



The Concept of Money Management Across Poverty Levels

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Abstract

In our field, there are few opportunities to examine (and demonstrate) the properties of existing measures. A recent survey of 993 US adults conducted by the National Endowment for Financial Education (NEFE) provides such an opportunity. In this study, we examine the factorial validity, reliability, and measurement invariance of the Brief Money Management Scale. Our central question is whether money management is a distinct construct for people living at or near the poverty line as compared to people living above that line (i.e., <100%, 100–200%, and >200% of the poverty line)—and, therefore, whether the scale can be used to make comparisons and draw conclusions across these groups. We found three main results: (a) The fit statistics from our confirmatory factor analysis were good, indicating that the hypothesized factor structure from the original study was confirmed with the NEFE data (i.e., evidence of factorial validity). (b) The scale and its sub-dimensions showed evidence of convergent and discriminant validity as well as acceptable levels of internal consistency (i.e., evidence of reliability). (c) We found evidence for scalar invariance, suggesting that people at different poverty levels interpret the items in the Brief Money Management Scale similarly. Thus, this scale can appropriately be used to compare money management behavior across US poverty groups. The mean differences we found (i.e., those <100% of the poverty line had lower levels of healthy money management than those >200% of the poverty line for the overall scale, the cash management sub-scale, and the insurance and investing sub-scale), then, indicate that individuals in these groups engage in money management behaviors at different rates—possibly due to differences in circumstances and constraints.

Keywords Measurement invariance · Money management · Poverty levels

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Introduction

In our field, there are few opportunities to examine (and demonstrate) the properties of existing measures (Lavigne & Xiao, 2023). A recent survey of 993 US adults conducted by the National Endowment for Financial Education (NEFE) provides such an opportunity. The NEFE survey included the Brief Money Management Scale (BMMS; Ksendzova et al., 2017) and set quotas to ensure a usable sample across all income levels. While there are several scales that measure financial or money management behavior (e.g., Dew & Xiao, 2011; Prochaska-Cue, 1993), the BMMS is one of the most recent. This scale was developed in part to address some psychometric weaknesses in Dew and Xiao's (2011) oft-used scale, such as the lack of sufficient reliability of the cash and credit management subscales (Donnelly et al., 2013; Ksendzova et al., 2017). The BMMS contains four factors (18 items) reflecting an individual's management of cash (e.g., *Follow a weekly or monthly budget*), credit (e.g., *Get myself into more and more debt each year*), savings

(e.g., *Regularly set aside money for savings*), and insurance/investment (e.g., *Contribute to a retirement savings plan*). The scale was developed using a series of four studies conducted with university students and community members. Although Ksendzova et al. (2017) has been cited by 69 studies, no study was found that used their scale. Thus, no work was found that examined the measurement properties of the BMMS beyond their original work. While the scale development studies provide evidence of reliability (i.e., consistency of the measure), more work is needed to confirm the validity of the scale (i.e., accuracy of the measure). No work considered the measurement invariance properties of their scale.

In this study, we examine the factorial validity, measurement invariance, and reliability of the BMMS (Ksendzova et al., 2017) using secondary data collected from 993 US adults by the National Endowment for Financial Education (NEFE). Our central question is whether money management is a distinct construct for people living at or near the poverty line as compared to people living above that line. An individual's ability to manage their money has been hypothesized as a necessary skill in achieving and maintaining financial well-being (Drever et al., 2015; Netemeyer et al., 2018). Research regarding differences in financial behavior by income or socio-economic status suggests that money management is different for people living with fewer (versus greater) financial means (Azlam et al., 2024; Loibl et al., 2021; Putri et al., 2022; Rahmawati & Marcella, 2023; Serido et al., 2020; Spuhler & Dew, 2019; Xiao et al., 2011). De Bruijn and Antonides (2022) posit that poverty is associated with unhealthy financial behaviors which may be driven by scarcity mindset may be induced by poverty itself. With poverty, there exists a constant focus on the potential costs for everyday emergencies as those in poverty live in the context of managing scarce resources and each financial decision must be precise, with no room for error or miscalculation (Shafir, 2017).

