on achievement-oriented decisions and behaviours.

Potential Moderators that Could Influence the Effect of Socioeconomic Status in Childhood on Self-Efficacy and Appraisal of Problem-Focused Coping Potential. Despite the results of the research presented in this dissertation support the idea that growing up in less advantaged circumstances negatively impacts the development of self-efficacy and appraisal of problem-focused coping potential, one should be aware that a number of conditions could make this effect stronger or weaker. Research on resilience provides multiple examples of cases of individuals who had a bad start in life overcoming the difficulties and striving (e.g., Garmezy, 1993; Hostinar & Miller, 2019; Sattler & Gershoff, 2019). Thus, future research should explore the factors that help one develop resilience and thus become less susceptible to the negative effects of childhood socioeconomic status. Among such factors are likely the loving and supporting atmosphere within the family, social capital, and the existence of strong social support systems within the given society. The latter is particularly important because it can help explain why the effects of socioeconomic status are not uniform across different social and cultural contexts.

Universality of Childhood Socioeconomic Status Effects Across Different Social and Cultural Contexts. Individual experiences of economic disadvantage and social status are not independent of the social structure of the society people live in. Economic systems, the extent of a welfare state, country-level poverty, economic inequality, rate of social mobility, or general attitudes to and perceptions of working class and the poor might affect how economic disadvantage and belongingness to a certain social stratum are experienced at the individual level. Thus, any generalizations about the effects of socioeconomic conditions on psychological variables across contexts that differ on the aforementioned characteristics are a matter of empirical scrutiny. Recent research provides some evidence for non-universality of the effects of socioeconomic status on academic outcomes. Specifically, it has shown, for instance, that perceptions of social mobility among lower status students influence their

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academic motivation (Browman et al., 2019). Extending research on the effects of childhood socioeconomic status on self-efficacy and the appraisal of problem-focused coping potential to other contexts is a crucial step on a way to further deepen our understanding of the processes underlying the effects of socioeconomic background.

It might be that the negative effects on self-efficacy and the appraisal of problem-focused coping potential are not universal across contexts. The studies conducted as part of this dissertation research were carried out using the data coming from the Republic of Ireland and the United Kingdom. Particularly in the UK, the attributions of poverty people make are usually dispositional (i.e., blaming the poor for their misfortune) and attitudes towards people with lower socioeconomic backgrounds are rather negative (e.g., Jones, 2011). Thus, it is likely that those growing up in underprivileged environments internalise those attributions about themselves and, as a result, develop lower self-efficacy beliefs. It is also the case that both in the United Kingdom and in the Republic of Ireland, schools in less advantaged neighbourhoods are more likely to stream students according to their ability levels (Smyth, 2018), which puts students with lower socioeconomic backgrounds at a disadvantage and is not conducive to them having positive mastery experiences and developing a strong sense of efficacy. These two contextual characteristics clearly matter to the development of one's self-efficacy beliefs and make it more likely for those with lower status living in these two contexts develop lower self-efficacy beliefs and, as a result, appraise their problem-focused coping potential as lower. In other contexts, however, this might not be the case, and future research should address that. Furthermore, one of the findings that sheds light onto why people who grew up in more well-off families usually appraise the problem-focused coping potential as higher related to the presence of self-serving bias among those coming from higher socioeconomic backgrounds. Past research has demonstrated that self-serving bias can be more or less pronounced depending on the participants' cultural background (e.g., Nurmi, 1992). Thus, it is important to account for the interaction between one's socioeconomic and cultural background in the attribution of success and failure in the future research.

The Content and Structure of Generalised Self-Efficacy Beliefs. Although the present research demonstrates the importance of generalised self-efficacy beliefs in predicting contextualised judgements of capability that likely serve as intermediaries between those beliefs and behaviour, questions remain regarding the context of generalised self-efficacy

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beliefs. In their attempts to clarify the content of generalised self-efficacy, some authors (e.g., Sherer et al., 1982) proposed that it represents a ratio of all individuals' successes and failures. This proposition, however, seems oversimplified as it implies that all experiences have the same subjective value and are equally well remembered, regardless of the period in which they took place and the conditions under which they occurred. Given that the human cognitive system is biased in how we perceive, interpret and recall self-relevant information (e.g., Markus & Wurf, 1987), a more plausible assumption would be that different experiences contribute to individuals' general sense of efficacy with different weight. The question of what defines this weight, however, has not been addressed in the general self-efficacy literature yet. It might be that this weight is defined by the centrality of the domain of functioning to one's identity. Successes and failures at activities in central domains are likely more impactful to one's general sense of efficacy. These are just some thoughts on what generalised self-efficacy might reflect. These thoughts require further formalization and a consequent empirical test. I believe that such a test would be an important development to extend our understanding of the content of self-efficacy beliefs.

