Financial decisions matter: promoting positive financial behaviour, financial satisfaction, and financial well-being

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Chapter 5

How executive functioning and financial self-efficacy predict subjective financial well-being via positive financial behaviors

This research was submitted for publication.

Financial well-being is an important research topic, as its benefits are far-reaching, and extend beyond the financial domain. At the individual and family level, financial well-being is positively related to quality of life, physical and mental health, relationship quality, and happiness—all ingredients of general well-being (Brüggen et al., 2017; Netemeyer, Warmath, Fernandes, & Lynch, 2018). At the organizational level, financial well-being of employees benefits organizations through engagement, loyalty, and productivity, and thereby profitability (Krekel, Ward, & De Neve, 2019; Netemeyer et al., 2018). And, at the societal level, financial well-being is associated with more welfare because it leads to more spending capacity and less reliance on social security (Brüggen et al., 2017). Against this background, financial practitioners and service providers, among others, work to lead individuals and families to a better state of financial well-being. Hence, a solid understanding of what factors determine financial well-being is crucial.

Individuals who display positive financial behaviors, such as active saving and working toward financial goals, likely have more control over their money to meet both their current and future financial obligations. Consequently, they have less stress about their current financial state and higher expectations regarding their future financial state, thus experiencing greater financial well-being. Several studies support this reasoning, showing that positive financial behaviors are a powerful predictor of financial well-being (Brüggen et al., 2017; Gutter & Copur, 2011; Riitsalu & Murakas, 2019; Riitsalu & Van Raaij, 2020). However, not all individuals express positive financial behaviors to the same degree and in the same way, so it is important to identify the individual factors that can influence these behaviors and, through these behaviors, also financial well-being.

Individuals need executive functions (those cognitive skills that enable higher-order thinking) to set financial goals and work toward them, resist impulses and stick to a budget, and decide when to save and when to buy (CFPB, 2015)—all positive financial behaviors

that contribute to financial well-being. Prior studies have not empirically addressed the suggested indirect relation of executive functions with financial well-being via positive financial behaviors. Related work has yielded mixed results. Drever et al. (2015) showed that a positive relation exists between executive functioning and positive financial behaviors, and between executive functioning and financial well-being. In contrast, Strömbäck, Skagerlund, Västfjäll, and Tinghög (2020) showed no significant relation between these three variables. The present study aims to shed some more light on the relation between executive functions, on the one hand, and positive financial behaviors and financial well-being, on the other.

Financial self-efficacious individuals (those with strong beliefs in their capacity to successfully complete a task or achieve a goal) are better able to effectively manage their personal and family finances, leading to a positive financial state in both the short and the long term. Also here, there is no empirical evidence on the suggested indirect relation of financial self-efficacy with financial well-being via positive financial behaviors. In support of such an indirect relation, related work has found a positive relation between financial self-efficacy and positive financial behaviors (Farrell, Fry, & Risse, 2016; Forbes & Kara, 2010), and between financial self-efficacy and financial well-being (Serido & Shim, 2017; Vosloo, Fouché, & Barnard, 2014). The present study broadens available work by establishing that the relation between financial self-efficacy and financial well-being occurs via positive financial behaviors.

Executive functions help individuals access their higher-order thinking, while financial self-efficacy helps them to engage in successful implementation. Apart from these separate benefits, we argue that, combined, these factors enable individuals to think and act effectively, leading them to identify more savvy financial behaviors and act upon them to advance their financial well-being. That is, the relationship between financial self-efficacy and positive financial behaviors may depend on the level of executive functioning. For

example, the higher individuals' level of executive functions, such as self-control, planning, and organizing, the better they can use their beliefs in their abilities to successfully meet financial goals, thereby helping them to identify appropriate positive financial behaviors. Similarly, the impact of executive functioning on positive financial behaviors may depend on the level of financial self-efficacy. The stronger individuals' beliefs in their capacities, the more their executive function skills can guide them to engage in positive financial behaviors. In both cases, positive behaviors may increase financial well-being. To our knowledge, no studies have investigated the moderating influence of executive functions and/or financial self-efficacy on financial well-being via positive financial behaviors. Yet, some studies have examined the moderating role of executive functions or financial self-efficacy for the two constructs separately, that is, for positive financial behaviors and financial well-being. For example, Drever et al. (2015) indicated that executive functions moderate the relation of environmental factors (e.g., poverty, stress) with both positive financial behaviors and financial well-being. Financial self-efficacy has been found to moderate the association between money attitudes and financial literacy, on the one hand, and positive financial behaviors, on the other (Bari, Yunanto, & Shaferi, 2020; Qamar, Khemta, & Jamil, 2016), as well as between credit card literacy and satisfaction with remuneration, on the one hand, and financial well-being, on the other (Limbu & Sato, 2019; Vosloo et al., 2014). The just-described moderating effects of executive functions and financial self-efficacy on either positive financial behaviors or financial well-being, together with the finding that positive financial behaviors and financial well-being are associated, testify to the possible moderating roles of executive functioning and financial self-efficacy in predicting financial well-being via positive financial behaviors.

The contribution of our study is threefold. First, we examined whether executive functioning and financial self-efficacy predict financial well-being via positive financial

behaviors, which has been proposed as a promising path, but has not been empirically tested directly before (CFPB, 2015). Second, we tested the moderating roles of executive functioning and financial self-efficacy in predicting financial well-being via positive financial behaviors, which, to our knowledge, has not been previously studied. If executive functioning and financial self-efficacy indeed influence each other, financial practitioners have another avenue to better individuals' financial behaviors and financial well-being, by using strategies that combine the two factors in their interventions and practices. Third, we assessed financial self-efficacy, which is a different concept from financial confidence. Whereas the impact of financial confidence on financial well-being through financial behaviors has been studied, such an examination is lacking for financial self-efficacy (Kempson, Finney, & Poppe, 2017). Confidence refers to having a strong belief, but this belief may concern something positive or negative (e.g., strong belief that one is able or unable to accomplish something), whereas self-efficacy entails having a strong, positive belief that one has the ability to achieve a task or goal (Bandura, 1977, 1997). Thus, we think that focusing on self-efficacy may help us better understand the association between positive financial behaviors and financial well-being. Finally, our study fits with the recommendation for further research on individual factors that predict financial well-being (Wilmarth, 2020). Findings from this study could provide financial practitioners and service providers, among others, with novel insights to help individuals and families improve their financial behaviors and their financial well-being by increasing executive functioning and financial self-efficacy.

