



# The Importance of Money Scale (IMS): A new instrument to measure the importance of material well-being

Axel Franzen<sup>\*</sup>, Sebastian Mader

*Institute of Sociology, University of Bern, Fabrikstrasse 8, 3012 Bern, Switzerland*

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## ABSTRACT

A fundamental assumption in the social sciences is that humans are motivated by the concern for material well-being. However, despite its central importance for many behavioral areas (e.g. consumption, labor market decisions, participation in education), there is no satisfying survey instrument to measure the importance of material well-being. In this paper, we suggest a short 8-item scale to measure the importance of money. In study 1, we test the new scale in a sample of 510 students with respect to its reliability, construct validity, and external validity using the multitrait-multimethod approach first suggested by Campbell and Fiske (1959). In study 2, we test the scale in a random population sample ( $N = 2914$ ) with respect to its external validity. Our results suggest that the new importance of money scale (IMS) has high reliability and validity, and outperforms comparable measures with respect to its external and predictive validity.

## 1. Introduction

Money and the desire for physical well-being is one of the most fundamental human motivators. This idea can already be found in the work of Adam Smith (1776) and is mirrored in seminal contributions in psychology and economics, e.g. in Abraham Maslow's (1942) theory of human motivation, or in Gary Becker's (1964) human capital theory. Physical well-being is of course not the only way by which humans try to "better their condition" (Smith, 1776: 343). The other prominent candidate is social approval. This idea is also already contained in the work of Adam Smith, for instance when he wrote "Nature, when she formed man for society endowed him with an original desire to please and an original aversion to offend his brethren" (Smith, 1759: 116). Some interpretations of Smith (e.g. Witztum, 2005) suggest that Adam Smith viewed the desire for social approval as being more fundamental than the desire for physical well-being, but the latter is certainly independent and often in competition with the former. One example is labor market decisions: The most well-paid job may not be the one with the highest social prestige, and donating money to others increases social reputation but reduces one's own consumption possibilities. While there are well-tested working survey instruments to measure the need for social approval (Martin, 1984), this conclusion does not hold true for the measurement of the importance of physical well-being. Despite its fundamental importance there exist to date only a limited number of

instruments designed to measure the importance of money and material well-being. This conclusion was already drawn by Furnham (1984) and is still valid today.

The goal of this article is to suggest a new instrument to measure the importance of physical well-being. The scale should be short, one-dimensional, and easy to administer in surveys. It should also have high reliability, high construct validity, and high external validity. Furthermore, suggesting a new or improved scale only makes sense if it can be demonstrated that the new instrument outperforms existing alternatives. This can best be accomplished by following the multitrait-multimethod approach first suggested by Campbell and Fiske (1959). The basic idea of the multitrait-multimethod design is that a new instrument should be compared with at least one other similar instrument, and the measurement should be repeated at least once to assess its test-retest reliability and its convergent validity. In what follows we try to accomplish all these goals. First, we will briefly review the existing suggestions for measuring the importance of money in the next section. As will become evident, most of the existing scales are extensive and multidimensional. Still, some of the subscales already contain some elements of the construct we are interested in. This section concludes with an assessment of what can already be found in the literature and of what is still missing. In Section 3 we present a new survey instrument to measure the importance of material well-being. We then describe the results of an extensive empirical test of the scale by using the multitrait-

<sup>\*</sup> Corresponding author.

E-mail addresses: [axel.franzen@unibe.ch](mailto:axel.franzen@unibe.ch) (A. Franzen), [sebastian.mader@unibe.ch](mailto:sebastian.mader@unibe.ch) (S. Mader).

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multimethod design. For this purpose, in study 1, we repeatedly surveyed a sample of 463 university students using two different methods, self-administered online questionnaires and face-to-face interviews. This allows us to establish the instrument's test-retest reliabilities, and its convergent and discriminant validity. Moreover, the section also contains various tests of the instrument's external validity. Furthermore, in study 2, we included the new scale in a random sample of the Swiss population and demonstrate that the scale proves to have high reliability as well as high external validity. Finally, Section 5 concludes and discusses our findings.