Individual Differences in Appraisal. Manuscripts 2 and 3 outlined and tested the mechanism explaining how childhood socioeconomic status and self-efficacy as stable individual differences underlie the appraisal of problem-focused coping potential. Future research should extend those mechanisms to other appraisal dimensions and explore the roles of relevant individual differences in those dimensions. For instance, attributional style might be an individual difference to focus on when predicting appraisal of accountability. Research on hostile attributional bias suggests that early-life environment in which one grows up (e.g., family with an aggressive and abusive parent) is conducive to them developing a tendency to explain unfavourable situations and others' actions towards them in a particular way. Furthermore, speaking about such an appraisal dimension as goal conduciveness or motivational relevance, individual values might be an important predictor of those appraisals (Smith & Kirby, 2009b). Studying these individual differences would extend our knowledge and understanding of the processes underlying emotional experience.

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Applied Research

Targeting the Development of Self-Efficacy Beliefs. Self-efficacy beliefs developed in one domain of activity can generalise to other domains. One mechanism that might explain this spill-over effect is the commonality of skills required for a successful execution of different activities. Among the skills that are crucial to effective learning are an ability to set clear goals, plan with clarity and enact deliberate reflection. Furthermore, growth mindset (Dweck, 1996) is another important component of learning success. These skills and competencies can be potentially acquired in many different settings; their development does not need to be tied exclusively to the classroom. Once developed, they can be effectively used in a range of school-related activities.

Thus, policy solutions should target the development of these skills and competencies. This could be done within community settings, by providing communities with access to sports, for instance, and ensuring that this participation is conducive to the development of necessary skills and competencies. Access to, and participation in sports has been linked with positive outcomes by previous research. In particular, research has shown that sports participation helps develop self-efficacy (Moritz et al., 2000), better self-regulatory (Lakes & Hoyt, 2004) and leadership skills (Gould & Voelker, 2012; Wright & Côté, 2003).

In my opinion, two types of research activities should accompany the implementation of such interventions. The first type of research should focus on pre-testing these solutions in laboratory settings and natural environments. The questions asked by such research would relate to the factors that enhance the development of these skills and competencies. The second type of research activities should aim at the evaluation of the effectiveness of such solutions by means of field experiments.

I believe that policy and research activities targeting self-efficacy and more general self-regulatory skills and competencies would be a useful tool to help reduce socioeconomic inequality in educational achievement. The findings from the existing research that aimed to implement, and test similar interventions show promise. For instance, evaluations of interventions targeting growth mindset demonstrate that such interventions positively affect academic achievement of students as well as their educational expectations (Ganimian, 2020; Outes-Leon et al., 2020). Furthermore, overviews of the research on the role of extracurricular activities show that they have positive effects on a wide range of developmental outcomes –

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from school performance and attainment to leadership skills and general psychological adjustment (Farb & Matjasko, 2012).

Changing How We Think about Ability and Scores of Standardized Tests. The results of the first study revealed that students' scores on standardized tests played an important role in the educational expectations, as well as in the relationship between students' family background and educational expectations. This means that policy efforts should focus on (1) early-life cognitive development of students coming from disadvantaged backgrounds, (2) the way ability and scores on standardized tests are socially constructed and interpreted. A lot of resources were invested in the early-life development of children; however, those efforts have rarely turned out to be big successes. Disparity in cognitive development among children coming from poorer and more well-off families remains prominent to this day. It is understandable and perhaps predictable given that poverty and low socioeconomic status go hand-in-hand with a vast majority of factors that impact cognitive development, ranging from mother's nutrition during pregnancy (Brooks-Gunn & Duncan, 1997) to parents' vocabulary (Chazan-Cohen et al., 2009; Rohde & Thompson, 2007) and to the ability to provide a better standard of childcare by the richer parents. On practice, it would be difficult to effectively target all of them.