Literature review

Financial well-being

The current literature lacks generally accepted definitions and measurements of financial well-being. Research on financial well-being can be classified into three categories: (a) both objective and subjective elements, (b) objective elements only, and (c) subjective elements only (Brüggen et al., 2017). Objective elements concern individuals' actual financial condition, such as income, assets, and debt. Subjective elements involve how individuals assess their own financial condition, such as their satisfaction with their standard of living or financial status. Individuals with an identical objective financial well-being can have very different levels of subjective financial well-being. As an illustrative example, two individuals have a similar income of £2,000 per month. However, one individual overspends and ends up frustrated due to excessive debt, while the other individual spends responsibly and saves, thereby enjoying life. Consequently, although both individuals enjoy the same objective financial well-being, the latter will likely report greater subjective financial well-being than the former. Hence, in the current study, we opted for a subjective measure, because it implies a broader, intangible interpretation of the concept of financial well-being, whereas an objective approach provides a more limited, tangible interpretation (see e.g., Peterson & Bush, 2013).

With respect to subjective financial well-being specifically, there seems to be agreement on two dimensions in the literature, namely current financial stress and expected future financial security (CFPB, 2015; Netemeyer et al., 2018). Current financial stress encompasses having insufficient financial resources and lacking control over one's present financial situation. Expected future financial security refers to being able to meet one's distant financial goals. The Consumer Financial Protection Bureau (CFPB, 2015) was among the first to develop a single measure for both dimensions. This measure, however, focused

more on the current dimension than the future one. Hence, recent research recommends using two measures, to enable an equal assessment of the two dimensions (Netemeyer et al., 2018).

Determinants of financial well-being

The CFPB (2015) carried out extensive qualitative research to develop a conceptual framework of the determinants of financial well-being. In this framework, positive financial behaviors (those behaviors that lead to effective financial decisions) were identified as the most powerful determinant of financial well-being and these behaviors, in turn, were found to be affected by individual factors. Among these factors, executive functions and financial self-efficacy were marked as important, which is particularly relevant for the current study. According to the CFPB, executive functions help individuals to plan ahead, control impulses, and think creatively to handle unanticipated challenges, and financial self-efficacy help individuals to believe in their ability to influence financial outcomes. The CFPB framework provides a good theoretical foundation, but is limited because the identified relationships were not empirically tested.

Subsequent studies used similar elements as this framework and showed that several individual factors, such as knowledge, skills, attitudes, and psychological traits, were related to financial well-being via positive financial behaviors (Iramani & Lutfi, 2021; Kempson et al., 2017; Selvia, Rahmayanti, Afandy, & Zoraya, 2020). However, to our knowledge, none of these studies empirically examined the role of executive functions and financial self-efficacy in predicting positive financial behaviors and, in turn, financial well-being. Thus, the current study fills this gap and provides possible strategies for financial practitioners and service providers, among others, to help individuals and families better their financial behaviors and financial well-being. In the following, we discuss the path of executive functions and financial self-efficacy to financial well-being via positive financial behaviors.

Executive functioning, positive financial behaviors, and financial well-being

Executive functioning consists of a set of mental processes or cognitive abilities or skills necessary for goal-directed behavior (Diamond, 2013; Van der Elst et al., 2012). In the literature, there is agreement on at least three core executive functions: (a) attention, (b) self-control and self-monitoring, and (c) planning and initiative. Attention involves holding (verbal and nonverbal) information in mind and working on it, thereby seeing connections between what happened earlier and what comes later. Self-control and self-monitoring regard controlling one's behavior to resist dysfunctional habits and temptations. Planning and initiative build on the previous two executive functions because these enable one to change perspectives by deactivating previous perspectives (self-control and self-monitoring) and activating new perspectives (attention). Together, these three core executive functions allow for higher-order thinking, such as reasoning and problem solving (Collins & Koechlin, 2012). These executive function skills can help individuals engage in positive financial behaviors. To illustrate, establishing financial goals and remaining focused on them might prevent the use of overdrafts and promote paying bills on time. Similarly, overriding urges and impulses that push away from financial goals enables responsible spending and tracking expenses. Likewise, being able to plan and organize how to achieve financial goals can instigate active saving and investing. All these positive financial behaviors, in turn, may increase financial well-being.

Studies have shown that executive functioning is an important contributor to several well-being outcomes, such as mental health (Fairchild et al., 2009), physical health (Miller, Barnes, & Beaver, 2011), and quality of life (Brown & Landgraf, 2010). In the current study, we argue that this relation is also present in the financial domain. Specifically, as illustrated earlier, we posit that executive functioning supports positive financial behaviors which, in turn, contribute to financial well-being. To date, no studies have empirically tested this

indirect relationship. There is evidence on both the relationship between executive functioning and positive financial behaviors, and between executive functioning and financial well-being (Drever et al., 2015; Strömbäck et al., 2020), but this evidence is limited and mixed. Whereas some studies showed positive relations between aforementioned three variables (Drever et al., 2015), other studies found no significant relations (Strömbäck et al., 2020). Thus, the empirical question remains of whether executive functioning can contribute to financial well-being via its association with positive financial behaviors.

Financial self-efficacy, positive financial behaviors, and financial well-being

Self-efficacy, a concept originally proposed by Bandura (1977, 1997), refers to individuals' beliefs in their own capacity to successfully complete a task or meet a goal. Self-efficacious individuals generally consider complex tasks as challenges to overcome, establish a deep interest in their tasks, set challenging goals and remain committed to meeting them, and recover rapidly from problems and disappointments. The concept of financial self-efficacy is related to Bandura's self-efficacy theory, involving the perceived ability to complete financial tasks and meet financial goals (Lapp, 2010). The higher individuals' financial self-efficacy, the more motivated they are to master financial challenges. This, subsequently, can promote positive financial behaviors, like working toward financial goals, and, in turn, increase financial well-being.

It is well documented that self-efficacy predicts successful well-being outcomes, such as mental health (Tahmassian & Moghadam, 2011), physical health (Rimal & Moon, 2009), and quality of life (Banik et al., 2018). In the current study, we argue that this relation is also present in the financial sphere. Specifically, as described earlier, we posit that financial self-efficacy supports positive financial behaviors which, in turn, contribute to financial well-being. So far, there are no studies that have empirically addressed this indirect relation.

Related previous work has shown that financial self-efficacy is positively associated with positive financial behaviors, such as investing and (retirement) saving (CFPB, 2018; Farrell, Fry, & Risse, 2016; Forbes & Kara, 2010). Some studies also showed that financial self-efficacy is positively related to financial well-being (Sabri, Wijekoon, & Rahim, 2020; Vosloo, Fouché, & Barnard, 2014). Again here, however, the empirical question remains of whether financial self-efficacy can contribute to financial well-being through its connection to positive financial behaviors.

Conceptual framework of the present study

The preceding literature review provides a solid foundation to develop the conceptual framework of the present study. We postulated that executive functions and financial self-efficacy, separately and in combination, predict positive financial behaviors, which, in turn, predict financial well-being. Figure 1 presents our conceptual framework.