## 2. Literature review

One recent attempt to measure attitudes towards money stems from Furnham (1984), and Lay and Furnham (2018). In the former paper, Furnham (1984) intended to develop a comprehensive measure of attitudes towards money, which he called the Money Beliefs and Behavior Scale (MBBS). For this purpose, he collected 60 items originally suggested by Yamauchi and Templer (1982), Goldberg and Lewis (1979), and Rubinstein (1980). A factor analysis extracted 6 dimensions which Furnham tagged Obsession (Factor 1, consisting of 18 items), Power/Spending (Factor 2, consisting of 8 items), Retention (Factor 3, consisting of 6 items), Security/Conservative (Factor 4, consisting of 8 items), Inadequacy (Factor 5, consisting of 7 items), and Effort/Ability (Factor 6, consisting of 4 items). The item representing the first factor best reads "I am proud of my financial victories – pay, riches, investments, etc. – and let my friends know about them". Power/Spending is characterized by the item "I sometimes 'buy' friendship by being very generous to those I want to like me". Retention is represented by the item "Even when I have sufficient money, I often feel guilty about spending money on necessities like clothes etc.". Factor 4, Security/Conservative, is described by the item "I am proud of my ability to save money". The Inadequacy component (Factor 5) is represented by the item "Most of my friends have more money than I do". Finally, the last factor Effort/Ability is characterized by the item "I believe that my present income is about what I deserve given the job I do".

In the latter paper, Lay and Furnham (2018) suggest a new scale consisting of 5 factors with 5 to 6 items each (28 items overall). The first factor of this new Money Attitudes Measure is called Achievement and Success, and consists of 6 items. A characteristic item states "Money is a really good indicator of a person's life achievements and success". Factor 2 is called Saving Concerns. A typical item reads "I never seem to have enough money". Factor 3 is titled Mindfulness and Responsibility, and a representative item is "I am pretty good at budgeting". Factor 4 is called Power and Status and an item example reads "I enjoy buying expensive products to impress others". Finally, Factor 5 is called Financial Literacy Worries and a typical item is "I feel foolishness and embarrassment talking about many money issues".

Both scales, and particularly the latter one, are certainly valuable suggestions for measuring what they intend to measure: attitudes about money, e.g. how people use money, or how competent they feel about financial issues. However, what they do not measure is how important material well-being or money is for an individual, or at least none of the items addresses this issue in a direct manner. The subscale that comes closest to what we are interested in is the first factor called Obsession. However, a look at the items reveals that the obsession factor addresses various topics such as "being proud of financial victories" and "showing this to friends". However, being proud of financial achievement and showing it to others are different things, and we suspect that the item is two-dimensional, making it an imperfect measure for either dimension.

A slight variation of Furnham's (1984) original MBBS was suggested by Wilhelm et al. (1993). Wilhelm et al. (1993) used 38 items from the MBBS and replicated the extraction of six factors already suggested by

Furnham (1984). However, they decided to drop two of the six factors (Conservative/ Security and Inadequacy) and retained only the remaining four factors in their analysis (Obsession, Retention, Spend and Effort). Again, judging from content validity, the factor labelled "obsession" comes closest to the concept we are interested in and consists of 9 items in their revised version. We will discuss this subscale in more detail in Section 3.

There are two further suggestions dealing with the measurement of money attitudes. One stems from Tang (1992, 1993, 1995), the other from Mitchell and Mickel (1999) (see also Mickel et al., 2003). Tang's approach aims at measuring ethical aspects of money. Accordingly, the scale is called the Money Ethics Scale (MES). There is a long version consisting of 30 items with 6 factors called "good", "evil", "achievement", "respect", "budget", and "freedom". The shorter version consists of 12 items with three dimensions called "success", "budget", and "evil". A typical item of the first dimension is "Money is a symbol of success". The "budget" factor is represented by the item "I budget my money very well", and the "evil" factor by the item "Money is the root of all evil".

The scale by Mitchell and Mickel (1999) is called Money Importance Scale (MIS) and has 7 factors consisting of 3 to 6 items each (32 items overall). The factors are called "value importance of money", "personal involvement with money", "time spent thinking about financial affairs", "knowledge of financial affairs", "comfort at taking financial risks", "skill at handling money", and "money as a source of power and status". As can be seen from the labels of the different factors the scale partly overlaps with the suggestion by Furnham (1984) or Wilhelm et al. (1993). The scale owes its name to the first factor which consists of the following 4 items: "I believe that the more money you have the happier you are", "I value money very highly", "Money is important", and "I daydream about being rich". Two of the items are also contained in Tang's Money Ethics Scale ("I value money very highly", and "Money is important") (Mickel et al., 2003).