It might be that attempting to influence how people think about standardized testing, particularly what the score on a standardized test actually tells one about their knowledge and skills, policy would achieve better results. In principle, there are two ways one can interpret a score on a standardized test. It can either be seen as an expression of one's true ability and innate talent, or as an extent to which certain skills and school curriculum have been acquired. The first way of thinking about standardized testing is potentially more dangerous as it implies that the test captures something that cannot be changed, and fixed mindset is not conducive to positive learning outcomes. Given that students from disadvantaged backgrounds systematically score lower on such tests, this view would lead them develop a negative idea of their ability. Because ability is often viewed as something fixed (Dweck, 1996; Hwang et al., 2019), a low score on an ability test would serve as a discouragement to put in effort and be persistent. In other words, why even try if you are simply not good enough. By attempting to shift the meaning of the ability tests scores more in the direction of "skills and competencies assessment" and stressing the idea that these skills can be developed with effort and persistence,

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we would get a better chance at empowering students coming from lower socioeconomic backgrounds. This view of their scores would allow for the idea of growth and development and keep students more motivated.

As with the research that accompanies efforts directed at the development of self-efficacy beliefs, research activities focused on the role of standardized tests can be subdivided into two categories. First, the effectiveness of using standardized tests for students' outcomes should be evaluated by means of randomized controlled trials. Second, research should aim to pretest the solutions targeting students' and their parents' perceptions of standardized tests scores. Let me outline two hypothetical studies as an example.

Effectiveness of Standardized Tests. Standardized testing was introduced with the purpose of being better equipped to identify students who have learning difficulties. However, the research on the effectiveness of standardized testing at schools failed to demonstrate that this method of detecting students with difficulties is more useful than other methods. The value of standardized tests for students' outcomes is thus not well understood. In fact, concerns about the relevance of such testing, particularly in disadvantaged areas that typically score lower on standardized tests, have been consistently raised in countries where such testing takes place (Irish Examiner, 2019). Research should explicitly address the value of standardized testing at schools. This could be achieved by employing randomized controlled trials, where schools that are similar in as many parameters as possible (e.g., number of students, socioeconomic profile of students, demographic profile of teachers, etc.) would be randomly assigned to either treatment or control condition, i.e., one set of schools would carry out standardized testing as always, and others not. Assessing a range of students' skills and competencies, as well as their perceived competence beliefs, before and after the intervention takes place, would allow for a conclusion on the benefit (or harm) of standardized testing.

Perceptions of Tests Results. In some countries where standardized tests are a part of educational process (e.g., the Republic of Ireland), parents receive a letter with their child's results. The format of the letter is uniform for all schools – it informs the parent about their child's position on the curve, that is in comparison with all other students of the same age in the country. Although the letter does not explicitly state that the scores are indicators of innate ability, the emphasis on the comparison with others is not likely to help students' who are doing worse to form positive beliefs about their competence. As those who are doing worse

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often come from disadvantaged backgrounds, it only exacerbates their already existing disadvantage. I believe that the format of the letter can be changed so that the focus is drawn away from the comparison aspect, and so that an explicit “disclaimer” about the accuracy and limitations of such testing is included. In addition, the letter should be more developmental and focus on the potential for growth and improvement. One could test how different formats of such letter would impact individuals’ perceptions of standardized tests scores.

Concluding Remarks

This thesis presented an attempt to extend our understanding of the socioeconomic gap in achievement by proposing and testing a social-cognitive mechanism that could explain this gap. I conducted and reported on two empirical studies (presented in Manuscripts 1 and 3) and carried out a theoretical analysis of the two concepts central to the proposed mechanism – generalised self-efficacy and appraisal of problem-focused coping potential (outlined in Manuscript 2). In conclusion, I would like to make a few points, some of which are the key insights gleaned from the two empirical studies presented in this dissertation, and others are more general reflections.

Speaking about the effects of socioeconomic status, it is important to distinguish between different aspects of socioeconomic background. The analysis of the relationship between socioeconomic variables and educational expectations presented in this dissertation demonstrated that family income, social class and each caregiver’s education predict educational expectations independently. Moreover, each predictor acts in a unique way and exerts its influence through different social and psychological mechanisms. Thus, by reducing the complexity of socioeconomic background, we risk missing important mechanisms that would otherwise allow us to understand the phenomenon of interest better.