We hypothesized that executive functions are positively related to financial well-being via positive financial behaviors (H1 in Figure 1). We also hypothesized that financial self-efficacy is positively related to financial well-being via positive financial behaviors (H2 in Figure 1). Furthermore, we hypothesized that the relationship as described in Hypothesis 1 is stronger with increasing levels of financial self-efficacy (H3a in Figure 1). And we hypothesized that the relationship as described in Hypothesis 2 is stronger with increasing levels of executive functioning (H3b in Figure 1). We treated all demographic factors as control variables.

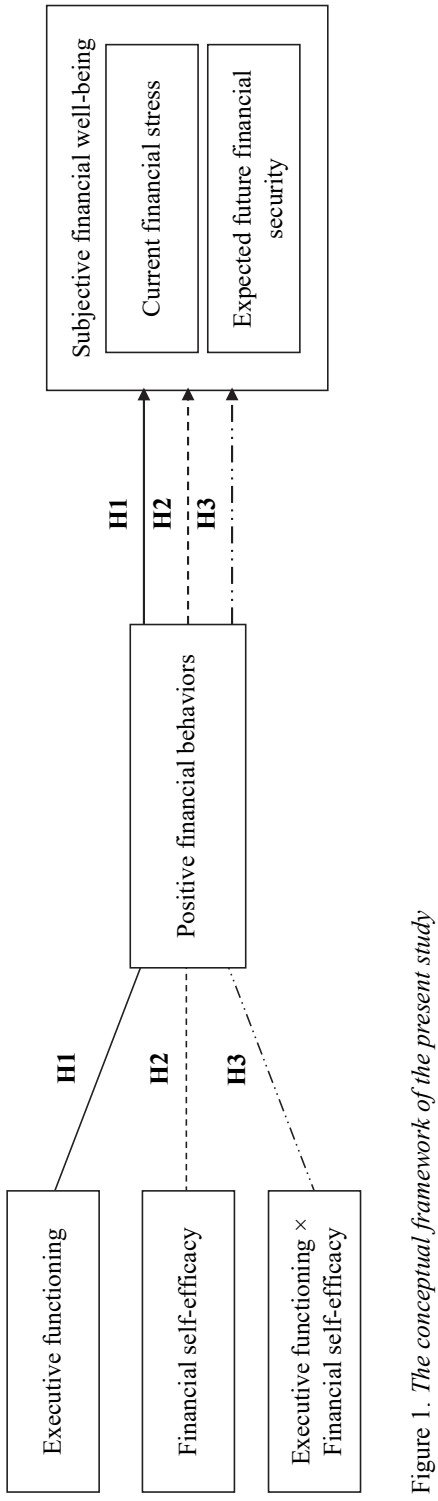

Figure 1. *The conceptual framework of the present study*

Method

Participants and study design

Using the software program G*Power, we approximated the power of the coefficient tests with an Ordinary Least Squares (OLS) power analysis to calculate the required sample size for the present study. The power analysis suggested a sample of 406 respondents. However, because our pilot study (including 20 respondents randomly sampled) revealed that 20% of the respondents were not responsible (personally or jointly) for their households' day-to-day financial decisions, one of our requirements for participation in the present study, we decided to recruit a larger sample of 488 respondents.

The aim was to obtain .90 power to detect a small effect size of Cohen's d .05 given the standard .05 alpha error probability. Respondents were selected to obtain a representative sample of the UK population and they completed the survey during 10-12 December 2020. We collected the data through the online platform Prolific (www.prolific.com). According to the guidelines of this platform, we paid each respondent £1.25 for 10 minutes to complete the survey. The representative sample was stratified across age, gender, and ethnicity. To improve the quality of our data, we considered the following aspects: (a) requesting respondents to manually indicate their unique Prolific ID and the unique survey completion code, (b) including a captcha, (c) preventing ballot box stuffing, and (d) manually approving the data to check whether the time spent on completing the survey was not unreasonably fast.

From the collected sample of 488 respondents, only data from respondents who lived in the UK, who were a native English speaker, and who were responsible (personally or jointly) for their households' day-to-day financial decisions were included in the present study. This resulted in a sample of 411 respondents between the ages of 18 and 88 years (M_{age}

= 48 years, *SD* = 14.62; 48.4% male and 51.6% female).[37] Among the sample, 25.3% had less than upper secondary education, 16.3% had upper secondary education, 8.8% had higher professional education, 33.8% had undergraduate university education, and 15.8% had postgraduate university education. More than one-third of the sample (37.5%) was employed full-time, 15.3% were employed part-time, 8.5% were self-employed, 6.1% were unemployed, 19.5% were (semi-)retired, and 13.1% were not employed for other reasons (e.g., students, disabled, and caretakers). The mean effective monthly household income was £2,023 (*SD* = 1,399), and the mean subjective socioeconomic status score was 5.51 (*SD* = 1.55). The Psychology Research Ethics Committee of Leiden University approved the study (V1–2513, December 2020). All hypotheses, measures, and analyses for this study were preregistered at Open Science Framework (OSF, https://osf.io/pfz8k/).

Measures

Subjective financial well-being. We measured two components of subjective financial well-being: (a) current financial stress and (b) expected future financial security.

For current financial stress, we used the 5-item version of the Psychological Inventory of Financial Scarcity (PIFS) Scale (Van Dijk, Van der Werf, & Van Dillen, 2021; see Table 1, for the five items), which has a strong internal consistency (Cronbach's α = .92-.95) and a strong construct validity based on five large-scale survey-based samples (*N* = 1,122-4,901). The PIFS assesses the subjective experience of financial scarcity and covers stress appraisals (i.e., insufficient financial resources and lack of control over one's financial situation) and stress responses (i.e., financial rumination and worry, and a short-term focus). Answers were provided on a 7-point Likert scale ranging from 1 (*does not describe me at all*) to 7 (*describes me completely*). An exploratory factor analysis using maximum likelihood

[37]Because only three respondents identified themselves as other genders (1% of the sample), we treated these answers as missing.

extraction and promax rotation with Kaiser normalization yielded one factor, explaining 70% of the variance (Eigenvalue = 3.5) with factor loadings from .698 to .895. Thus, we computed factor scores for current financial stress using all 5 items based on regression coefficients (Cronbach's α = .89).

For expectations regarding one's future financial security, we used the 5-item expected future financial security subscale of the Perceived Financial Well-Being Scale (Netemeyer et al., 2018; see Table 1, for the five items), which has a strong internal consistency (Cronbach's α = .90-.93) and a strong construct validity based on three large-scale survey-based samples (*N* = 3,000-6,000). Answers were provided on a 7-point Likert scale ranging from 1 (*does not describe me at all*) to 7 (*describes me completely*). An exploratory factor analysis using maximum likelihood extraction and promax rotation with Kaiser normalization yielded one factor, explaining 77% of the variance (Eigenvalue = 3.9) with factor loadings from .729 to .952. Thus, we computed factor scores for expected future financial security using all 5 items based on regression coefficients (Cronbach's α = .93).[38] [39]

[38]We used the expected future financial security subscale of the Perceived Financial Well-Being Scale, because all items consistently represented aspects regarding one's financial future. We did not use the current financial stress subscale of the aforementioned scale, because it captures items related to lack of money and lack of control over one's financial situation only (i.e., stress appraisals). Instead, we used the PIFS, because the latter covers both stress appraisals and stress responses (e.g., financial rumination and worry).