The question, however, is whether the concept of money management differs or just the level of engagement in prudent behavior. It may be that money management is the same construct and differences in scores on the BMMS reflect true differences in money management. Perhaps these differences in money management are due to resource constraints or less access to financial products or services. It may also be that the money management construct itself means something different when an individual or family lives at or below the poverty line than when they live above that line. In this case, the BMMS (or other money management scale) may not accurately reflect money management for both groups. Can the BMMS, as one existing scale to assess money management behavior, accurately reflect differences in money management behavior across poverty

levels? To address this question, we consider validity, reliability, and measurement invariance for this scale by poverty level (<100%, 100–200% and >200%).

Assessing the validity of the scale involves confirming the construct that is reflected by the scale items. The question asked is whether the scale measures the intended construct adequately (DeVellis & Thorpe, 2021). The exploratory factor analysis conducted in the scale development studies identified the underlying factor structure of the BMMS. Confirmatory factor analysis, especially when conducted using structural equation modeling, provides an assessment of the extent to which the hypothesized factor structure, including hypothesized sub-dimensions, fits a new set of data (Netemeyer et al., 2003). Thus, confirmatory factor analysis can also assess whether the theoretical construct is best reflected in a unidimensional or multidimensional scale. Beyond an assessment of whether the hypothesized factor structure fits the data, validity can be assessed by correlating the measure with validated measures of theoretically related (convergent validity) and unrelated (discriminant validity) constructs. While the original BMMS scale development efforts compared BMMS scores with behavior in a debt repayment simulator (Ksendzova et al., 2017), no other efforts to examine convergent or discriminant validity were found. In the current study, we will test whether the BMMS is positively correlated with the propensity to plan for money long-term, as we would theoretically expect (i.e., convergent validity), and whether the BMMS is *not* significantly correlated with difficulties brought on by physical, cognitive, or emotional challenges, as we would theoretically expect (i.e., discriminant validity).

Measurement invariance is necessary for testing whether a scale measures the same construct across different groups (or over time (Vanderberg & Lance, 2000)). “Measurement noninvariance suggests that a construct has a different structure or meaning to different groups and so the construct cannot be meaningfully tested or construed across groups” (Putnick & Bornstein, 2016, p. 71). Using a noninvariant measure means that we are not measuring the same construct across the groups (or time) and, therefore, cannot compare our results as indicators of differences in the construct of interest (Borba & Spence, 2024; Vanderberg & Lance, 2000). Put simply, measurement invariance means we’re comparing apples to apples when applying the measure, while measurement noninvariance (i.e., lack of measurement equivalence) means we’re comparing apples to oranges.

Measurement invariance testing often involves three levels: *configural*, *metric* (also known as *weak*), and *scalar* (also known as *strong*). (Sometimes, a fourth level—*strict*—is also tested). Configural determines whether the factor structure is the same across groups and is considered

a baseline measure of invariance (Vanderberg & Lance, 2000). Metric invariance determines whether there is equivalence of factor loadings across groups, meaning that the relationship between each item in the scale and the factor is the same across the groups (Borba & Spence, 2024). Scalar invariance determines equivalence of item intercepts across groups, meaning that mean responses to each item should be the same among people with the same overall score on the scale (Vanderberg & Lance, 2000). There are several good sources for more information on measurement invariance (e.g., Putnick & Bornstein, 2016).

Measurement invariance testing is essential before testing differences (e.g., mean differences) in a construct across groups or making any conclusions about the construct for different groups and so should be conducted as part of scale development and when using scales with new populations. If measurement noninvariance exists but remains undetected due to lack of testing, researchers may draw inaccurate conclusions and, if applied in policy or practice, can do real-world harm. As an example specific to the current study, if the BMMS is in fact noninvariant across poverty level, assuming invariance could lead to inaccurate research-based conclusions about group differences in money management by poverty level that could mislead policy and practice aimed to help impoverished groups.

This paper contributes to the understanding of the BMMS as a measure of money management. To the extent that BMMS is a valid, reliable, and invariant measure of money management across poverty levels, it provides a useful tool

for researchers and practitioners studying or working with these subgroups (LeBaron et al., In press). Thus, the results of this study can inform researchers studying money management behavior who are selecting measurements for their study as well as practitioners and policymakers who might be using the scale or research conducted with the scale. In addition, this study contributes to a larger conversation about measurement in our field following the examples of Buabang and colleagues (2022) who examined the Prawitz et al. (2006) financial distress scale and Sorgente and colleagues (2020) who examined the Barber et al. (2011) financial identity scale. The unique approach to data collection in the NEFE study and the methods we used to examine the BMMS can inform researchers and practitioners who use any of the currently available scales.