It seems that people who grow up in economically challenging environments are more predisposed to having difficulties recovering from failure as they lack self-protection mechanisms that their more well-off counterparts had a chance to develop. However, they seem to be highly responsive to success, which means that with enough positive mastery experiences in their lives, they would strive and possibly catch up with those who grew up in more advantaged circumstances. A greater effort should be made to understand how to provide them with these positive experiences.

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At the beginning of my doctoral research, I spent a great deal of time reading about self-efficacy and appraisal of coping potential and trying to understand whether and how they are different from each other. This made me realise how important it is for a researcher to take time and think about what the phenomena that we study are on the conceptual level – their properties and functions, how general or specific and how transient or stable they are – as this translates into how we operationalise them in the empirical research, how we interpret our results and what conclusions we make. Most of the problems with the replication crisis in social psychology are attributed to the lack of transparency in research practices, publication bias, small sample sizes and inappropriate analytical techniques, so a lot of effort is directed to the improvement of researchers' skills in these domains. While it is undoubtedly a positive development, we should neither underestimate nor stop speaking about the importance of theory, as the lack of clarity and consistency in theory is likely contributing to the crisis as well.

I have attempted to gear the research presented in this dissertation towards applying social-psychological theory to the analysis of a real-life problem and proposing some possible ideas of how it could be addressed in the future. However, I also realise that a lot more work (and more applied work) needs to be done in order to design actual solutions that would allow us to improve the lives and experiences of people affected by poverty. It is my hope that such research will keep being undertaken within social psychology and that it will be as prestigious to do as more basic research.

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APPENDIX

Table M1A1

Descriptives for Students' Expectations Regarding Future Educational Attainment (Second Survey Wave)

| | Total | By Income Groups | | |
|------------------------------|-------|------------------|------------|-------------|
| | | Lowest 20% | Middle 60% | Highest 20% |
| Child's expectations | | | | |
| <i>N</i> | 7327 | 1051 | 4005 | 1713 |
| Expecting to obtain a degree | 55.4% | 43.5% | 53.3% | 66.1% |

Note: Because of missing values on income, the sum of three income groups does not add to the number of cases in the column "Total".

Table M1A2

Descriptives for Family Socioeconomic Background (Second Survey Wave)

| | Total | By Income Groups | | |
|---|-------------|------------------|-------------|-------------|
| | | Lowest 20% | Middle 60% | Highest 20% |
| Yearly income, per family member | | | | |
| <i>N</i> | 6 946 | 1080 | 4115 | 1751 |
| <i>M(SD)</i> | 17524(9454) | 7324(1364) | 14925(3515) | 30324(8975) |
| Family social class | | | | |
| <i>N</i> | 7 101 | 893 | 3912 | 1743 |
| Professional, technical, managerial | 59.1% | 32.0% | 53.0% | 86.4% |
| Skilled working class | 32.0% | 48.0% | 38.0% | 11.4% |
| Semi- or unskilled working class | 8.9% | 20.0% | 9.0% | 2.2% |
| Primary caregiver's education | | | | |
| <i>N</i> | 7120 | 1080 | 4115 | 1751 |
| Primary or less | 3.3% | 7.3% | 2.6% | 0% |
| Junior Certificate | 45.8% | 62.8% | 48.8% | 24.7% |
| Leaving Certificate/Diploma | 24.8% | 19.3% | 26.2% | 24.4% |
| University degree | 26.1% | 10.6% | 20.5% | 50.8% |
| Secondary caregiver's education | | | | |
| <i>N</i> | 6543 | 825 | 3451 | 1562 |
| Primary or less | 4.3% | 10.2% | 4.2% | 0% |
| Junior Certificate | 51.1% | 68.4% | 56.8% | 28.4% |
| Leaving Certificate/Diploma | 17.1% | 12.7% | 28.3% | 16.1% |
| University degree | 27.6% | 8.7% | 10.7% | 55.5% |

Note: Because of missing values on income, the sum of three income groups does not add to the number of cases in the column "Total".