[39]To assess that item 1 of expected future financial security (the revised item) did not impact our estimates, we conducted a robustness check by performing a path analysis that included expected future financial security without the aforementioned item. Results were practically equivalent in both cases, thereby indicating that the financially secure item did not affect our estimates. As the results did not differ, we decided to use the expected future financial security scale including all items, as described in the main text. The path analysis with the expected future financial security variable excluding the aforementioned item is available online at: https://osf.io/4aqkr/.

Table 1. *Items for subjective financial well-being*

Statement
Current financial stress
1. I often don't have enough money.
2. I experience little control over my financial situation.
3. I am constantly wondering whether I have enough money.
4. I worry about money a lot.
5. I am only focusing on what I have to pay at this moment rather than my future expenses.
Expected future financial security
1. I am financially secure. (original statement: I am *becoming* financially secure)
2. I am securing my financial future.
3. I will achieve the financial goals that I have set for myself.
4. I have saved (or will be able to save) enough money to last me to the end of my life.
5. I will be financially secure until the end of my life.

Note. The adapted text is printed in italics.

Positive financial behaviors. We used seventeen positive financial behaviors, covering several topics, namely paying bills on time, paying credit card bills in full, paying mortgage or rent, having emergency funds, and having investments, as proposed by Wagner and Walstad (2018); tracking expenses, staying within budget plan, shopping around, paying loans above minimum, and saving without goals from the Financial Management Behavior Scale (FMBS) developed by Dew and Xiao (2011); and reviewing credit report, saving for long-term goals, working toward financial goals, figuring out retirement saving, saving for retirement, responsible spending, and using overdrafts responsibly as presented by Kim, Anderson, and Seay (2019) (see Table 2, for all assessed items). Answers were provided on a 7-point Likert scale ranging from 1 (never) to 7 (always). Initial exploratory factor analysis using maximum likelihood extraction and promax rotation with Kaiser normalization yielded five factors (Eigenvalue of the first factor = 5.2, Eigenvalue of the other four factors = 1.5, 1.2, 1.1, and 1.0, respectively). Because we observed a large drop-off between the first factor (Eigenvalue = 5.2) and the second factor (Eigenvalue = 1.5), a distinction between different factors is not needed and, therefore, we proceeded with one factor. This factor explained 33% of the variance with the highest factor loading being .827, 13 items with factor loadings greater than .300, and only 2 items with factor loadings below .250. Only item 8 (shopping

around) had a very low factor loading of .023, so we decided to exclude it. Thus, we performed an additional exploratory factor analysis using maximum likelihood extraction in which we restricted the number of factors to one, and computed factor scores for positive financial behaviors using the remaining 16 items based on regression coefficients (Cronbach's $\alpha = .85$).[40]

Table 2. *Items for positive financial behaviors*

Topic	Statement
Paying bills on time	1. I paid my bills on time.
Paying loans above minimum	2. I made only minimum payments on my loans. Please do not include your mortgage or rent payments.*
Paying mortgage or rent	3. I made my mortgage or rent payments.
Paying credit card bills in full	4. I paid my credit card bills in full.
Keeping track of expenses	5. I kept a written or electronic record of my expenses.
Reponsible spending	6. I spent more than my income. Please do not include the purchase of a new house or car, or other big investments you may have made.*
Staying within budget plan	7. I stayed within my (household) budget or spending plan.
Shopping around	8. I compared products or services before purchasing them.**
Using overdrafts responsibly	9. I overdrew my checking account.*
Reviewing credit report	10. I reviewed my credit report to monitor my financial reputation (good credit).
Having emergency funds	11. I set aside emergency or rainy day funds that would cover my expenses for 3 months, in case of sickness, job loss, economic downturn, or other emergencies.
Saving without goals	12. I saved money from every paycheck.
Saving for long-term goals	13. I saved money for long-term goals such as education, a car, or a home.
Working toward financial goals	14. I set long-term financial goals and strived to achieve them.
Figuring out retirement saving	15. I tried to figure out how much I need to save for retirement.
Saving for retirement	16. I put money into one or more retirement plans (either through an employer or not).
Having investments	17. Not including retirement accounts, I invested money in stocks, bonds, mutual funds, or other securities.

Note. * reverse scored, ** excluded from the positive financial behaviors variable.

[40]To assess whether the inclusion of the items 15 and 16 impacted our results, we ran a robustness check in which we conducted a path analysis with and without these items in the positive financial behaviors variable. Results were practically equivalent in both cases, thereby indicating that the two retirement items did not affect our estimates. As the results did not differ, we decided to use the positive financial behaviors variable, as described in the main text. The path analysis with the positive financial behaviors variable excluding the aforementioned items is available online at: https://osf.io/4aqkr/.

Executive functioning. We used the 13-item Amsterdam Executive Function Inventory (AEFI; Van der Elst et al., 2012; see Table 3, for the thirteen items). The AEFI measures the three core executive functions: (a) attention (three items), (b) self-control and self-monitoring (five items), and (c) planning and initiative (five items). Answers were provided on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Initial exploratory factor analysis using maximum likelihood extraction and promax rotation with Kaiser normalization yielded two factors (the first factor with a large Eigenvalue of 5.1, the second factor with a small Eigenvalue of 2.0). The factor loadings method, however, revealed that only items 12 and 13 explained the second factor. For this reason, we removed these two items and continued with one factor. This factor explained 45% of the variance with factor loadings from .372 to 914. Thus, we performed an additional exploratory factor analysis using maximum likelihood extraction in which we restricted the number of factors to one, and computed factor scores for executive functioning using the remaining 11 items based on regression coefficients (Cronbach's $\alpha = .88$).

Table 3. *Items for executive functioning*

Attention
1. I am not able to focus on the same topic for a long period of time.*
2. I am easily distracted.*
3. My thoughts easily wander.*
Self-control and self-monitoring
4. I often react too fast. I've done or said something before it is my turn.*
5. It is difficult for me to sit still.*
6. It takes a lot of effort for me to remember things.*
7. I often forget what I have done yesterday.*
8. I often lose things.*
Planning and initiative
9. I can make fast decisions.
10. I am well-organized. For example, I am good at planning what I need to do during a day.
11. It is easy for me to come up with a different solution if I get stuck when solving a problem.
12. I am full of new ideas.**
13. I am curious, I want to know how things work.**

Note. * reverse scored. ** excluded from the executive functioning variable.