Methodology

Data

The data used in this paper is secondary data collected by the National Endowment for Financial Education (NEFE) for their Scale Validation Project.¹ Respondents were recruited by Qualtrics Panel Services from late October 2022 through mid-January 2023. Survey respondents were U.S. adults (ages 18 and up). The final non-probability sample consisted of 993 respondents. As shown in Table 1, the average participant was 40.3 years old (SD=17.1) with a household income of \$58,838 (SD=\$53,705). Twenty-nine percent had a bachelor's degree or higher, 48.4% were White, and 69.1% were female at birth. Twenty percent of participants (n=200) were at or below 100% of the poverty line, 8.9% (n=88) were above 100% and at or below 200%, and 71.0% (n=705) were greater than 200% of the poverty line.

Measures

Fourteen of the 18 items from the BMMS were included in the survey. These fourteen items represented the credit, cash, and insurance/investment factors. The four items from the savings factor were not included in the NEFE study.² Response options ranged from Never (coded as 1) to Always (coded as 5). Items were summed to their factors. The credit and insurance/investment factors had five items each with a score ranging from 5 to 25. The cash factor had four items with a score ranging from 4 to 20. Due to the manner in

Table 1 Sample characteristics

Characteristic	Total sample		Mean incidence		
	Mean incidence	Std dev N	<100%	100–200%	>200%
Age in years	40.3	17.1	33.7	35.8	42.6
Income	\$58,838	\$53,705	\$8,648	\$28,058	\$68,220
Female	69.1%	686	79.2%	74.1%	66.8%
White	48.4%	481	41.5%	51.2%	50.2%
Black	23.1%	229	25.9%	26.7%	22.4%
Hispanic	18.5%	184	26.4%	19.8%	16.5%
Asian	7.8%	77	7.3%	3.5%	7.8%
Another race	9.5%	94	9.8%	11.6%	8.6%
Bachelor's degree or higher	29.2%	290	8.8%	17.4%	34.9%
Poverty level					
<100% of poverty line	20.1%	200			
100–200% of poverty line	8.9%	88			
>200% of poverty line	71.0%	705			

¹ See <https://www.nefe.org/research/research-initiatives/scale-validation.aspx> for more information about NEFE's Scale Validation project.

² NEFE elected not to include questions from the saving subscale because they were similar to questions from the personal savings orientation day-to-day scale, which was also included in the survey.

which the questions were worded, higher scores on the insurance/investment and the cash factors indicated more potentially helpful money management behaviors, whereas higher scores on the credit factor indicated more potentially harmful money management behaviors.

Poverty level was identified using three survey items: income, marital status, and number of children. Income was asked in 11 ranges with the lowest range being Less than \$10,000 and the highest range being \$200,000 or more. These ranges were recoded to their midpoint with \$4,999 used for the lowest range and \$249,999 used for the highest range (for the highest income category, the midpoint was inferred due to the maximum value being unknown). Marital status was assessed as Married, Multiple partners (married or unmarried), Registered domestic partner, Unmarried partner, Divorced, Separated, Widowed, and Single Never Married. The presence of dependents was asked as How many minors (aged 17 or younger) do you have who are financially dependent on you? Response options were 0, 1, 2, 3, and 4 or more. Marital status and presence of dependents were combined to produce a household size variable. If the participant was married, registered domestic partner, or unmarried partner, a base household size of two was assigned and added to the number of dependent children with 4.5 being used for the 4 or more response. If the participant indicated any other marital status, a base household size of one was assigned and added to the number of dependent children.

