Decomposition of the Financial Capability Construct: A Structural Model of Debt Knowledge, Skills, Confidence, Attitudes, and Behavior

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Based on a nationally representative sample of adult Poles (N = 1,004), we examined structural relationships between financial knowledge, skills, confidence, attitudes, and behavior in debt-domain. We found that financial confidence—at least regarding debt-related issues—is tied to debt attitudes and behavior beyond the extent to which the attitudes and behaviors are linked to objective debt knowledge. Moreover, the relationship between objective knowledge and confidence turned out to be insignificant in our study. These findings suggest that confidence should be used as a separate marker of financial capability. Having established that skills correlate with behavior and attitudes differently than objective knowledge, we argue also to include them separately in financial capability measurements.

Keywords: debt literacy, financial attitudes, financial behavior, financial confidence, financial knowledge, financial literacy, financial skills

In consumer finance domain, financial capability is defined as a combination of objective financial literacy, subjective financial literacy, desirable financial behaviors, and perceived financial capability (Xiao, Chen, & Chen, 2014; Xiao & O'Neill, 2018; Xiao & Porto, 2017). Previous studies, however, provided a limited insight into both the morphology (i.e., the internal structure) of the financial capability and the interlinks within this complex construct. Empirical research very rarely discerned the ability dimension of financial capability from its knowledge counterpart. Moreover, many studies use the term financial capability interchangeably with the term financial literacy (Xiao & Porto, 2017) or equate financial literacy with financial knowledge (see Huston, 2010 for details). Some relationships within the financial capability construct have been already tested. Atlas, Lu, Micu, and Porto (2019), Moreland (2018), and Seay, Preece, and Lec (2017) probed the relationship between financial knowledge and financial behavior, while others established the connection between financial attitudes and financial behavior (e.g., Chien & Devaney, 2001; Haultain, Kemp, & Chernyshenko, 2010; Hayhoe, Leach, & Turner, 1999).

The research, however, seldom addressed the link between financial knowledge and attitudes, as well as the way attitudes mediate the link between financial knowledge (or skills) and behavior. Finally, the research recognizing the role of financial confidence (i.e., self-assessed, or subjective, financial knowledge) in the formation of financial attitudes and behaviors is still emerging (Allgood & Walstad, 2016; Anderson, Baker, & Robinson, 2017; Fan & Chatterjee, 2017; O'Connor, 2019; Parker, de Bruin, Yoong, & Willis, 2012; Rothwell & Wu, 2019). As a result, despite considerable progress in the financial capability literature since the Great Recession, the picture remains scattered and incomplete.

In this article we simultaneously examine the key dimensions of financial capability identified by the literature. We obtain a more complete picture of financial capability

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and establish how its components, especially in the debt domain—knowledge, skills, confidence, attitudes, and behavior—are interrelated. Based on the results, we provide policy recommendations for the financial capability promotion.

We present at least four original contributions to the literature. First, we isolate key elements of the overall financial capability construct and gauge the associations between its constituent components. Second, we use a novel and tailor-made data set from the largest country in the Central and Eastern European region—Poland. Third, we focus on debt capability—a less-studied aspect of the overall financial capability. Decisions in this domain are highly relevant and, if misguided, generate significant impact on well-being of debt holders (Białowolski, Węziak-Białowolska, & VanderWeele, 2019). Moreover, as shown by recent meta-analyses (Kaiser & Menkhoff, 2017; Miller, Reichelstein, Salas, & Zia, 2015), debt-related decisions, unlike other decisions in financial domain, may be less prone to external (e.g., educational) stimuli. Four, we apply novel instruments to measure debt knowledge and skills. These instruments are more comprehensive than the state-of-the-art measures used by Disney and Gathergood (2012), Lusardi and Tufano (2015), or van Ooijen and van Rooij (2014).

Literature Review

Conceptual Definition of Financial Capability

Although financial capability and financial literacy are often used interchangeably, the former is a broader concept that includes the latter (Xiao & O'Neill, 2016). Despite gradual unification of its measurement, financial literacy is still missing a standardized conceptual definition and operationalization (see, e.g., Hung, Parker, & Yoong, 2009; Huston, 2010; Knoll & Houts, 2012; Remund, 2010; Schmeiser & Seligman, 2013; Warmath & Zimmerman, 2019, for their discussion on the topic). Within the set of standard definitions, an overwhelming majority of theoretical research perceives financial literacy as a combination of knowledge and skills (an ability to apply knowledge), with the knowledge dimension being the core of the construct (Hung et al., 2009; Huston, 2010; Remund, 2010; Warmath & Zimmerman, 2019; Xiao & Porto, 2017).

The literature also identifies another constituent factor of financial literacy—financial confidence. Although some works (e.g., Huston, 2010; Remund, 2010) define its meaning similarly to the concept of self-efficacy developed by Bandura (1986, 1997)—or use financial self-efficacy explicitly as a dimension of financial literacy (Warmath & Zimmerman, 2019)—the most widespread is the approach in which financial confidence is treated as a respondent's self-assessment of her knowledge (Allgood & Walstad, 2016; Anderson et al., 2017; Bucher-Koenen, Alessie, Lusardi, & van Rooij, 2016; Chung & Park, 2019; Gentile, Linciano, & Soccorso, 2016; O'Connor, 2019; Parker et al., 2012).