Financial self-efficacy. We used the 5-item Financial Self-Efficacy Scale (Montford & Goldsmith, 2016; see Table 4, for the five items). Answers were provided on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). An exploratory factor analysis using maximum likelihood extraction and promax rotation with Kaiser normalization yielded one factor, explaining 73% of the variance (Eigenvalue = 3.7) with factor loadings from .700 to .949. Thus, we computed factor scores for financial self-efficacy using all 5 items based on regression coefficients (Cronbach's α = .90).

Table 4. *Items for financial self-efficacy*

Statement
1. I am fully capable of making personal *financial* decisions.
2. I am confident in my ability to make personal *financial* decisions.
3. I do not feel I am qualified for the task of making personal *financial* decisions.*
4. Using *financial* information available is well within the scope of my abilities.
5. My past experiences increase my confidence that I will be able to successfully make personal *financial* decisions.

Note. The term 'financial' was 'investment' in the original scale. * reverse scored.

Demographic control variables. We used gender (female and male), age (continuous: ranging from 18 to 88 years old), education (five categories: less than upper secondary education, upper secondary education, higher professional education, undergraduate university education, and postgraduate university education), occupation (six categories: employed part-time, [semi-] retired, self-employed, unemployed, not employed for other reasons, and employed full-time), effective income[41] (continuous: ranging from £66 to £9,374), and subjective socioeconomic status (continuous: ranging from 1 to 9) as the demographic control variables (see Table 5). Previous research has shown that said variables were related to positive financial behaviors and/or financial well-being (see e.g., Kempson & Poppe, 2018). We used the last category of education and occupation as the reference group.

[41]Previous research supports the use of effective income as a continuous variable, which is calculated by estimating household income as the midpoint of each income bracket and dividing it by the household size (see e.g., Buhmann & Rainwater, 1988; Plantinga, Breugelmans, & Zeelenberg, 2018).

Table 5. *Demographic control variables*

Topic	Question	Possible responses
Gender	1. What is your gender?	Multiple choice: • Male • Female • Other
Age	2. What is your age?	Open response
Education	3. What is the highest level of education that you have completed?	Multiple choice: • I have no formal qualifications • GCSE/O-Level/CSE • Vocational qualifications such as Apprenticeships or City and Guilds • A-Level, Scottish Higher, Welsh Baccalaureate, International Baccalaureate or equivalent • Diplomas in higher education, HNC/HND/BTEC Higher or equivalent • First degree level qualification (including Foundation degree, Bachelor Degree, PGCE or equivalent) • University higher degree (e.g. Masters/PhD or equivalent) • Other
Occupation	4. What is your current employment status? If more options apply, please indicate the most applicable option.	Multiple choice: • Employed full-time (for 30 or more hours per week) • Employed part-time (for less than 30 hours per week) • Self-employed full-time (for 30 or more hours per week) • Self-employed part-time (for less than 30 hours per week) • Unemployed and looking for work • Unemployed and not looking for work • Retired • Semi-retired (drawing a pension or other income sources but still working) • Student • Permanently sick/ disabled • Looking after the home • Other
Subjective socioeconomic status	5. Think of a ladder as representing where people stand in the United Kingdom. At the top of the ladder are the people who have the most money, most education, and most respected jobs. At the bottom are the people who have the least money, least education, and least respected jobs or no job. The higher up you are on this ladder, the closer you are to the people at the very top, and the lower you are, the closer you are to the people at the very bottom. Where would you place yourself on this ladder?	Slider ranging from 1 to 10. 

		Please select the rung where you think you stand at this time in your life (10 being the top rung) relative to other people in the United Kingdom.	
Effective income_1	6.	Which band from the grid below does your household's total gross income from all sources fall into? "Income" is any money from work, including a second job or occasional work, and any other sources, such as benefits, pensions, savings and investments, maintenance payments and rent from property or subletting. "Gross" means the amount you receive before any deductions, income tax, National Insurance etc.	Multiple choice: • up to £86 per week/ up to £374 per month/ under £4,500 per year • £87-£124 per week/ £375-£541 per month/ £4,500-6,499 per year • £125-£143 per week/ £542-£624 per month/ £6,500-£7,499 per year • £144-£182 per week/ £625-£791 per month/ £7,500-£9,499 per year • £183-£220 per week/ £792-£957 per month/ £9,500-£11,499 per year • £221-£259 per week/ £958-£1,124 per month/ £11,500-£13,499 per year • £260-£297 per week/ £1,125-£1,291 per month/ £13,500-£15,499 per year • £298-£336 per week/ £1,292-£1,457 per month/ £15,500-£17,499 per year • £337-£384 per week/ £1,458-£1,666 per month/ £17,500-£19,999 per year • £385-£480 per week/ £1,667-£2,082 per month/ £20,000-£24,999 per year • £481-£576 per week/ £2,083-£2,499 per month/ £25,000-£29,999 per year • £577-£672 per week/ £2,500-£2,916 per month/ £30,000-£34,999 per year • £673-£768 per week/ £2,917-£3,332 per month/ £35,000-£39,999 per year • £769-£961 per week/ £3,333-£4,166 per month/ £40,000-£49,999 per year • £962-£1,441 per week/ £4,167-£6,249 per month/ £50,000-£74,999 per year • £1,442-£1,992 per week/ £6,250-£8,332 per month/ £75,000-£99,999 per year • £1,993+ per week/ £8,333+ per month/ £100,000+ per year
Effective income_2	7.	Including you, how many adults aged 18 or over are currently living in your household?	Open response
Effective income_3	8.	How many children aged 17 or under are financially dependent on you and/or your partner/spouse? Please include all children, whether they currently live with you or not.	Open response

Note. The used education categories represent the education categories commonly used in the United Kingdom (see MAS, 2018). GCSE/O-Level/CSE represents lower secondary education, Vocational qualifications such as Apprenticeships or City and Guilds represents secondary vocational education, A-Level, Scottish Higher, Welsh Baccalaureate, International Baccalaureate or equivalent represents upper secondary education, Diplomas in higher education, HNC/HND/BTEC Higher or equivalent represents higher professional education, First degree level qualification (including Foundation degree, Bachelor Degree, PGCE or equivalent) represents

undergraduate university education, University higher degree (e.g. Masters/PhD or equivalent) represents postgraduate university education.

Data analysis

Missing values. Between 0.2% (financial self-efficacy) and 35% (positive financial behaviors) of the data were missing. As shown by Little's (1988) test, χ^2 = 6,644.37, *df* = 6,386, *p* = .012, the data were not missing completely at random. Following the approach of Von Hippel (2018), we used multiple imputations with twenty-six plausible datasets[42] based on a Markov Chain Monte Carlo (MCMC) method known as fully conditional specification (FCS).

Path analysis. We used the pathj module of the open-source jamovi statistical platform (Gallucci, 2019; The jamovi project, 2021), based on the lavaan R package (Rosseel, 2012), for our path analyses. This method enabled us to test the compatibility of our conceptual moderated mediation model (see Fig. 1) with our dataset. Results consisted of indirect, direct, and total effects (Jeon, 2015). Indirect effects were the relations between the independent and the dependent variables that operated via the intermediate variable. Direct effects were the relations between the independent and the dependent variables, *ceteris paribus*. Total effects were the sum of direct and indirect effects. All effects were standardized coefficients estimated through maximum likelihood.