Table M1A3*Descriptives for Self-efficacy Antecedents (Second Survey Wave)*

| | Total | By Income Groups | | |
|--|------------|------------------|------------|-------------|
| | | Lowest 20% | Middle 60% | Highest 20% |
| Math performance at age 9 (% of current answers) | | | | |
| <i>N</i> | 7438 | 1069 | 4064 | 1735 |
| <i>M(SD)</i> | 56.4(21.0) | 50.7(21.4) | 56.4(20.7) | 62.8(19.6) |
| Reading performance at age 9 (% of correct answers) | | | | |
| <i>N</i> | 7437 | 1060 | 4028 | 1709 |
| <i>M(SD)</i> | 70.7(20.8) | 63.5(22.5) | 70.6(20.4) | 77.9(17.8) |
| Parental expectations | | | | |
| <i>N</i> | 7389 | 1056 | 4039 | 1733 |
| Expecting child to obtain a degree | 83.8% | 71.5% | 82.4% | 94.2% |
| Praise from the teacher | | | | |
| <i>N</i> | 7434 | 1063 | 4068 | 1735 |
| Often | 72.4% | 68.3% | 71.0% | 76.9% |
| A few times | 26.3% | 30.4% | 27.8% | 21.7% |
| Never | 1.3% | 1.3% | 1.2% | 1.4% |
| Numeracy problems at school | | | | |
| <i>N</i> | 7166 | 1032 | 3904 | 1683 |
| Less than 10% | 48.3% | 35.8% | 46.5% | 59.0% |
| 10-25% | 43.4% | 49.0% | 44.9% | 36.9% |
| 26-40% | 8.2% | 15.2% | 8.6% | 4.1% |
| Literacy problems at school | | | | |
| <i>N</i> | 7195 | 1037 | 3922 | 1685 |
| Less than 10% | 49.5% | 38.2% | 47.9% | 58.6% |
| 10-25% | 42.2% | 46.7% | 43.8% | 37.3% |
| 26-40% | 8.3% | 15.1% | 8.3% | 4.1% |

Note: Because of missing values on income, the sum of three income groups does not add to the number of cases in the column "Total".

Table M1A4*Descriptives for Control Variables: Social and Demographic Factors (Second Survey Wave)*

| | Total | By Income Groups | | |
|---|-------|------------------|------------|-------------|
| | | Lowest 20% | Middle 60% | Highest 20% |
| Child's gender | | | | |
| <i>N</i> | 7523 | 1039 | 3994 | 1687 |
| Female | 51.3% | 51.7% | 51.1% | 50.6% |
| Primary caregiver migrant status | | | | |
| <i>N</i> | 7524 | 1080 | 4112 | 1749 |
| Born in Ireland | 83.8% | 79.9% | 87.1% | 86.0% |
| Secondary caregiver migrant status | | | | |
| <i>N</i> | 6751 | 824 | 3449 | 1559 |
| Born in Ireland | 84.6% | 83.7% | 85.3% | 86.3% |
| Child's immigration status | | | | |
| <i>N</i> | 7524 | 1080 | 4111 | 1749 |
| Born in Ireland | 88.9% | 89.3% | 89.6% | 88.8% |

Note: Because of missing values on income, the sum of three income groups does not add to the number of cases in the column "Total".

Table M1A5*Descriptives for Control Variables: Developmental Conditions That Might Impact Learning (Second Survey Wave)*

| | Total | By Income Groups | | |
|---|-------|------------------|------------|-------------|
| | | Lowest 20% | Middle 60% | Highest 20% |
| Learning disability | | | | |
| <i>N</i> | 7511 | 1080 | 4115 | 1751 |
| Share | 6.8% | 10% | 7.8% | 6.5% |
| Autism spectrum disorder | | | | |
| <i>N</i> | 7511 | 1080 | 4115 | 1751 |
| Share | 0.9% | 1.2% | 0.7% | 1.0% |
| Emotional and behavioural disorder | | | | |
| <i>N</i> | 7511 | 1080 | 4115 | 1751 |
| Share | 1.1% | 1.9% | 1.5% | 0.7% |
| Speech or language difficulty | | | | |
| <i>N</i> | 7511 | 1080 | 4115 | 1751 |
| Share | 1.4% | 2.4% | 1.6% | 1.4% |
| Slow progress | | | | |
| <i>N</i> | 7511 | 1080 | 4115 | 1751 |
| Share | 1.0% | 2.1% | 1.3% | 0% |

Note: Because of missing values on income, the sum of three income groups does not add to the number of cases in the column "Total".