It has been shown recently that financial confidence defined this way—that is, as subjective financial knowledge—conveys additional information that is above and beyond objectively measured financial knowledge (Allgood & Walstad, 2016; Anderson et al., 2017; Chung & Park, 2019; O'Connor, 2019; Parker et al., 2012; Rothwell & Wu, 2019; Shim, Barber, Card, Xiao, & Serido, 2010). Unlike actual knowledge, which is a cognitive construct that can be measured objectively through a test, subjective knowledge has a more affective nature and is usually measured via a single item addressing a respondent's perception—on a Likert scale—of her knowledge level on (or familiarity with) financial issues (Allgood & Walstad, 2016; Lusardi & Tufano, 2015; Shim et al., 2010).

The notion of financial capability augments financial literacy (defined as a combination of financial knowledge, skills, and confidence) by another dimension—desirable financial behaviors. This broader concept has been used in the well-known Organisation for Economic Co-operation and Development studies (OECD, 2016) with addition of another formative factor of consumers' financial capability: their financial attitudes.

Despite theoretical recognition of the dimensions of financial capability, empirical literature usually focuses on only some of these dimensions. With the exceptions of Huston (2012) and Warmath and Zimmerman (2019), empirical studies did not provide a clear-cut distinction between knowledge and skills. Instruments measuring financial literacy as the main input of financial capability are often either purely knowledge-oriented (Fernandes et al., 2014; Lyons, Rachlis, & Scherpf, 2007) or skills-oriented (French & McKillop, 2016). Even if attempts to separate skills from knowledge are made, numerous studies equate financial skills with numerical abilities (Almenberg

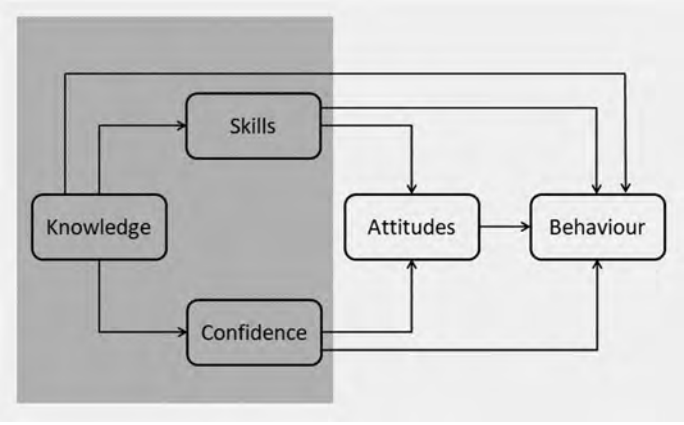
& Dreber, 2015; Bannier & Neubert, 2016; Bannier & Schwarz, 2018; Gerardi, Goette, & Meier, 2013; Lusardi & Mitchell, 2008) or provide assessment of financial literacy based on objective (e.g., Disney, Gathergood, & Weber, 2015) or subjective (Sansone, Rossi, & Fornero, 2018) knowledge only—despite the two dimensions bearing different informational content. To address those issues, we identify five most discussed constituent components of financial capability and establish the links within the financial capability construct.

The Conceptual Model and Hypotheses

In this study, we assumed that the financial capability construct consists of five components—knowledge, skills, confidence, attitudes, and behavior—which are closely interlinked (as shown in Figure 1). Our approach combines conceptual frameworks of Hung et al. (2009) and Huston (2010) with the analytical approach, based on the structural equation models, proposed by Shim et al. (2010) and Xiao, Tang, Serido, and Shim (2011), in which financial attitudes are considered an intermediary between knowledge and behavior. We additionally assumed that attitudes mediate the link between skills and behavior, as well as the link between confidence and behavior.

Beyond the standard set of controls, we added to our conceptual model two little-studied variables suggested by previous researchers as likely factors explaining the heterogeneity of financial literacy in the population: the assignment of financial decision making in the household (denoted as "Household CFO") and gender of the economics teacher of those respondents who were taught economics.

Figure 1. The conceptual model.



Hsu (2016), Ward and Lynch (2019), and Białowolski, Cwynar, and Węziak-Białowolska (2020) showed that the development of financial literacy within a couple may be explained by the division of financial decision making power between relationship partners. Ward and Lynch (2019) additionally established that the intra-household division of financial decision making power affects not only the cognitive components of financial literacy (i.e., knowledge probed with their 13-question quiz), but also the behavioral component (i.e., decision making quality and related financial outcomes). Evidence that the division of intra-household decision making power (including the financial domain) has a significant influence on financial behavior of relationship partners was also documented by other researchers, including Babiarz, Robb, and Woodyard (2012), Friedberg and Webb (2006) and Lyons, Neelakantan, Fava, and Scherpf (2007).

Butters, Asarta, and Mccoy (2012) posit that men teach economics more often than women and that therefore, this imposes particular role models on their students. Although Butters et al. (2012) do not refer to specific elements of financial capability construct, we hypothesized that both these additional variables included in our conceptual model—"Household CFO" and "Gender of economics teacher"—may influence all the components of broadly defined financial capability: knowledge, skills, confidence, attitudes, and behavior.