We developed a path analysis using executive functioning and financial self-efficacy as the independent variables, positive financial behaviors as the intermediate variable, and current financial stress and expected future financial security as the dependent variables, and tested Hypothesis 1 and Hypothesis 2. This path analysis also included subjective

[42]The number of imputations was calculated as follows: $M = 1 + \frac{1}{2}\left(\frac{FMI}{CV(SE)}\right)^2$, where FMI is the fraction of missing information and $CV(SE)$ is the percentage that the standard error estimate is allowed to change if the data were imputed again. In the present study, FMI = 35% and $CV(SE)$ = 5%, resulting in M = 25 or 26.

socioeconomic status, age, effective income, and occupation together as the control variables.[43] Subsequently, we incorporated the interaction of executive functioning and financial self-efficacy in the path analysis, and tested Hypothesis 3a and Hypothesis 3b.

Results

Correlation results

Table 6 depicts the correlation coefficients of all study variables. A correlation analysis revealed that almost all individual variables (i.e., executive functioning, financial self-efficacy, subjective socioeconomic status, age, education, effective income, and occupation) were significantly related to current financial stress, expected future financial security, and/or positive financial behaviors ($p < .05$), except for gender ($r = .09$, $p = .063$, $r = -.08$, $p = .095$, and $r = -.09$, $p = .072$, respectively). Among the independent variables, the analysis also showed that no multicollinearity problems were present (see e.g., Landau & Everitt, 2004).[44]

[43]We excluded gender because the correlation analysis revealed that it did not have a significant relation with neither the dependent variables (current financial stress and future financial security) nor the intermediate variable (positive financial behaviors). In addition, our preliminary path analysis including subjective socioeconomic status, age, effective income, occupation, and education together as control variables showed high correlation among the dummies for occupation and education. Therefore, it was not possible to use this model with all these control variables together. Consequently, we tested one model excluding occupation only and another model excluding education only. These analyses revealed that occupation was a significant predictor of financial well-being, whereas education was not. Thus, we report the model excluding education in the current study.

[44]This result was verified by the Variance Inflation Factors (VIF) below 2.

Table 6. *Correlation results of all study variables*

Variable	2	3	4	5	6	7	8	9	10	11
19. Current financial stress	**-.68**	**-.65**	**-.38**	**-.41**	**-.50**	.09	**-.30**	**-.13**	**-.26**	-.05
20. Expected future financial security	—	**.60**	**.33**	**.38**	**.52**	-.08	**.23**	**.18**	**.30**	.01
21. Positive financial behaviors		—	**.23**	**.41**	**.38**	-.09	.07	**.20**	**.36**	**-.19**
22. Executive functioning			—	**.29**	**.28**	.02	**.29**	.09	.09	.01
23. Financial self-efficacy				—	**.23**	-.09	.06	**.20**	**.19**	**-.16**
24. Subjective socioeconomic status					—	-.03	**.25**	**.27**	**.43**	-.01
25. Gender						—	.02	.08	**-.11**	**.30**
26. Age							—	**-.15**	-.07	**.30**
27. Education								—	**.34**	**.17**
28. Effective income									—	**-.33**
29. Occupation										—

Note. Pearson's correlation coefficients among the continuous variables, point-biserial correlation coefficients between the categorical and the continuous variables, and Cramer's V among the categorical variables were calculated. Statistically significant correlations are printed in bold ($p < .05$).

Path analysis results

Because the interaction of executive functioning and financial self-efficacy did not have a significant contribution on positive financial behaviors (β = -.05, z = 1.33, p = .182) and financial well-being (current financial stress: β = -.00, z = 0.09, p = .930 and expected future financial security: β = .01, z = 0.25, p = .799), we excluded it. Hence, we only report the results for executive functioning and financial self-efficacy as separate predictors of financial well-being below.

Tables 7-10 report the standardized coefficients obtained from the path analysis when controlling for demographic variables (i.e., subjective socioeconomic status, age, effective income, and occupation).

Executive functioning and financial self-efficacy as predictors of current financial stress

Indirect effects on current financial stress. Results showed that there was no significant indirect relation found for executive functioning (β = -.03, z = 1.23, p = .218; see Table 7). Conversely, financial self-efficacy had a negative indirect relation with current financial stress via positive financial behaviors (β = -.14, z = 5.66, p < .001). A subsequent analysis of the component effects showed that financial self-efficacy had a positive association with positive financial behaviors (β = .29, z = 6.42, p < .001), which, in turn, had a negative relationship with current financial stress (β = -.49, z = 12.47, p < .001; see Table 8). These results provide no support for Hypothesis 1, but do support Hypothesis 2.

Direct effects on current financial stress. Results showed that both executive functioning (β = -.12, z = 3.18, p = .001) and financial self-efficacy (β = -.13, z = 3.60, p = <.001) had direct negative relations with current financial stress (see Table 7).

Total (indirect plus direct) effects on current financial stress. Results showed that executive functioning was a less strong predictor of current financial stress (β = -.15, z = 3.42, $p < .001$) than financial self-efficacy (β = -.27, z = 6.84, $p < .001$; see Table 7).

Among the demographic control variables, subjective socioeconomic status (β = -.29, z = 5.83, $p < .001$) and effective income (β = -.09, z = 2.09, $p = .037$) were negatively related to current financial stress (see Table 7). Regarding occupation, unemployed respondents reported less current financial stress than those who were employed full-time (β = -.15, z = 2.77, $p = .006$).

Table 7. *Indirect, direct, and total effects on current financial stress*

Variable	Standardized effects	z	95% CI	
			Lower	Upper
Indirect effects				
Executive functioning=>Positive financial behaviors=>Current financial stress	-.03	1.23	-0.07	0.02
Financial self-efficacy=>Positive financial behaviors=>Current financial stress	-.14***	5.66	-0.19	-0.09
Direct effects				
Executive functioning=>Current financial stress	-.12**	3.18	-0.20	-0.05
Financial self-efficacy=>Current financial stress	-.13***	3.60	-0.20	-0.06
Total effects				
Executive functioning=>Current financial stress	-.15***	3.42	-0.24	-0.07
Financial self-efficacy=>Current financial stress	-.27***	6.84	-0.35	-0.19
Subjective socioeconomic status=>Current financial stress	-.29***	5.83	-0.24	-0.12
Age=>Current financial stress	-.10	1.87	-0.01	0.00
Effective income=>Current financial stress	-.09*	2.09	-0.00	-0.00
Not employed for other reasons=>Current financial stress	-.03	0.54	-0.31	0.18
Employed part-time=>Current financial stress	-.05	1.20	-0.47	0.12
Self-employed=>Current financial stress	.05	1.13	-0.16	0.53
Unemployed=>Current financial stress	-.15**	2.77	-0.64	-0.11
(Semi-)retired=>Current financial stress	-.04	0.89	-0.36	0.13

Note. Employed full-time was the reference group. The indirect effects were estimated covariating the control variables. Confidence Intervals (CI) are computed with the Bootstrap percentiles method. Indirect and direct effects for the control variables are available upon request. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 8. *Component effects on current financial stress*

Variable	Standardized effects	z	95% CI	
			Lower	Upper
Executive functioning=>Positive financial behaviors	.05	1.24	-0.04	0.14
Positive financial behaviors=>Current financial stress	-.49***	12.47	-0.58	-0.42
Financial self-efficacy=>Positive financial behaviors	.29***	6.42	0.19	0.37

Note. Confidence Intervals (CI) are computed with the Bootstrap percentiles method. Component effects of the control variables are available upon request. *** $p < .001$.