We then added the 2023 poverty line by household size to the file (<https://www.healthcare.gov/glossary/federal-poverty-level-fpl/>). Household income was compared to the poverty line for each participant given their household size. Poverty level was calculated as the percent of the poverty line that the household's income represents. If the percentage was less than or equal to 100%, the participant was identified as poverty level group 1 (100% or less of the poverty line). If the percentage was greater than 100% and less than or equal to 200%, the participant was identified as poverty level group 2 (100–200% or less of the poverty line). If the percentage was greater than 200%, the participant was identified as poverty level group 3 (greater than 200% of the poverty line). So, for example, for a family of four the 2023 poverty level is \$30,000. If the respondent selected the \$35,000–\$49,999 category of household income, their household income was coded as \$42,500, which is the midpoint of the income range (Netemeyer et al., 2018). To calculate this hypothetical respondent's poverty level group, we then divided \$42,500 by \$30,000, which indicates that this

household is 142%³ of the poverty line given their household. So, they would be placed into poverty level group 2.

Propensity to plan for money long-term was assessed by asking: *To what extent do you agree or disagree with the following statements? I set financial goals for the next 1–2 years for what I want to achieve with my money; I decide beforehand how my money will be used in the next 1–2 years; I actively consider the steps I need to take to stick to my budget in the next 1–2 years; I consult my budget to see how much money I have left for the next 1–2 years; I like to look to my budget for the next 1–2 years to get a better view of my future spending; It makes me feel better to have my finances planned out in the next 1–2 years.* Response options were: *Strongly agree* (coded as 5) to *Strongly disagree* (coded as 1). Responses were summed to create the measure with scores ranging from six (low propensity) to 30 (high propensity).

Difficulty with activities due to physical cognitive or emotional challenges was assessed by asking the participant: *Do physical, cognitive, or emotional challenges cause you difficulty with: Select all that apply.* The response options were: *Dressing, bathing, or moving around inside the home; Engaging in social activities or situations; Finding, keeping, or having a job; Going outside the home alone (e.g., to shop or to the doctor's); Hearing; Maintaining interest or pleasure in engaging in activities; Making or maintaining close friendships; Seeing (vision); Remembering, concentrating, or decision making; Walking, climbing stairs, using your hands, reaching, lifting, or carrying.* Options were coded as 1 if selected and 0 if not selected. The measure was created as a count of the number of options selected.

Statistical Analysis

Descriptive statistics were calculated using SPSS version 29 for sample characteristics. Factorial validity was assessed through a confirmatory factor analysis conducted in MPlus version 8 (Muthén & Muthén, 2021) using MLR estimator. This analysis revealed the fit between the hypothesized factor structure of the BMMS and the NEFE data. The original multidimensional BMMS was compared to a model assuming a single dimension. Fit statistics examined were the χ^2 statistic, Root-Means-Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Standardized Root Mean Residual (SRMR).

The χ^2 statistic measures the discrepancy between the observed covariance matrix and the model-implied covariance matrix. RMSEA is a measure of how well the model

³ This statistic is called the Ratio of Income to Poverty. More information on this calculation can be found at <https://www.census.gov/topics/income-poverty/poverty/guidance/poverty-measures.html>.

fits the covariance matrix relative to the degrees of freedom in the model. A smaller RMSEA value (typically less than 0.08) indicates a better fit, with values closer to 0 indicating better fit. CFI compares the fit of the specified model to a baseline model that represents independence among the observed variables. CFI ranges between 0 and 1, with values closer to 1 indicating better fit. Like CFI, TLI values range between 0 and 1, with higher values indicating better fit. CFI and TLI values above 0.90 are often considered acceptable, while values above 0.95 suggest good fit. SRMR measures the average discrepancy between the observed and model-implied covariance matrices, standardized by the square root of the observed variances and covariances. Like RMSEA, lower SRMR values indicate better fit, with values close to 0 indicating better fit.

Convergent validity (i.e., the presence of a relationship between measures that assess similar constructs) was assessed by correlating BMMS with the propensity to plan for money long-term. Discriminant validity (i.e., the absence of a relationship between measures that are theoretically different) was assessed by correlating BMMS with the experience of difficulty due to physical, cognitive, or emotional challenges. Internal consistency or reliability was assessed using Cronbach's Alpha, which provides a lower-bound estimate.

Measurement invariance was assessed using the procedures available in MPlus for configural, metric, and scalar invariance with the "MODEL=" command. Using maximum likelihood estimation, MPlus assesses configural invariance by keeping the same factor structure across the groups, metric invariance by keeping the same factor loadings across the groups, and scalar invariance by keeping the same intercepts across the groups (Muthén & Muthén, 2021). To identify whether invariance was found, a less than 0.01 change in CFI was used. Change in CFI has been shown to be a robust criterion in measurement invariance testing and less sensitive to factors such as sample size (Chen, 2007). The adequacy of our sample for invariance testing by poverty level was assessed using the Kaiser–Meyer–Olkin (KMO) measure (Cerny & Kaiser, 1977; Nunes et al., 2020).