Table M1A6

Children's Educational Expectations Regressed on Family Socioeconomic Background (Odds Ratios and 95% Confidence Intervals). Each Predictor is Entered Separately. Calculations Are Done on the Sample from the Second Wave of the Survey

| | Children's Educational Expectations |
|--|--|
| Income | Model 1 |
| Lowest 20% | 0.733*** (0.625-0.860) |
| Highest 20% | 1.615*** (1.419-1.838) |
| (Ref.: Middle 60%) | |
| Social class | Model 2 |
| Semi- or unskilled working class | 0.458*** (0.375-0.559) |
| Skilled working class | 0.604*** (0.537-0.678) |
| (Ref.: Highly skilled professionals) | |
| Primary caregiver's education | Model 3 |
| Primary or less | 0.268*** (0.186-0.387) |
| Junior Certificate | 0.460*** (0.404-0.523) |
| Leaving Certificate/Diploma | 0.659*** (0.569-0.764) |
| (Ref.: University Degree) | |
| Secondary caregiver's education | Model 4 |
| Primary or less | 0.228*** (0.170-0.306) |
| Junior Certificate | 0.441*** (0.388-0.501) |
| Leaving Certificate/Diploma | 0.660*** (0.560-0.778) |
| (Ref.: University Degree) | |

Note. The table presents the results of four different models, with each model estimating the effect of one predictor.

Model 1 (control variables + income): $\chi^2(11) = 203, p < .001$.

Model 2 (control variables + social class): $\chi^2(11) = 231, p < .001$.

Model 3 (control variables + primary caregiver's education): $\chi^2(12) = 294, p < .001$.

Model 4 (control variables + secondary caregiver's education): $\chi^2(12) = 341, p < .001$.

*** $p < .001$, ** $p < .01$, * $p < .05$.

Table M3A1*Subjective Feelings and Appraisal of Problem-Focused Coping Potential at Solving a Moderate Task: Correlation Matrix, Means and Standard Deviations*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Mean (SD) |
|---------------|------------------|-------------------|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------|
| 1.Challenge | — — | | | | | | | | | 5.62(1.80) |
| 2.Nervousness | 0.322 *** 239 | — — | | | | | | | | 4.09(2.33) |
| 3.Hope | 0.229 *** 239 | 0.071 239 | — — | | | | | | | 5.07(1.86) |
| 4.Confidence | -0.043 239 | -0.331 *** 239 | 0.495 *** 239 | — — | | | | | | 5.05(1.95) |
| 5.Sadness | 0.087 239 | 0.384 *** 239 | -0.100 239 | -0.151 * 239 | — — | | | | | 2.00(2.24) |
| 6.Anxiety | 0.276 *** 239 | 0.706 *** 239 | -0.089 239 | -0.349 *** 239 | 0.557 *** 239 | — — | | | | 3.64(2.39) |
| 7.Interest | 0.302 *** 238 | -0.069 238 | 0.512 *** 238 | 0.453 *** 238 | -0.215 *** 238 | -0.129 * 238 | — — | | | 5.85(1.77) |
| 8.Boredom | -0.123 238 | 0.231 *** 238 | -0.201 ** 238 | -0.114 238 | 0.604 *** 238 | 0.346 *** 238 | -0.452 *** 238 | — — | | 2.04(2.26) |
| 9.Resignation | 0.140 * 238 | 0.338 *** 238 | -0.110 238 | -0.174 ** 238 | 0.663 *** 238 | 0.514 *** 238 | -0.200 ** 238 | 0.613 *** 238 | — — | 2.67(2.27) |
| 10.Appraisal | -0.129 * 239 | -0.305 *** 239 | 0.260 *** 239 | 0.523 *** 239 | -0.320 *** 239 | -0.420 *** 239 | 0.330 *** 238 | -0.229 *** 238 | -0.344 *** 238 | 5.28(1.95) |