The model tested in this article was already probed in a reduced form by Białowolski, Cwynar, Cwynar, and Węziak-Białowolska (2020). Their approach was, however, limited to the relationships between debt knowledge, debt skills, and debt attitudes in the context of gender differences.

Previous research, focused on formal development of financial capability measurement models, took effort to explore the links between its constituent factors. Potrich, Vieira, and Mendes-Da-Silva (2016) followed the conceptual definition proposed by OECD/INFE (2016) and assumed that financial capability consists of knowledge, attitudes, and behavior. Yet, neither skills nor confidence were distinguished and included in their study. Using structural equation modeling (SEM) and a random sample of university students in Brazil, Potrich et al. (2016) found that both financial knowledge and financial attitudes have a positive impact on financial behavior.

The Link Between Financial Knowledge and Skills

Except the recent study of Warmath and Zimmerman (2019), who confirmed intuitive correlation between financial knowledge and skills, the literature does not provide a clear distinction between the two. Based on the assumption that skills are critical for financial literacy as they relate to the ability to process numbers, previous research has already used numeracy (numerical skills) as a component of financial literacy, labeling it as "basic financial literacy" (Bannier & Neubert, 2016; Bannier & Schwarz, 2018; Lusardi & Mitchell, 2007, 2008). In these studies, factual questions probing respondents' knowledge, rather than their skills, were labeled as "advanced financial literacy." Although these studies combine numeracy ("basic financial literacy") with knowledge ("advanced financial literacy") into an overall financial literacy index, they do not attempt to study the link between them.

There are studies in which the two have been disentangled. They document a strong positive correlation between knowledge and numeracy (Banks & Oldfield, 2007; Cole, Sampson, & Zia, 2011). Further, using a sample representative for the Swedish population, Skagerlund, Lind, Strömbäck, Tinghög, and Västfjäll (2018) showed that numeracy is a strong predictor of financial literacy measured with four questions selected from well-recognized "Big Five" instrument (see, for instance, Hastings, Madrian, & Skimmyhorn, 2013). Grohmann, Kouwenberg, and Menkhoff (2015), based on direct interviews conducted on the streets of Bangkok, found that numeracy is a mediator between financial socialization that took place in the childhood and later life financial literacy measured via the "Big Three" test (Lusardi & Mitchell, 2006)—a well-known three-question quiz including two more knowledge-oriented queries and one tilted more towards the number-processing skills.

The Link Between Financial Knowledge and Confidence

In their influential meta-analytical study on the link between objective and subjective knowledge in consumer-related domains, Carlson, Vincent, Hardesty, and Bearden (2009, p. 865) write that "what an individual believes s/he knows should be some function of what s/he actually does know." Hence, an intuitive expectation is that subjective financial knowledge or, alternatively, financial confidence, correlates positively with objective financial knowledge. The empirical literature identifies from low (e.g., Henager & Cude, 2019), through modest (e.g., Parker et al., 2012) to significantly positive (see, e.g., Lusardi & Mitchell, 2017 in the United States; Disney & Gathergood, 2011 in the United Kingdom; Sekita, 2011 in Japan) relationship between financial knowledge and financial confidence. However, some studies have found the relationship to be insignificant (O'Connor, 2019). It has been evidenced that the link between financial knowledge and confidence may depend on the way in which knowledge test scores are processed (Cwynar, Cwynar, & Wais, 2019) as well as on the individual characteristics of respondents (Agnew & Szykman, 2005; Gathergood & Disney, 2011).

The Link Between Financial Attitudes and Other Components of Financial Capability

The literature on the link between financial attitudes and financial knowledge, skills, or confidence is scarce. Shim et al. (2010), as well as Xiao et al. (2011), show that financial knowledge and confidence predict financial attitude (more specifically, higher levels of knowledge (and confidence) are significantly related to a more positive attitude towards desired financial behaviors). Almenberg, Lusardi, Säve-Söderbergh, and Vestman (2018) and Lachance (2012) indicate that pro-debt attitudes are positively related to knowledge about credit. However, the results are not always unequivocal. Beale and Cude (2017), for example, find that financial knowledge is not significantly associated with attitudes towards debt.

The Link Between Financial Attitudes and Behavior

Livingstone and Lunt (1992) confirm the significance of attitudes (particularly pro-debt attitude) for debt and debt repayments. Higher installment debt is observed among individuals with more favorable general attitude towards debt (Chien & Devaney, 2001). It can be a consequence of higher debt utility (Haultain et al., 2010) or feeling comfortable with debt (Almenberg et al., 2018). Less pro-debt individuals are more likely to exhibit sustainable (i.e., healthy) debt behavior (Goedde-Menke, Erner, & Oberste, 2017) and have higher credit scores (Walters et al., 2016). Xiao et al. (2011) establish that students have a stronger intention to engage in healthy financial behaviors if they have favorable attitudes towards such behaviors. In addition, Hayhoe, Leach, and Turner (1999) find that both affective and cognitive credit attitudes are significant predictors of students having four or more credit cards.