Following our confirmation of the BMMS measurement properties, we conducted a one-way ANOVA to determine whether respondents in the different poverty levels engaged in significantly different money management behaviors. This method was appropriate given that our dependent variables were interval scales and our independent variable (poverty group) had three independent categories. Our observations were also independent of each other. Prior to conducting the one-way ANOVA, we assessed whether the data contained significant outliers, was approximately normal using skewness, and showed evidence of homogeneity of variances using Levene's test.

Table 2 BMMS factor loadings

Factor	Item	Loading	S.E
Insurance and investing	Maintained or purchased an adequate property insurance policy	0.709	0.019
	Maintained or purchased an adequate health insurance policy	0.671	0.021
	Maintained or purchased adequate life insurance	0.684	0.020
	Contributed to a retirement savings plan (e.g., 401 k)	0.604	0.023
	Reviewed the adequacy of the insurance coverage that you have	0.762	0.017
Credit	Did not pay the total balance on my credit card but instead just made a partial payment	0.723	0.018
	Made only minimum payment on a loan	0.720	0.018
	Maxed out the limit on one or more credit card(s)	0.773	0.016
	Got yourself into more and more debt each year	0.811	0.014
Cash	Spent more money than you have	0.745	0.017
	Followed a weekly or monthly budget	0.656	0.022
	Reviewed and evaluated spending on a regular basis	0.785	0.017
	Kept a written or electronic record of your monthly expenses	0.690	0.020
	Estimated your household income and expenses	0.739	0.019

Table 3 Convergent and discriminant validity

Variable	Correlation with BMMS
Propensity to plan for money long-term	0.412, $p < 0.001$
Difficulty with activities	0.032, $p = 0.311$

Results

Factorial Validity

The confirmatory factor analysis using the three subscales (insurance & investing, credit, and cash) produced a model with good fit between the hypothesized factor structure and the NEFE data ($\chi^2_{(74)} = 210.921$, TLI = .0.970, CFI = .0.976, RMSEA = .0.043, SRMR = .0.038 (Hu & Bentler, 1999)). The three-dimension structure fit the data much better than a single BMMS factor ($\chi^2_{(77)} = 2273.653$, TLI = .0.539, CFI = .0.310, RMSEA = .0.169, SRMR = .0.133). As shown in Table 2, standardized factor loadings for all items exceeded the .6 threshold (Bagozzi & Yi, 1988).

Convergent and Discriminant Validity

As shown in Table 3, BMMS was positively correlated with the propensity to plan for money long-term ($R = 0.412$, $p < 0.001$) and not with difficulties brought on by physical,

cognitive, or emotional challenges ($R=0.032$, $p=0.311$), as expected.

Internal Consistency

As shown in Table 4, Cronbach's Alpha was above established thresholds for each of the three dimensions and their combination (Cortina, 1993; DeVellis & Thorpe, 2021).

Measurement Invariance Across Poverty Levels

Using KMO sphericity (Kaiser, 1974), we determined that the three poverty levels (<100%, 100–200%, and >200% of the poverty line) had sampling adequacy to support measurement invariance testing (<100%: 0.910; 100–200%: 0.817; >200%: 0.895). Given that all categories were above the threshold of .6 (Kaiser, 1974), we assessed measurement invariance for each subscale of the BMMS between poverty levels. Relying on our change in CFI (Chen, 2007), the results supported scalar invariance. As shown in Table 5, fit statistics for the configural, metric, and scalar invariance models showed evidence of good fit (Hu & Bentler, 1999). The changes in CFI between the configural, metric, and scalar invariance models were not significant.

Examining measurement invariance separately by subscale (Table 6), we observed similar results. Fit statistics for the configural, metric, and scalar invariance models showed evidence of good fit (Hu & Bentler, 1999). The changes in CFI between the configural, metric, and scalar invariance models were all below the 0.01 threshold with one exception. The change in CFI from the metric to the scalar model for the insurance and investing subscale was 0.12.