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table M3A2*Subjective Feelings and Appraisal of Problem-Focused Coping Potential at Solving an Easy Task: Correlation Matrix, Means and Standard Deviations*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Mean (SD) |
|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------|
| 1.Challenge | — — | | | | | | | | | 4.56(2.22) |
| 2.Nervousness | 0.372 *** 239 | — — | | | | | | | | 3.13(2.39) |
| 3.Hope | 0.256 *** 239 | -0.089 239 | — — | | | | | | | 5.35(1.90) |
| 4.Confidence | -0.115 239 | -0.475 *** 239 | 0.492 *** 239 | — — | | | | | | 5.60(1.85) |
| 5.Sadness | 0.228 *** 239 | 0.536 *** 239 | -0.116 239 | -0.312 *** 239 | — — | | | | | 1.59(2.06) |
| 6.Anxiety | 0.332 *** 239 | 0.776 *** 239 | -0.019 239 | -0.410 *** 239 | 0.573 *** 239 | — — | | | | 2.84(2.34) |
| 7.Interest | 0.134 * 239 | -0.077 239 | 0.430 *** 239 | 0.423 *** 239 | -0.279 *** 239 | -0.061 239 | — — | | | 5.81(1.72) |
| 8.Boredom | 0.022 239 | 0.301 *** 239 | -0.265 *** 239 | -0.190 ** 239 | 0.670 *** 239 | 0.268 *** 239 | -0.510 *** 239 | — — | | 1.82(2.00) |
| 9.Resignation | 0.271 *** 239 | 0.401 *** 239 | -0.039 239 | -0.239 *** 239 | 0.602 *** 239 | 0.441 *** 239 | -0.191 ** 239 | 0.574 *** 239 | — — | 2.33(2.19) |
| 10.Appraisal | -0.245 *** 239 | -0.381 *** 239 | 0.141 * 239 | 0.426 *** 239 | -0.393 *** 239 | -0.404 *** 239 | 0.242 *** 239 | -0.264 *** 239 | -0.423 *** 239 | 6.33(1.39) |

Note. * p < .05, ** p < .01, *** p < .001

Table M3A3*Subjective Feelings and Appraisal of Problem-Focused Coping Potential at Solving a Difficult Task: Correlation Matrix, Means and Standard Deviations*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Mean (SD) |
|---------------|-------------------|------------------|------------------|-------------------|------------------|------------------|-------------------|------------------|------------------|------------|
| 1.Challenge | — — | | | | | | | | | 6.46(1.82) |
| 2.Nervousness | 0.321 *** 239 | — — | | | | | | | | 4.48(2.54) |
| 3.Hope | 0.074 239 | 0.074 239 | — — | | | | | | | 3.82(2.37) |
| 4.Confidence | 0.057 239 | -0.142 * 239 | 0.590 *** 239 | — — | | | | | | 3.85(2.29) |
| 5.Sadness | -0.067 239 | 0.376 *** 239 | -0.017 239 | -0.057 239 | — — | | | | | 2.62(2.49) |
| 6.Anxiety | 0.183 ** 239 | 0.722 *** 239 | 0.126 239 | -0.109 239 | 0.461 *** 239 | — — | | | | 4.09(2.42) |
| 7.Interest | 0.394 *** 239 | 0.072 239 | 0.490 *** 239 | 0.425 *** 239 | -0.160 * 239 | 0.085 239 | — — | | | 5.36(2.11) |
| 8.Boredom | -0.216 *** 239 | 0.172 ** 239 | 0.057 239 | 0.149 * 239 | 0.608 *** 239 | 0.252 *** 239 | -0.303 *** 239 | — — | | 2.32(2.34) |
| 9.Resignation | -0.040 239 | 0.193 ** 239 | -0.160 * 239 | -0.218 *** 239 | 0.487 *** 239 | 0.335 *** 239 | -0.195 ** 239 | 0.492 *** 239 | — — | 3.49(2.39) |
| 10.Appraisal | -0.119 239 | -0.043 239 | 0.407 *** 239 | 0.487 *** 239 | -0.005 239 | -0.027 239 | 0.194 ** 239 | 0.189 ** 239 | -0.187 ** 239 | 2.68(2.32) |

Note. * p < .05, ** p < .01, *** p < .001.

Table M3A4

Principle Component Analysis for Subjective Feelings Experienced during Easy Task: Component Loadings, Eigenvalues and Explained Variance

| | Component | | | Uniqueness |
|-------------------------|-----------|--------|-------|------------|
| | 1 | 2 | 3 | |
| Nervousness (easy task) | 0.853 | | | 0.194 |
| Anxiety (easy task) | 0.832 | | | 0.227 |
| Challenge (easy task) | 0.632 | | 0.349 | 0.474 |
| Boredom (easy task) | | 0.899 | | 0.135 |
| Sadness (easy task) | 0.433 | 0.762 | | 0.223 |
| Resignation (easy task) | 0.346 | 0.754 | | 0.310 |
| Hope (easy task) | | | 0.857 | 0.259 |
| Confidence (easy task) | -0.523 | | 0.734 | 0.187 |
| Interest (easy task) | | -0.448 | 0.668 | 0.333 |
| Eigenvalue | 3.618 | 1.853 | 1.188 | |
| % of explained variance | 40.2 | 20.59 | 13.20 | |
| Cumulative % | 40.2 | 60.8 | 74.0 | |