The Link Between Financial Behavior and Other Components of Financial Capability

A significant and positive link between financial knowledge and desired (healthy) financial behaviors is well-established. Although the direction of causality is still disputable, there is a bulk of individual-level evidence confirming positive association between the knowledge-related aspects of financial literacy and a wide range of financial behaviors (see Stolper & Walter, 2017, for a comprehensive overview and discussion, including discussion on the issue of causality). Those behaviors are linked to both objective and subjective financial knowledge and, additionally, the relationship is valid both in the short and in the long-run (Henager & Cude, 2016).

Additionally, vast empirical literature corroborates significant and positive relationship between numerical abilities—particularly important for developing high financial skills—and desired financial behaviors (see, for instance, Almenberg & Widmark, 2011; Banks & Oldfield, 2007; Soll, Keeney, & Larrick, 2013; Roa, Garrón, & Barboza, 2019). These findings are consistent with the results of previous researchers both inside and outside the consumer finance domain. They showed that numerical abilities are significantly related to the behavior of individuals, their decision making and to the outcomes of these decisions (e.g., Agarwal & Mazumder, 2013; McArdle, Smith, & Willis, 2009; Peters et al., 2006).

On a more detailed level, a significant relationship has been also established between financial literacy—measured with a knowledge test, skills test, or with a test comprising both knowledge-oriented and skill-oriented questions—and debt behavior. For instance, Moore (2003) shows that financial ignorance is associated with higher costs in general and, in particular, excessive costs of debt-related transactions among less financially capable individuals are observed. Gerardi et al. (2010, 2013) report a strong and negative relationship between the numerical aspect of financial literacy and the likelihood of mortgage delinquency and default. French and McKillop (2016) find that basic money management skills are negatively related to the propensity to borrow from many different lenders at the same time, which is deemed to be imprudent financial behavior, as well as to the likelihood of reporting high debt-to-income ratios. The findings of Klapper, Lusardi, and Panos (2012) suggest that those who score higher on financial literacy tests are less likely to borrow informally. Debt literacy studies confirm these links too. Disney and Gathergood (2011) show that debt-illiterate consumers borrow at a higher cost, report lower net worth, and tend to face difficulties in paying off their debt, falling into arrears more frequently. The excessive cost of borrowing among debt-illiterate individuals is confirmed by Lusardi and Tufano (2015), who also document excessive debt loads and problems with debt position assessment among less debt-literate respondents.

Previous studies also suggest that the self-assessed financial knowledge (equated with financial confidence in this article) may be at least as important as actual (test-based) knowledge in shaping financial behaviors (Allgood & Walstad, 2016). Financial confidence is more important in preventing risky credit behaviors than objective financial knowledge (Xiao et al., 2011). The confidence is also positively related to the incidence of financial planning for retirement, that is, unambiguously prudent financial behavior, and to minimizing the total amount of fees in a hypothetical investment task (Parker et al., 2012). Using a sample composed exclusively of LinkedIn users, Anderson et al. (2017) discover that financial confidence fosters precautionary savings and retirement planning more than actual financial literacy. These findings proving dissimilarity of financial confidence from objective financial knowledge, have been confirmed in the most recent studies (Chung & Park, 2019; O'Connor, 2019; Rothwell & Wu, 2019).

Method

Data and Participants

We fielded a questionnaire-based survey on debt knowledge, skills, confidence, attitudes, and behavior during the period of 7–22 November 2017. The data were collected from a nationally representative sample of 1,004 Poles aged 18 or older through computer-assisted telephone interviewing. We partnered with a professional market and opinion research agency, DRB Polonia, to conduct the survey. The sample was controlled by cross-section quotas for three demographic variables—sex, age, and income (see Table 1 for details of the variables)—in order to ensure its representativeness.

Measurement Instruments

Our measurement approach was distinct in two respects. First, in our study, we clearly separated financial knowledge from financial skills. Second, we concentrated

TABLE 1. Debt Knowledge, Skills, and Confidence in Terms of the Sample Composition

		Sample Composition	Skills (Max 4)	Knowledge (Max 12)	Confidence (1 = very low, 5 = very high)
Entire sample			1.68	6.62	3.20
Gender	Men	47.9%	1.70	**6.72**	3.17
	Women	52.1%	1.65	**6.51**	3.22
Age	Below 25	9.4%	1.83	**7.05**	**3.25**
	25–34	19.4%	1.65	**6.55**	**3.11**
	35–44	20.4%	1.60	**6.66**	**2.93**
	45–54	18.5%	1.68	**6.42**	**3.24**
	55–64	16.9%	1.67	**6.72**	**3.22**
	65+	15.3%	1.75	**6.51**	**3.52**
Gender of economics teacher	Female	28.4%	**1.84**	**6.56**	**3.12**
	Male	16.7%	**1.65**	**7.07**	**3.04**
	Female and male equally	14.6%	**1.69**	**6.88**	**2.98**
	I have never learned economics	40.2%	**1.57**	**6.37**	**3.39**
Household CFO	Me	35.3%	**1.75**	6.62	**3.22**
	My partner	9.3%	**1.85**	6.62	**3.23**
	Me and my partner equally	51.0%	**1.59**	6.57	**3.15**
	Someone else	4.5%	**1.80**	7.04	**3.55**
Monthly income (per person)	Up to 1,400 PLN	17.0%	**1.84**	6.85	**3.43**
	1,401—2,000 PLN	36.7%	**1.59**	6.60	**3.24**
	2,001—3,000 PLN	31.7%	**1.39**	6.52	**3.13**
	Over 3,000 PLN	14.6%	**2.34**	6.61	**2.95**

Note. PLN = symbol of Polish currency (Polish zloty). Significant differences within the given socio-economic characteristics are in bold.

on debt-related knowledge and skills. Yet, the instruments measuring each of these two components of financial literacy included a number of items not related directly to credit, debt, or borrowing. Hence, it should be borne in mind when interpreting our results, that essentially, adopted instruments reflect consumers' financial capability in debt-related domains although we discuss them in a broader context of financial capability in general.