Table 4 Cronbach's Alpha

Scale dimension	Cronbach's alpha
Insurance and investing	0.815
Credit	0.868
Cash	0.808
Brief money management scale (all items)	0.867

Differences in Money Management by Poverty Level

These findings for factorial validity, reliability, and measurement invariance suggest that comparisons in money management behavior can be made across poverty groups using the BMMS. Thus, we proceeded to an examination of differences in money management behavior across poverty levels. In our assessment of the assumptions for a one-way ANOVA, no significant outliers were observed in the data. The skewness of the BMMS subscales and total scores suggested that the data was approximately normal (Investing & Insurance = −0.117; Credit = −0.220; Cash = −0.205). Levene's test suggested homogeneity of variances ($p>0.05$ for all subscales).

As shown in Table 7, there are significant differences between the <100% and >200% poverty levels for insurance & investing and cash dimensions and the overall BMMS score. More specifically, respondents in households well above the poverty line exhibit somewhat better insurance/investment and cash money management behaviors than those at or below the poverty line. No significant differences were observed between either of these groups and the 100–200% poverty group on these dimensions or overall score, although the sample size for this group was relatively small. No significant differences between the groups were observed for the credit subdimension.

Table 5 Measurement invariance model results

	Model	χ^2	<i>df</i>	TLI	CFI	RMSEA		Δ CFI
M1	Configural Invariance	376.212	222	0.972	0.966	0.047		
M2	Metric Invariance	405.463	244	0.971	0.967	0.045	M2 versus M1	0.001
M3	Scalar Invariance	470.736	266	0.963	0.962	0.049	M3 versus M2	−0.005

Table 6 Measurement invariance model results by sub-scale

	Model	χ^2	<i>df</i>	TLI	CFI	RMSEA		Δ CFI
Insurance and investing sub-scale								
M1	Configural Invariance	25.701	15	0.993	0.986	0.047		
M2	Metric Invariance	42.172	23	0.987	0.983	0.051	M2 versus M1	0.003
M3	Scalar Invariance	675.759	31	0.970	0.971	0.056	M3 versus M2	0.012
Credit sub-scale								
M1	Configural Invariance	27.571	15	0.994	0.988	0.051		
M2	Metric Invariance	35.824	23	0.994	0.992	0.042	M2 versus M1	−0.004
M3	Scalar Invariance	58.839	31	0.987	0.988	0.043	M3 versus M2	0.004
Cash sub-scale								
M1	Configural Invariance	5.888	6	1.000	1.000	0.000		
M2	Metric Invariance	16.063	12	0.997	0.995	0.032	M2 versus M1	0.005
M3	Scalar Invariance	25.327	18	0.994	0.994	0.036	M3 versus M2	0.001

Table 7 One-way ANOVA of money management differences by poverty group

Scale/dimension	< 100% poverty Line ^a	100–200% poverty line ^b	> 200% poverty line ^c
Insurance and investing	12.98 ^c	13.70	15.21 ^a
Credit (reverse scored)	16.99	16.12	17.28
Cash	11.91 ^c	12.65	13.29 ^a
Overall	41.89 ^c	42.67	45.78 ^a

Superscript letters indicate significant differences between groups at $p < 0.05$

Discussion

In this study, we examined whether the BMMS provided a valid, reliable, and invariant measure of this behavior overall and across poverty groups. We found that this scale was a valid, reliable measure overall, at least for the three sub-dimensions included in the NEFE study. The fit statistics from our confirmatory factor analysis were good, indicating that the hypothesized factor structure from the original study (Ksendzova et al., 2017) was confirmed with the NEFE data. BMMS was correlated with the propensity to plan for money long-term, offering evidence of convergent validity. BMMS was not correlated with whether the individual experienced difficulties with activities such as personal care, leaving their home, or engaging in social events due to physical, cognitive, or emotional challenges, offering evidence of discriminant validity. In addition, the scale and its sub-dimensions showed acceptable levels of internal consistency (Nunnally & Bernstein, 1994).