Note. 'varimax' rotation was used

Table M3A5

Principle Component Analysis for Subjective Feelings Experienced during Moderate Task: Component Loadings, Eigenvalues and Explained Variance

| | Component | | | Uniqueness |
|-----------------------------|-----------|-------|--------|------------|
| | 1 | 2 | 3 | |
| Boredom (moderate task) | 0.866 | | | 0.202 |
| Sadness (moderate task) | 0.832 | | | 0.244 |
| Resignation (moderate task) | 0.817 | | | 0.269 |
| Hope (moderate task) | | 0.826 | | 0.299 |
| Confidence (moderate task) | | 0.799 | -0.417 | 0.187 |
| Interest (moderate task) | -0.322 | 0.763 | | 0.281 |
| Nervousness (moderate task) | | | 0.794 | 0.279 |
| Challenge (moderate task) | | | 0.722 | 0.384 |
| Anxiety (moderate task) | 0.478 | | 0.718 | 0.228 |
| Eigenvalue | 3.354 | 1.967 | 1.307 | |
| % of explained variance | 37.27 | 21.85 | 14.53 | |
| Cumulative % | 37.27 | 59.1 | 73.6 | |

Note. 'varimax' rotation was used

Table M3A6

*Principle Component Analysis for Subjective Feelings Experienced during
Difficult Task: Component Loadings, Eigenvalues and Explained Variance*

| | Component | | | Uniqueness |
|------------------------------|-----------|-------|-------|------------|
| | 1 | 2 | 3 | |
| Boredom (difficult task) | 0.880 | | | 0.196 |
| Sadness (difficult task) | 0.812 | | | 0.286 |
| Resignation (difficult task) | 0.682 | | | 0.460 |
| Confidence (difficult task) | | 0.880 | | 0.195 |
| Hope (difficult task) | | 0.861 | | 0.250 |
| Interest (difficult task) | -0.364 | 0.656 | 0.380 | 0.293 |
| Nervousness (difficult task) | 0.304 | | 0.820 | 0.232 |
| Anxiety (difficult task) | 0.456 | | 0.743 | 0.240 |
| Challenge (Difficult task) | -0.328 | | 0.685 | 0.409 |
| Eigenvalue | 2.729 | 2.175 | 1.534 | |
| % of explained variance | 30.32 | 24.16 | 17.05 | |
| Cumulative % | 30.32 | 54.5 | 71.5 | |

Note. 'varimax' rotation was used

Table M3A7

Means and Standard Deviations for Childhood socioeconomic status, Self-efficacy, Subjective Feelings during the Trials, Appraisal of Problem-Focused Coping Potential, and Attribution of the Outcome

| | Easy task | | Moderate task | | Difficult task | |
|--|-----------|------|---------------|------|----------------|------|
| | Mean | SD | Mean | SD | Mean | SD |
| Childhood socioeconomic status | 2.81 | 1.06 | 2.81 | 1.06 | 2.81 | 1.06 |
| Self-efficacy beliefs | 5.17 | 1.46 | 5.17 | 1.46 | 5.17 | 1.46 |
| Interest | 5.81 | 1.72 | 5.85 | 1.77 | 5.36 | 2.11 |
| Boredom | 1.82 | 2.00 | 2.04 | 2.26 | 2.32 | 2.34 |
| Feelings of anxiety | 2.98 | 2.23 | 3.87 | 2.18 | 4.28 | 2.30 |
| Feelings of resignation | 1.96 | 1.90 | 2.33 | 2.05 | 3.05 | 2.10 |
| Feelings optimistic | 5.47 | 1.62 | 5.06 | 1.65 | 3.83 | 2.08 |
| Appraisal of problem-focused coping potential | 6.33 | 1.39 | 5.28 | 1.95 | 2.68 | 2.32 |
| Attributing outcome to chance/luck | 3.38 | 2.48 | 3.39 | 2.44 | 3.34 | 2.36 |
| Attributing outcome to effort | 5.70 | 1.68 | 5.59 | 1.89 | 5.31 | 1.89 |
| Attributing outcome to capability to solve similar tasks | 5.52 | 1.77 | 5.39 | 1.93 | 4.97 | 1.96 |