The suggested scales are doubtlessly valuable contributions to the literature. However, they also have a number of drawbacks. First, the scales are relatively complicated. They consist of a large number of items, which makes it more difficult to integrate them into general surveys. Also, they are multidimensional, measuring various attitudes related to money. However, only one of the subscales included in the MIS of Mitchell and Mickel (1999) refers to the importance of money. This subscale has only four items and two of them have a somewhat doubtful wording. This refers to the item "Money is important" and to the item "I daydream about being rich". The statement "money is important" can also get agreement from respondents who do not value money for themselves but think that money is important for others or for the economy in general. The item "I daydream about being rich" is also not beyond doubt. Does it only refer to poor people? At least disagreement with the statement seems possible for respondents who believe that they are rich and appreciate it, since they might not daydream about it anymore. Mickel et al. (2003) report a Cronbach's alpha of 0.71 for this subscale which suggests that the correlation among the four items is high. However, a Cronbach's alpha of 0.71 indicates that there is some room for improvement. Second, the existing scales have only been rudimentarily tested so far. The existing tests are restricted to factor analyses and the calculation of Cronbach's alpha, but the scales have not been scrutinized thoroughly with respect to their comparative construct validity or external validity.

## 3. Study 1

### 3.1. Material and methods

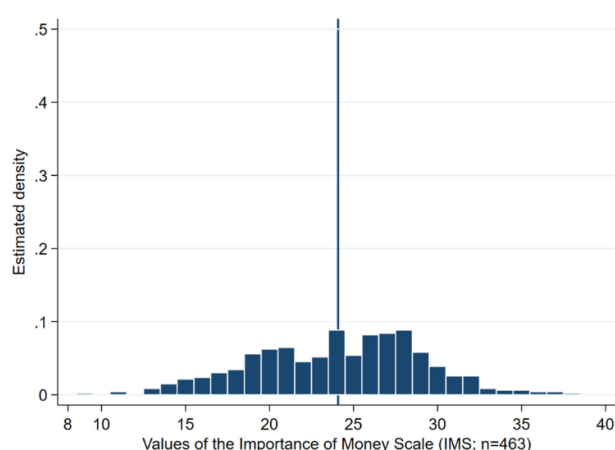
The concept we want to measure is best described by the importance of material well-being. It is closely related to the importance of money



**Table 1**  
The Importance of Money Scale (IMS; wave 1 only).

	IMS
(1) Material wealth is important for me.	0.78
(2) Money is important for me.	0.77
(3) Money makes me happy.	0.76
(4) Financial security is important for my well-being.	0.67
(5) If in doubt, I prefer to have more rather than less money.	0.61
(6) One can only have a decent life with a lot of money.	0.61
(7) I enjoy material things.	0.53
(8) To make more money, I would work more immediately.	0.51
N	463
Cronbach's $\alpha$	0.81
Importance of Money Scale: mean	24.08
sd	5.03
min, max	9, 38

Note: Numbers indicate factor loadings after varimax-rotated principal component factor analysis. Each item contains five answer categories ranging from 1 = "disagree strongly" to 5 = "agree strongly".



**Fig. 1.** Frequency distribution of the Importance of Money Scale (IMS; wave 1 only). Note: mean, median, and mode = 24.

since material or physical well-being can only be gained through the possession of money in modern societies. Hence, we use both concepts, the importance of money and the importance of material well-being, interchangeably. This is what Adam Smith (1776) had in mind when writing about material well-being as a fundamental motivator of human behavior. However, the importance individuals ascribe to material well-being or money can differ. Some people are happy if they reach a minimum of material well-being, others strive for lots of it and enjoy or gain satisfaction from material things. To measure the importance individuals ascribe to material well-being or money, we came up with 8 items depicted in Table 1. The instrument we suggest is related to the subscale "value importance of money" by Mitchell and Mickel (1999). Two items are actually similar to their suggestion. These are the items "Money is important for me", and "Money makes me happy". But the other 6 items are new and differ from the existing scales. Particularly, the scale consists of items that do not solely refer to money but explicitly to material-wellbeing, like "I enjoy material things" or "material well-being is important for me".