Executive functioning and financial self-efficacy as predictors of expected future financial security

Indirect effects on expected future financial security. Results showed no significant indirect relation for executive functioning (β = .02, z = 1.23, p = .218; see Table 9). Conversely, financial self-efficacy had a positive indirect relation with expected future financial security via positive financial behaviors (β = .12, z = 5.22, p < .001). A subsequent analysis of the component effects showed that financial self-efficacy had a positive association with positive financial behaviors (β = .29, z = 6.42, p < .001), which, in turn, had a positive relationship with expected future financial security (β = .42, z = 9.51, p < .001; see Table 10). Again, these results provide no support for Hypothesis 1, but do support Hypothesis 2.

Direct effects on expected future financial security. Results showed that both executive functioning (β = .09, z = 2.27, p = .023) and financial self-efficacy (β = .12, z = 2.79, p = .005) had direct positive relations with expected future financial security (see Table 9).

Total (indirect plus direct) effects on expected future financial security. Results showed that executive functioning was a less strong predictor of expected future financial security (β = .11, z = 2.59, p = .010) than financial self-efficacy (β = .24, z = 5.81, p < .001; see Table 9).

Among the demographic control variables, subjective socioeconomic status (β = .32, z = 6.38, p < .001) and effective income (β = .11, z = 2.34, p = .019) were positively related to expected future financial security (see Table 9). Regarding occupation, unemployed

respondents reported more expected future financial security than those who were employed full-time ($\beta = .19$, $z = 3.62$, $p < .001$).

Table 9. *Indirect, direct, and total effects on expected future financial security*

Variable	Standardized effects	z	95% CI	
			Lower	Upper
Indirect effects				
Executive functioning=>Positive financial behaviors=>Expected future financial security	.02	1.23	-0.02	0.06
Financial self-efficacy=>Positive financial behaviors=>Expected future financial security	.12***	5.22	0.08	0.17
Direct effects				
Executive functioning=>Expected future financial security	.09*	2.27	0.01	0.16
Financial self-efficacy=>Expected future financial security	.12**	2.79	0.03	0.20
Total effects				
Executive functioning=>Expected future financial security	.11*	2.59	0.03	0.20
Financial self-efficacy=>Expected future financial security	.24***	5.81	0.16	0.32
Subjective socioeconomic status=>Expected future financial security	.32***	6.38	0.14	0.26
Age=>Expected future financial security	.00	0.08	-0.01	0.01
Effective income=>Expected future financial security	.11*	2.34	0.00	0.00
Not employed for other reasons=>Expected future financial security	-.04	0.77	-0.35	0.15
Employed part-time=>Expected future financial security	.02	0.45	-0.25	0.42
Self-employed=>Expected future financial security	-.07	1.29	-0.67	0.15
Unemployed=>Expected future financial security	.19***	3.62	0.24	0.73
(Semi-)retired=>Expected future financial security	-.01	0.30	-0.33	0.22

Note. Employed full-time were the reference groups. The indirect effects were estimated covariating the control variables. Confidence Intervals (CI) are computed with the Bootstrap percentiles method. Indirect and direct effects for the control variables are available upon request. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 10. *Component effects on expected future financial security*

Variable	Standardized effects	z	95% CI	
			Lower	Upper
Executive functioning=>Positive financial behaviors	.06	1.24	-0.04	0.14
Positive financial behaviors=>Expected future financial security	.42***	9.51	0.34	0.52
Financial self-efficacy=>Positive financial behaviors	.29***	6.42	0.19	0.37

Note. Confidence Intervals (CI) are computed with the Bootstrap percentiles method. Component effects of the control variables are available upon request. *** $p < .001$.

Discussion

In the present, preregistered, study using a representative sample of the UK population, we tested the hypotheses that both executive functioning (Hypothesis 1) and financial self-efficacy (Hypothesis 2) are associated with financial well-being (current financial stress and expected future financial security) via positive financial behaviors. We also hypothesized that financial self-efficacy moderated the indirect relation of executive functioning with financial well-being (Hypothesis 3a) and that executive functioning moderated the indirect relation of financial self-efficacy with financial well-being (Hypothesis 3b). Below, we discuss the main results, contributions, implications, and limitations of this study.

Summary of results and contributions

We found that executive functioning did not predict current financial stress and expected future financial security via positive financial behaviors, thereby not supporting Hypothesis 1. This finding corroborates some studies that showed no relation of executive functioning with neither positive financial behaviors nor financial well-being (Strömbäck et al., 2020), but contradicts others that showed positive relations (Drever et al., 2015).

We did obtain support for Hypothesis 2, as we found that financial self-efficacy predicted both current financial stress and expected future financial security via positive financial behaviors. This finding is in line with research that demonstrated a positive association of financial self-efficacy with positive financial behaviors (Farrell et al., 2016) and financial well-being (Sabri et al., 2020), respectively. Based on a comprehensive qualitative research, CFPB (2015) expressed that executive functioning and financial self-efficacy are important ingredients to better financial behaviors and, through these behaviors, support financial well-being. Our results add to the literature by empirically confirming this

path for financial self-efficacy, but not for executive functioning. In addition, Kempson et al. (2017) claimed that financial confidence plays an important role in predicting financial well-being. Our results add to the literature by showing that this is also the case for financial self-efficacy, which is a concept related but not similar to confidence.

It should be noted, however, that perceived self-efficacy was assessed within a financial context, whereas executive functioning was measured in relation to a broader, more general context. One might argue that the obtained difference in predictive power between self-efficacy and executive functioning reflects this difference in specificity, whereby more specific factors are stronger predictors of more specific behaviors (see e.g., Xiao, Tang, & Shim, 2008). Future research could address this issue by including a more specific assessment of executive functions.

Our results did not show that executive functioning and financial self-efficacy interacted to predict financial well-being, thus providing no support for Hypothesis 3a and Hypothesis 3b. Perhaps it reflects that the roles of these two factors in relation to both financial behavior and financial well-being are independent from each other. This suggestion may stimulate more research on this topic, for example, to assess whether the result depends on the socioeconomic context in question.