Knowledge was measured with 12 factual "true/false" questions (1 = true, 0 = false) probing both familiarity with and understanding of debt-related concepts, institutions, and products. To measure debt skills, we used four single-choice test questions similar to those applied by Lusardi and Tufano (2015), that is, questions utilizing numbers but solvable with simple reasoning and without using a calculator (1 = correct answer; 0 = incorrect answer). Development of instruments for measuring debt knowledge and skills has been demonstrated in detail in Białowolski et al. (2020).[1]

Debt-related confidence was derived from the survey item that inquired: "On a scale of one to five, where one means very low and five means very high, how would you assess your debt knowledge?" This question preceded the objective diagnosis of debt knowledge and skills.

[1] In Białowolski et al. (2020) the instrument measuring skills consists of five items. In this study, the number of items has been reduced to four. The relationship between debt knowledge and debt skills proved to be statistically significant and positive.

We adopted the scale of debt attitudes from Białowolski et al. (2020). Using latent class analysis, they distinguished five classes of attitudes with different profiles. Financial behavior was also determined with the use of latent class analysis (Białowolski, 2016, 2019; Muthén, Shedden, & Spisic, 1999; Vermunt & Magidson, 2002). We combined the frequency of credit use with the objectives for debt and the value of monthly installments to determine debt possession patterns. Based on the Bayesian Information Criterion (BIC) criterion, we selected an optimal model, which proved to be a six latent class solution. The individuals belonged either to one of the five clusters of credit users or the remaining cluster of respondents not active on the credit market.

Structural Model

In order to capture the relationships depicted in Figure 1, SEM was employed. This approach allowed for simultaneous estimation with maximum likelihood of the set of interrelated equations. Due to complex relationships between variables, simultaneous estimation was required to capture specified relationships without bias. We have applied generalized SEM framework available in Stata 15. Generalized framework for response variables implied that we could fit linear regression and multinomial logistic regression models in a single estimation. The set of simultaneous equations can be formally presented in the following form:

$$\begin{aligned}
objknow_i &= \alpha_{0,1} + \beta_{1,1} \cdot gender_i + \beta_{2,1} \cdot inc_i + \beta_{3,1} \cdot age_i \\
&\quad + \beta_{4,1} \cdot teacher_i + \beta_{5,1} \cdot findec_i + \varepsilon_{1,i} \\
skills_i &= \alpha_{0,2} + \alpha_{1,2} \cdot objknow_i + \beta_{1,2} \cdot gender_i + \beta_{2,2} \\
&\quad \cdot inc_i + \beta_{3,2} \cdot age_i + \beta_{4,2} \cdot teacher_i + \beta_{5,2} \\
&\quad \cdot findec_i + \varepsilon_{2,i} \\
confidence_i &= \alpha_{0,3} + \alpha_{1,3} \cdot objknow_i + \beta_{1,3} \cdot gender_i + \beta_{2,3} \\
&\quad \cdot inc_i + \beta_{3,3} \cdot age_i + \beta_{4,3} \cdot teacher_i + \beta_{5,3} \\
&\quad \cdot findec_i + \varepsilon_{3,i} \\
attitude_i &= m\text{logit}\begin{pmatrix} \alpha_{0,4} + \alpha_{1,4} \cdot objknow_i + \alpha_{2,4} \cdot skills_i + \\ \alpha_{3,4} \cdot confidence_i + \beta_{1,4} \cdot gender_i + \\ + \beta_{2,4} \cdot inc_i + \beta_{3,4} \cdot age_i + \beta_{4,4} \cdot teacher_i \\ + \beta_{5,4} \cdot findec_i \end{pmatrix} \\
&\quad + \varepsilon_{4,i} \\
behavior_i &= m\text{logit}\begin{pmatrix} \alpha_{0,5} + \alpha_{1,5} \cdot objknow_i + \alpha_{2,5} \cdot skills_i + \\ \alpha_{3,5} \cdot confidence_i + \alpha_{4,5} \cdot attitude_i + \\ + \beta_{1,5} \cdot gender_i + \beta_{2,5} \cdot inc_i + \beta_{3,5} \cdot age_i \\ + \beta_{4,5} \cdot teacher_i + \beta_{5,5} \cdot findec_i \end{pmatrix} \\
&\quad + \varepsilon_{5,i}
\end{aligned}$$

where $objknow_i$ represents the *i-th* respondent debt knowledge, $skills_i$ her debt skills, $confidence_i$ her level of debt-related confidence, $attitude_i$ is an indicator variable for one of the five adopted debt attitudes, and $behavior_i$ demonstrates the way a consumer behaves with respect to debt. The set of control variables used in the analysis covers gender, income level (*inc*), age, gender of the economics teacher (*teacher*) and the person responsible for financial decision making (*findec*). depict error for *i-th* respondent in equation n.