To test the measurement characteristics of the scale we followed the multitrait-multimethod approach suggested by Campbell and Fiske (1959). The basic idea of Campbell and Fiske (1959) is that the measurement qualities of an instrument can only be assessed if the instrument is used repeatedly with different methods (multimethod), and if the instrument is compared to a closely related alternative (multitrait).

We chose self-administered online questionnaires and face-to-face interviews as the two different methods. The second trait we used is the obsession subscale of Wilhelm et al. (1993), because this subscale is contained in many former suggestions to measure the attitudes towards money, similar in content, and similar in length.

For the purpose to test the scale we drew a random sample of 510 students from the University of Bern, Switzerland. Participants were randomized into four groups. All participants were interviewed twice within 4 weeks between April and June 2020. Group one ( $N = 182$ ) twice received an online questionnaire (CASI), group two ( $N = 108$ ) conducted the first interview online and the second face-to-face, group 3 ( $N = 83$ ) conducted the first interview face-to-face and the second online, and in group 4 ( $N = 90$ ) both interviews were conducted face-to-face. Both questionnaires contained about 50 questions and the mean interview time was about 25 min. All participants received 20 Swiss Francs (about US \$20) after completion of the second interview. The response rate in group one was much higher than in the other three groups since the online interviews could be easily conducted from home while the face-to-face interviews required participants to meet the interviewers on the University's campus.

To check whether participants devoted sufficient attention to the online questionnaire it contained a fake question asking the participant not to tick any answering categories. Twenty cases did nonetheless tick an answer suggesting that they did not pay good attention. These cases were excluded from the analysis. We also excluded 22 cases because they had an unrealistic response time of below 10 min. Furthermore, 5 subjects were dropped from the data because they reported being older than 40. Therefore, we ended up with a sample of 463 valid cases. However, our results do not depend on these exclusions. Each of the 8 items intended to measure the importance of money was accompanied by a five-point Likert response scale ranging from (1) "disagree strongly" to (5) "agree strongly".

### 3.2. Results

An exploratory factor analysis reveals that all items load on a single factor which explains 45% of the items' variance (see Table 1). The highest factor loading of 0.78 is observed for the item "Material wealth is important for me", followed by "Money is important for me" and "Money makes me happy". This result confirms the assumption that the importance of material well-being and the importance of money are very similar concepts and measure basically the same. Moreover, the additive index of all 8 items reaches high reliability as indicated by a Cronbach's alpha of 0.81.

Fig. 1 displays the frequency distribution of the scale. The distribution is almost normal with a mean, median, and mode of 24. More importantly, the scale produces a large variance without fat tails ( $sd = 5$ ). As a matter of fact, none of our respondents reached the scale's minimum of 8, or the scale's maximum of 40. This suggests that the scale was able to pick up the entire variance present in our sample.

As a comparative instrument, the second trait, we use the Money Obsession Scale suggested by Wilhelm et al. (1993). The scale has a number of features that suggest that it should be an appropriate comparison: It was designed to measure the importance of money, has similar length (9 items), and uses also 5-point Likert type answering categories. The 9 items are displayed in Table 2. An exploratory factor analysis extracts 3 factors that explain 23%, 16%, and 16% respectively of the items' variance. The additive index produces only a moderate reliability as indicated by Cronbach's alpha of 0.65. The distribution of the Money Obsession Scale is depicted in Fig. 2. As can be seen the distribution is right-hand skewed (mean = 13, median = 12, mode = 9) with many observations clustering at the lower end. Also, the scale has a much lower variance ( $sd = 3.47$ ).

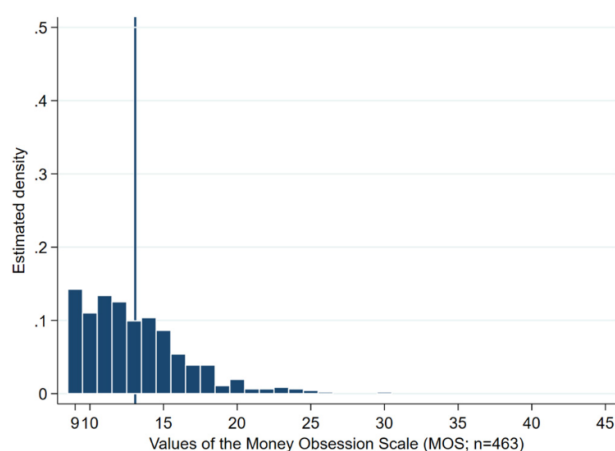
Next the results of a simple multitrait-multimethod matrix are presented, in Table 3. First the cells of the diagonal of the table present the test-retest reliabilities. The Importance of Money (IMS) scale resulted in

**Table 2**

The Money Obsession Scale (MOS) (Wilhelm et al., 1993; wave 1 only).