Furthermore, our results showed that financial self-efficacy and executive functioning were directly related to both current financial stress and expected future financial security. These results echo existing work that used an overall measure of financial well-being (Drever et al., 2015; Sabri et al., 2020) and extend it by showing that the direct relations applied to both dimensions of financial well-being.

In addition to the observed relationships discussed above, more exploratory analyses showed that subjective socioeconomic status, effective income, and unemployment were negatively related to current financial stress, but positively related to expected future

financial security. Intuitively, the higher the effective income of individuals, the easier they can meet their short-term financial obligations (e.g., rent, food) and save to meet their distant financial goals (e.g., house, car). As a result, they may experience less current financial stress and expect more future financial security. Similarly, the better off individuals perceive themselves in material terms compared to their peers, the less they will worry about their current financial state and the more they will work toward achieving a good future financial state. This may lead to less current financial stress and more expected future financial security. Although the result for unemployment might seem surprising, it probably reflects the fact that the UK offers a social security benefits system to unemployed individuals, which ensures that their living expenses are covered, leading them to experience less current financial stress and expect more future financial security.

Implications for financial practitioners and service providers

Overall, financial self-efficacy strongly contributes to financial well-being, and does so both directly and through positive financial behaviors. Executive functioning, on the other hand, has no indirect relation with financial well-being via positive financial behaviors, but only a moderate direct relation with financial well-being. Because financial self-efficacy and executive functioning have unequal associations with financial well-being, financial practitioners should take this into account when incorporating these factors in their interventions and practices. For example, it seems that executive functioning is not supportive of positive financial behaviors. Future research can expand our findings which were based on a UK sample by testing the studied relations within other socioeconomic and cultural contexts.

The fact that we found executive functioning to be a less strong predictor of financial well-being than financial self-efficacy may indicate that belief in one's decision-making

abilities is more germane to financial behavior and financial well-being than the abilities themselves. Research has indicated that it is easier to help individuals and families develop their beliefs in their capacities than their actual capacities (Dweck, 2006). Nevertheless, financial practitioners should be careful when focusing on beliefs, to prevent individuals from becoming overly self-efficacious. Earlier work has shown that individuals with strong beliefs but weak actual abilities display poor financial behaviors, such as skipping mortgage payments and taking informal debt (Balasubramnian & Sargent, 2020).

According to Bandura (1997), four sources contribute to one's self-efficacy: (a) performance accomplishments, (b) vicarious experience, (c) verbal persuasion, and (d) emotional arousal. Performance accomplishments regard how individuals and families learn from their successes and failures when engaging in a task or striving to meet a goal. For example, if individuals have tried to stick to a budget several times and failed to do so, they might quit performing this behavior. Financial practitioners can help these clients by creating a budget together with them and monitoring their behavior during the subsequent weeks. Financial service providers can also offer tools, such as budget apps in this case. Vicarious experience concerns how individuals and families replicate the behaviors of those around them, whom they view as their role models. Financial practitioners can facilitate their clients' financial behavior by posting about actual financial experiences and lessons learned via social media channels. And service providers can present their clients with actual anonymous client cases to help them understand the pros and cons of financial products and services.

Verbal persuasion refers to how individuals and families are motivated by others. Financial practitioners may wish to monitor their clients on a consistent basis to motivate them to continue performing a positive behavior that they have been lacking. Likewise, service providers can incentivize their clients to purchase financial products or services that are a better fit for their unique situation. Emotional arousal involves how individuals and

families' emotions influence how they perform a task or strive to achieve a goal. Financial practitioners can help their clients realize that they should avoid making financial decisions when they are emotional. Similarly, service providers should advise their clients to avoid purchasing financial products and services when they are emotional.

The above strategies will likely benefit individuals and families' financial self-efficacy and perhaps even more if practitioners and service providers work together. Said strategies are supported by prior research explaining that Bandura's sources are all effective ways to improve financial self-efficacy (Tharp, 2018).

Limitations and suggestions for future research

The present study comes with some limitations. First, as our study design has a correlational nature, we cannot confirm causal relationships. For instance, it could be that executive functions and financial self-efficacy increase financial well-being, but it could also be that the causal relationship is in the opposite direction. For example, previous research has indicated that financial scarcity impedes executive functions (Mani, Mullainathan, Sharif, & Zhao, 2013). Moreover, it could be that the relationships of executive functioning and financial efficacy with financial well-being are bi-directional and reinforce each other. For instance, high financial self-efficacy may lead to greater financial well-being, which, in turn, heightens financial self-efficacy, leading to a further increase in financial well-being. Future research could examine the possible causal relationships between executive functions, financial self-efficacy, and financial well-being by conducting, for example, longitudinal studies (e.g., Downward, Rasciute, & Kumar, 2020).

Second, in the present study executive functioning was assessed with a self-rating scale. In future studies, executive functioning might be assessed using a cognitive performance task, such as the hearts and flowers task, which measures working memory,

inhibitory control, and cognitive flexibility (Diamond, Barnett, Thomas, & Munro, 2007). Additionally, in the current research, we measured executive functions more generally, and not related to a specific domain. It would be interesting to examine whether the relationship between executive functions and financial well-being is stronger, when these cognitive abilities are measured specifically within the financial domain. For example, one could replace the item "It takes a lot of effort for me to remember things" with "It takes a lot of effort for me to remember things regarding my finances".

Third, the assessed positive financial behaviors were self-reported. Future research could assess actual financial behaviors, for example, by monitoring individuals' budgeting, spending, saving, and investing behaviors per week, month, or year (e.g., Ameriks, Caplin, & Leahy, 2004). Researchers, however, should be aware that collecting such data could be a challenge because (a) individuals may find it cumbersome to keep track of their financial habits, especially if they are not used to it, and (b) individuals may argue that this information is personal and confidential and, therefore, not participate in the study.

Conclusions

Financial well-being has positive implications for individuals, families, organizations, and the society and these implications are not limited to the financial realm. Therefore, financial practitioners and service providers, among others, must know what factors determine financial well-being, to develop strategies to help individuals and families achieve and maintain it. Our study contributes to the current literature by providing new insights on how executive functioning and financial self-efficacy predict subjective financial well-being.

Practitioners are recommended to assign an important role to financial self-efficacy in their interventions and practices (insofar this has not been done yet), as it seems to be a key factor to better both financial behaviors and financial well-being. Given the moderate

contribution of executive functioning, practitioners are advised to draw attention to this factor if they notice that their clients lack higher-order thinking. Service providers are encouraged to collaborate with practitioners and offer a supporting role in this process, as described earlier. We suggest testing the effectiveness of these potential avenues for interventions and practices as soon as possible. This will enable practitioners to continue improving their strategies, to ensure that individuals and families enjoy the highest financial well-being possible.

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