In our measurement invariance analysis, we found support for configural invariance, indicating that the factor structure was equivalent across the poverty groups (Vanderberg & Lance, 2000). In other words, the “construct was conceptually equivalent” across the poverty groups (Borba & Spence, 2024, p. 73). We also found support for metric invariance, indicating that the factor loadings were similar across these groups (Vanderberg & Lance, 2000). In other words, “the relationships between these items and their respective latent constructs remain unchanged” (Borba & Spence, 2024, p. 73). The change in CFI supported scalar invariance in all cases except for the separate examination of the insurance and investing subscale. Given the relative robustness of the CFI, we followed the recommendation of Chen (2007) to rely on the change in CFI of less than 0.01 as our main criterion. The selection of CFI was also supported by the fact that CFI is less sensitive to sample size than χ^2 and is currently used in roughly three quarters of measurement invariance studies (Cheung & Rensvold, 2002; Putnick & Bornstein, 2016). When using alternative fit indices such as CFI, sample size becomes less important, assuming adequate power (Putnick & Bornstein, 2016). In addition,

the KMO measure suggested that our sample was adequate for invariance testing by poverty level.

Scalar invariance indicates that the intercepts for the BMMS sub-dimensions are the same across poverty groups. In other words, people across the groups with the same BMMS score do not have different intercepts on the observed variables (Vanderberg & Lance, 2000). The only caution here comes from the separate examination of the insurance and investing subscale where the change in CFI was above the .01 threshold ($\Delta\text{CFI} = 0.012$) suggesting that scalar invariance was not supported. Taken together, these findings suggest that—with the exception of insurance and investing—people at different poverty levels interpret the items in the BMMS similarly (Borba & Spence, 2024). Thus, this scale can be used to compare money management behavior across poverty groups. It is not that people at different poverty levels interpret money management differently but that they engage in money management behaviors at different rates. However, for insurance and investing, the lack of scalar invariance indicates that item intercepts differ across poverty groups; thus, mean differences on this subscale could reflect response biases rather than true differences in the construct.

What do these comparisons tell us? We observed that people < 100% of the poverty line tended to have lower scores on the insurance and investing sub-dimension (which should be interpreted with caution, given the lack of scalar invariance) as well as the cash sub-dimension than people at > 200% of the poverty line. These differences suggest that people at < 100% of the poverty line engage in significantly fewer money management behaviors related to cash management and/or engage in them less often than people at > 200% of the poverty line, and the same *may* be true for insurance and investing (although these means might not be comparable). The fact that the BMMS is (mostly) invariant across the poverty levels allows us to draw this conclusion from the results. This finding could be due to many reasons including the fact that higher income respondents would have a greater ability to purchase insurance and invest when compared to respondents with lower incomes. The BMMS captures behavior without identifying the reasons for the behavior. The fact that there were no observed differences on these sub-dimensions between either the < 100% or the > 200% groups and the 100–200% group suggests a gradual change in money management behavior as income rises.

There were, however, no differences observed between any of the groups for the credit sub-dimension suggesting that households living well above the poverty line are not exhibiting significantly better credit management behaviors (Anderloni et al., 2012) than households living below the poverty line with greater financial constraints (Loibl, 2017).

Table 8 FINRA foundation NFCS statistics on credit card ownership and alternative financial services use by income

Income	% With credit card	% Using alternative financial services
Less than \$15,000	46.0	44.4
\$15,000–\$24,999	62.4	43.9
\$25,000–\$34,999	71.1	38.6
\$35,000–\$49,999	79.0	32.9
\$50,000–\$74,999	87.4	26.2
\$75,000–\$99,999	91.2	24.8
\$100,000–\$149,999	94.8	22.5
\$150,000–\$199,999	96.2	22.4
\$200,000–\$299,999	97.0	19.1
\$300,000 or more	94.3	17.1

Although the current study does not provide information for interpreting the reasons for this finding, some previous research might provide insights. For example, previous research has found that there are differences in sources of credit for households across poverty levels. It is important to note that households across poverty levels are likely to have debt even if that debt is of different forms (Kim et al., 2017). For example, the most recent FINRA Foundation National Financial Capability Study (NFCS) data (Table 8) shows that while households with higher income are more likely to have credit cards, households with lower income are more likely to use alternative financial services (e.g., auto title loans, payday loans, pawn shops). Two of the statements in the credit sub-dimension of the BMMS reference credit cards directly (not paying the total balance and maxing out the limit) while the other three statements refer to loans, debt, and spending relative to available money. The BMMS does not define what constitutes a credit card. It is possible that lower income individuals might consider a Visa gift card, for example, to be a credit card and report more favorable behaviors given the differences between the gift card and credit card. Our study identifies that the BMMS can be used to compare credit management behavior across poverty levels. Future studies will need to examine the determinants of differences (or lack thereof) observed.