Results

Descriptive Statistics and Latent Class Analysis Results

Table 1 reports the descriptive statistics for the full sample. The mean objective debt knowledge of the surveyed participants on a scale from 0 to 12 equals 6.62. The mean debt skills, measured on a scale from 0 to 4, equals 1.63. The mean debt-related confidence on a scale from 1 to 5 equals 3.20 for the full sample.

Adopted classes of debt attitudes were associated with the following patterns (Białowolski et al., 2020): (a) overall pro-debt, (b) overall neutral, (c) anti-debt but participatory, (d) neutral and withdrawn, and (e) overall anti-debt. "Overall neutral" is the smallest class (11.5% of respondents). However, this class is also the most consolidated (the most homogenous) in terms of debt attitudes. On the other hand, the class "Overall anti-debt" is the largest one as it includes 32.4% of respondents. For comparison, the "Overall pro-debt" class is only half as much (14.5%). Two classes with the most diverse attitudes—"Anti-debt but participatory" and "Neutral and withdrawn"—are of similar size (19.1% and 22.4%, respectively).

We distinguished six classes of debt behavior: (a) multiple-debt and multiple-purpose borrowers, (b) single-debt and renovation borrowers, (c) single-debt and mortgage borrowers, (d) non-durable borrowers with an increased income

burden, (e) durable borrowers with an increased income burden, (f) non-borrowers (for detailed analysis on identification of debt patterns please refer to Białowolski, Cwynar, and Cwynar (2019). Almost two-thirds of all surveyed respondents reported that they were free from any debts. The remaining five debt behavior classes were considerably smaller—from 4.1% of respondents included in the class of "Multiple-debt and multiple-purpose borrowers" to 10.3% of respondents included in the "Durable borrowers with an increased income burden" class.

Relations Identified Within the Financial Capability Construct

Table 2 presents the links between different dimensions of financial capability as defined within our framework presented on Figure 1.

One of the most surprising findings of our study relates to the insignificant link between debt knowledge and debt-related confidence (or, alternatively, between objective and subjective debt knowledge).

With respect to the attitudes, objective debt knowledge significantly increases respondent's chances of being included in the "Neutral and withdrawn" class but reduces the chances of being in the "Overall neutral" class. On the other hand, debt skills significantly impact (either positively or negatively) the chances of being included in all but the "Overall anti-debt" class. Higher skills are very strongly associated with "Overall pro-debt" attitudes. Interestingly, the link between skills and the chances of being included in a class with predominantly neutral attitudes is negative. It indicates that neutral attitudes represent a lack of commitment to the financial affairs rather than actual neutrality. Higher debt-related confidence increases the chances of being included in the classes "Overall pro-debt," "Overall neutral," and "Neutral and withdrawn."

Respondents with attitudes described as "Overall pro-debt" had a higher probability of falling into three debt behavior classes ("Multiple-debt and multiple-purpose borrowers," "Single-debt and renovation borrowers," and "Durable borrowers with an increased income burden") than their counterparts with "Overall anti-debt" attitude. Those who held attitudes described as "Overall neutral" had higher chances of being classified as "Durable borrowers with an increased income burden" but had a significantly lower probability of belonging to groups of "Single-debt and mortgage borrowers," "Single debt and renovation," as well as "Non-durable borrowers with an increased income burden."

We found that objective debt knowledge is insignificant in terms of increasing or decreasing a respondent's chances of being included in any of the debt behavior classes distinguished in our study. The only marginally significant link was observed for "non-borrowers," namely an increase in the level of knowledge by one point on our 0–12 scale, was associated with higher probability of belonging to the "Non-borrowers" class by 1.54% points. Similar conclusion was noted for skills, where a one-point increase in the score on 0–4 scale translated into a 4.3% point higher probability of being in the "Non borrowers" class. Confidence, in turn, was found to significantly increase a respondent's chances of being included in any of the active debtor classes, except for one, namely the "Durable borrowers with increased income burden."

Discussion

The Link Between Objective Debt Knowledge and Debt Skills

We found that individuals more knowledgeable in debt domain appear to be more skilled in terms of running debt-related calculations. The measure of debt skills applied in our study, although explicitly embedded in the financial domain, was designed to capture abilities essential for numeracy (i.e., processing numerical concepts). Given this, our finding on the link between debt knowledge and debt skills may be interpreted as consistent with the results of Banks and Oldfield (2007) and Cole et al. (2011) who evidenced significant and positive relationship between financial knowledge and numeracy. It also suggests that the core and objectively verifiable financial capabilities—reflected in debt knowledge and skills—have strong, and probably common, cognitive underpinnings.

The Link Between Objective Debt Knowledge and Debt-Related Confidence

Our study clearly suggests that subjective debt knowledge (i.e., debt-related confidence) should not be treated as a proxy for objective debt knowledge. In line with this claim, the link between test-based debt knowledge and debt-related confidence turned out to be insignificant. Such finding closely matches the recent result of O'Connor (2019).

TABLE 2. Results of the Structural Relationships Depicted in Figure 1

				Attitudes (Marginal Effects in pp.)					Class of Credit Users (Marginal Effects in pp.)					
		Skills (Lin. Reg.)	**Confidence (Lin. Reg.)**	**Overall pro-debt**	**Overall neutral**	**Pessimistic but undiscouraged**	**Neutral and discouraged**	**Overall anti-debt**	**multiple-debt multiple purpose**	**single-debt and renovation**	**single-debt mortgage**	**non-durable with increased burden**	**durable with increased burden**	**non-borrowers**
Skills		–	–	6.26***	-3.38***	3.23**	-6.75***	0.64	-0.99	-0.46	-1.12	-1.11	-0.62	4.3***
Knowledge		0.08***	-.01	0.46	-1.91***	-0.05	1.94**	-0.44	-0.07	-0.54	-0.18	-0.23	-0.53	1.54*
Confidence		–	–	3.77***	1.39	-1.25	3.38**	-7.29***	2.2***	2.42**	3.19***	1.77*	0.37	-9.94***
Attitudes (ref. class overall anti-debt)	overall pro-debt	–	–	–	–	–	–		5.75**	11.09***	-0.38	-0.55	9.94***	-25.85***
	overall neutral	–	–	–	–	–	–		1.54	-4.85***	-4.47***	-5.65***	6.61*	6.81
	pessimistic but undiscouraged	–	–	–	–	–	–		1.75	0.69	-0.35	0.08	7.79***	-9.96**
	neutral and discouraged	–	–	–	–	–	–		0.97	3	-0.31	-0.55	2.29	-5.4

Note. Following the specification of the structural relationships between different dimensions of debt literacy, depicted coefficients are either linear regression estimates (skills ? knowledge; confidence ? knowledge) or marginal effects estimates (attitudes ? skills, knowledge, confidence; behaviors ? skills, knowledge, confidence, attitudes).

* Significant at 0.1 level, ** significant at 0.05 level, *** significant at 0.01 level.

More broadly, the effect is also consistent with the meta-analytical results of Carlson et al. (2009) who showed that the overall correlation between objective knowledge and subjective knowledge in consumer research is rather weak. The divergence between objective and subjective knowledge may be attributed to psychological biases (Kahneman, 2011), including self-evaluation bias, which are likely to result in miscalibration of one's knowledge and, subsequently, lead to either overconfidence or underconfidence (Alba & Hutchinson, 2000; Carlson et al., 2009; DellaVigna & Malmendier, 2006; Grubb & Osborne, 2015). Previous studies (e.g., Credit Information Bureau and The Kronenberg Foundation, 2014 in Poland; Lusardi & Mitchell, 2011; van Rooij, Lusardi, & Alessie, 2011 in the United States) suggest that financial confidence—compared with objective financial knowledge—is relatively high. This finding has been confirmed by our data pointing to a possible debt-related overconfidence in the Polish population.

The Link Between Debt Attitudes and Other Components of Debt Capability

We found two differences in the way objective debt knowledge and skills were related to debt attitudes (see Białowolski et al., 2020, for details). First, skills turned out to be a significant factor for the odds of being included in four (out of total five) classes of debt attitudes (while knowledge was significant only for two classes). Second, for one of these five classes the sign of the relation between objective debt knowledge and debt attitudes was opposite to the sign of the relation between debt skills and debt attitudes. Such results support the view that skills should be disentangled from objective debt knowledge when measuring debt-related capabilities due to additional information content skills may convey.

The same differences between objective debt knowledge and debt-related confidence were also found in their linkage to debt attitudes. This supports the claim that the latter should not be treated as a mere proxy for the former. Instead, the confidence may explain debt attitudes above and beyond the explanations given by objective measure of the debt knowledge.

The Link Between Debt Attitudes and Debt Behavior

We found that debt attitudes matter for debt behaviors. Specifically, those respondents who demonstrate overall neutral attitudes have significantly lower chances of being included in majority of debt behavior classes, regardless of the extent to which the average behavior in these classes is prudent (imprudent) or risky (safe). One may suspect that the neutral attitude implies general disconnection between those consumers and the credit market. Likely, due to lack of interaction, consumers revealing neutral attitudes had no chance to develop any attitude that would stimulate credit uptake decision. However, consumers with overall pro-debt attitudes are significantly and positively more likely to be included in the majority of debt behavior classes.

The Link Between Debt Behavior and Other Components of Debt Capability

In our study we strived to decouple debt skills from objective debt knowledge. Our results confirm that only debt skills relate to debt behavior. The different connections of knowledge and skills with financial behavior is similar to the results reported by Gerardi et al. (2010) who found significant relationship between numeracy and delinquency, but not between financial knowledge and delinquency.

We also decoupled objective debt knowledge from respondents' self-assessments of the knowledge (i.e., from confidence). As a result, we demonstrated that only the latter significantly relates to debt behavior. In a nutshell, the confidence significantly increases probability of falling into any of the debt behavior classes that consist of (more or less risky) debtors (while objective debt knowledge is insignificant for the chances of being included in any of these classes). Unlike objective debt knowledge, debt-related confidence seems to facilitate the borrowing decision and prompt an action that results in contracting a debt. This may be because confidence reduces hesitation—the feature apparently missing in knowledge—as suggested by Parker et al. (2012). Majority of consumers' actions are first mentally-shaped (Bandura, 1986) and, hence, in order to act they need to be internally convinced that they have adequate knowledge (Chung & Park, 2019).