The comparison of BMMS scores does not, however, necessarily suggest that households well above the poverty line have better money management *skills* or *capabilities* than households at or below the poverty line. It is important to remember that this scale measures behavior and not ability. Thus, we can consider the potential reasons that these behavioral differences exist (Warmath et al., 2022). One reason might be differences in circumstances and constraints (Loibl, 2017). For example, it is possible that, given their life circumstances, households at or below the poverty line have less of a need for some forms of insurance and, therefore, engage in fewer behaviors or engage in those behaviors

less often. It is also possible that people below the poverty level are less likely to own a home and consequently less likely to purchase adequate property insurance. They may also be less likely to work for a company that offers a retirement plan, so less likely to engage in the retirement-related money management behaviors that the scale assesses.

Because our measurement invariance results indicate that we are able to assess group differences in the BMMS by poverty level in the United States (with the possible exception of insurance and investing), we can then responsibly apply any findings of the BMMS by poverty level to policy and practice implications. Such implications could include that insurance, investing, and cash management may be worthwhile targets for helping people out of poverty. Basic financial education that can reach impoverished communities, such as through state extension programs, might focus on budgeting and tracking of income versus expenditures. Although impoverished people are less likely to have stable, regular income, the tracking of any cash flow would likely still be helpful. Given that medical debt is salient for impoverished people in the United States, policies that help meet impoverished people's basic insurance needs and keep healthcare costs low could help them avoid some catastrophic situations and possibly help some escape the poverty cycle (Petach & Wyant, 2024). As such, financial education that teaches impoverished people how to wisely invest and programs that help them actually be able to invest (which will likely be difficult for those struggling to meet basic needs) could help them escape the poverty cycle and reduce intergenerational wealth inequalities. Finally, lessening the burden of poverty for individuals, especially children, might improve cognitive functioning and decision-making, including money management decisions (Kuhnén & Miu, 2017).

Limitations

There are several limitations of this analysis that should be considered in the interpretation of the study results. First, it is a significant limitation that the available data contained only three of the four dimensions of the BMMS (the savings dimension was not available). Thus, this analysis could not consider the entire scale. It is also important to note that the BMMS is not the most widely used scale. Researchers using other scales should apply the methods used here to examine their selected scale. Second, it is not clear how the natural imbalance in sample size across groups affected our measurement invariance results. One simulation study suggested that unequal sample sizes can lead to inconclusive measurement invariance results (Yoon & Lai, 2018) while a review of conventions and best practices in existing measurement

invariance studies concluded that “sample size, number of groups, and model degrees of freedom were unrelated to the level of invariance achieved” (Putnick & Bornstein, 2016, p. 81). In our study, we followed current best practices. Third, while the KMO sphericity indicated sufficient sample size for the measurement invariance analysis, the small number may have impacted our ability to detect differences between groups once measurement invariance was confirmed. As such, the non-significant findings when comparing the other groups to the 100–200% group should be interpreted with caution. Fourth, the cross-sectional data used in this analysis limits our ability to assess whether the factorial structure and reliability are consistent over time, and to test measurement invariance over time. Fifth, it is also important to note that the NEFE data oversampled on gender beyond the categories of male and female. Care should be taken to generalize results beyond the current sample. Sixth, measurement invariance was considered only for the percentage of poverty level. Therefore, the study cannot speak to the measurement invariance of this scale for other demographic categories. Finally, income was measured using categories, so it is an approximation and perhaps could have been measured more precisely.

Conclusion

Findings from this study provide evidence for the factorial validity, reliability, and measurement invariance of the insurance & investing, credit, and cash sub-dimensions of the BMMS. The measurement invariance findings suggest that this scale captures the concept of money management similarly for people living at different poverty levels and can be used to compare money management behaviors across those groups. Using this scale, our findings suggest that the money management behavior of respondents living in households at or below the poverty line differ from the behavior of respondents living in households well above the poverty line.

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