Our findings on the link between debt behavior and other components of debt capability are in line with Fernandes, Lynch, and Netemeyer (2014), who hypothesized that the effect of financial knowledge on financial behavior found in their meta-analysis might be overestimated due to some "omitted factors" correlated with both financial knowledge and financial behavior. They found that the link between

financial knowledge and financial behavior weakens considerably after imposing control for numeracy and confidence in the financial information search (and two other factors)—that is, variables omitted by a majority of previous studies.

In light of our results, financial education might not be best targeted solely by improvements in the financial knowledge, but instead it should also be addressed through a customized way to promote financial skills and financial confidence. Perhaps, skills and confidence are much more important than financial knowledge to shape healthy financial behavior due to their action-related nature. It is symptomatic that the influential conceptual definitions of financial literacy and capability (Hung et al., 2009; Huston, 2010; Warmath & Zimmerman, 2019; Xiao & Porto, 2017) emphasize the role of the ability dimension. In their well-recognized article, Alba and Hutchinson (2000) underline the importance of skills in consumer expertise by defining them as an ability to perform product-related tasks successfully. Regrettably, only few operational measures of financial literacy and capability explicitly include the skill component. Recent studies increasingly argue that the disappointing effects of financial education on financial behavior may be due to the fact that education focuses almost solely on improving financial knowledge while neglecting other aspects of financial capability—such as skills and, especially, confidence (Chung & Park, 2019; Hadar, Sood, & Fox, 2013; O'Connor, 2019).

Limitations and Future Research

Our study documented very low debt capabilities in the Polish population. The shortcomings in the capabilities were corroborated both in terms of debt skills and objective debt knowledge. Such results are in line with the findings of other researchers (Cwynar, Cwynar, & Filipek, 2018; Cwynar et al., 2019; The Freedom Institute and Raiffeisen Polbank, 2014; OECD, 2016) and call for interventions aimed at improving the preparedness of Polish consumers to effectively participate in the debt market.

However, our study demonstrated that skills deserve a distinct role as a constituent factor of financial capability. Financial education programs should likely include dedicated teaching modules devoted strictly to developing financial skills. Perhaps a sort of experiment-based or game-like undertakings would be appropriate to ease the development of the skills in financial domain.

The analytical framework applied in our research does not address all the issues in financial capability. For instance, what we treated as the measure of debt skills is just a proxy of actual skills. The survey participants were not asked to solve a financial exercise in our study. Instead, they were asked to indicate correct responses to a set of single-choice questions probing their fluency in dealing with numbers in debt-related situations. Additionally, to a degree, our test of debt skills still has some knowledge-related aspects. It is an open question whether one can entirely avoid factual aspects when probing skills. On the other hand, the test resembles numeracy quizzes, though it is explicitly placed within the domain of household debt-related issues. Future researchers should try to refine the measurement of financial skills, preferably within a lab setting, and strive to demarcate financial knowledge, financial skills, numeracy, and other constituent components of (as well as other concepts related to) financial capability as clearly as possible. This might shed even more light on the isolated role of skills in shaping financial attitudes and behaviors.

Our findings also call for a conceptual definition and practical operationalization of financial skills and in-depth examination of their links to financial attitudes and behavior. Current conceptualizations raise some reservations. For instance, Warmath and Zimmerman (2019) measure skills through self-reports and omit numerical abilities, while French and McKillop (2016) measure financial management skills in a way which seems more appropriate for capturing financial behaviors than to probe financial skills.

What we established in our study confirms that the research on financial confidence is one of the most promising directions of future investigation. The findings presented in this article imply that for the sake of desired financial behaviors, the educational interventions should be aimed not only at closing the gap in financial knowledge—that is, the gap in what individuals *actually know* about financial matters—but they should also address the financial confidence—that is, what individuals *think they know* about financial matters. Undoubtedly, much remains to be done in the research area regarding the effect financial confidence has on various financial behaviors, including debt-related behavior. For instance, it needs to be clearly determined under what

conditions more confidence translates into more healthy financial behavior, and the opposite—in what situations the confidence promotes the unhealthy behavior. To ensure better insight into this critical relationship, future studies could adopt other, more sophisticated measures of financial confidence, different from the single-item self-report used in our study.

Finally, what we established in our study are just relationships, and not directions of causality in these relationships. Our data were cross-sectional and as such they do not allow for inferring about the cause-effect ties. Future research could capture the causal links by collecting longitudinal data.

Implications for Practitioners

Although the implications of our study are not causal, a strong link between skills and positive debt attitudes established in the study suggests that individuals with higher skills in the financial domain might exhibit lower debt aversion. Thus, by improving financial skills, practitioners might seek to increase the demand for credit. Practitioners might also target to boost financial confidence. It was shown that more financially confident individuals are more likely to seek credit for various purchases but also more inclined to get a mortgage. Finally, we showed that particularly damaging for debt behaviors are totally neutral attitudes which can be associated with lack of interest in the market.

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