			MOS
I	(1)	I firmly believe that money can solve all of my problems.	0.71
	(2)	I believe that time not spent on making money is wasted time.	0.77
	(3)	I feel that money is the only thing I can really count on.	0.76
	(4)	I would do practically anything legal for money if it were enough.	0.43
II	(5)	Compared to most other people I know, I believe that I think about money much more than they do.	0.52
	(6)	I sometimes feel superior to those who have less money than I do regardless of their ability and achievements.	0.61
	(7)	I am proud of my financial victories – pay, riches, investments, etc. – and let my friends know about them.	0.82
III	(8)	I sometimes “buy” friendship by being very generous with those I want to like me.	0.81
	(9)	I often use money as a weapon to control or intimidate those who frustrate me.	0.82
N			463
Cronbach's $\alpha$			0.65
Money Obsession Scale: mean			13.08
SD			3.47
min, max			9, 30

Note: Numbers indicate factor loadings after varimax-rotated principal component factor analysis. Each item contains five answer categories ranging from 1 = “disagree strongly” to 5 = “agree strongly”.



**Fig. 2.** Frequency distribution of the Money Obsession Scale (Wilhelm et al., 1993; wave 1 only). Note: mean = 13, median = 12, Mode = 9.

**Table 3**

Multitrait-Multimethod Matrix.

Method	Construct	Online		Personal	
		IMS	MOS	IMS	MOS
Online	IMS	(0.80***)			
	MOS	0.61***	(0.68***)		
Personal	IMS	0.78***	0.53***	(0.89***)	
	MOS	0.51***	0.70***	0.50***	(0.69***)

Note:  $n(CV)_{O1,P2} = 108$ ,  $n(CV)_{P1,O2} = 83$ ,  $n(TRR)_{O1,O2} = 182$ ,  $n(TRR)_{P1,P2} = 90$ . CV = construct validity, TRR = test-retest reliability. \*\*\*  $p < 0.001$ .

test-retest correlations of 0.80 when the survey was conducted online in both waves, and of 0.89 when the interviews were conducted face-to-face in both waves. The respective correlations of the Money Obsession Scale (MOS) are only 0.68 and 0.69. Next, the convergent validity is indicated by the correlation of the same trait measured with different methods. For the IMS this correlation is 0.78, and for the MOS 0.70. Discriminant validity is indicated by the correlations of different traits but same methods. These correlations are 0.61 if both traits are administered online, and 0.50 if both traits are measured via face-to-face interviewing. An instrument (trait) has high construct validity if the

correlation indicating convergent validity is high, and if the correlations indicating discriminant validity are comparably low. These criteria are clearly fulfilled meaning that the IMS has high convergent validity and also high discriminant validity. As a matter of fact its convergent validity is higher as compared to the MOS.

The matrix also suggests that both scales are related but the correlations are modest, 0.61 in case of online surveying and 0.50 in case of face-to-face interviewing. The multitrait-multimethod approach can also be analysed via confirmatory factor analysis using structural equation modelling (SEM). The structure of such a model is presented in Fig. A1 in the appendix. The model's logic accounts for the fact that the variance of the items can be produced by the latent trait variable and by the latent method variable (Eid & Diener, 2006; Höfling et al., 2009; Maas et al., 2009). Convergent validity is given if the trait loadings of the items are higher than the method loadings. The results of such an estimation are presented in Table A1 of the appendix. For the IMS it can be seen that all factor loadings of the latent trait variable are statistically significant and higher than the method loadings, suggesting high convergent validity. This is not always the case for the MOS. Here some items are not represented by the trait (statistically non-significant factor loadings) and some method loadings for item 1, 6, 7 and 8 are higher than the trait loadings. Hence, the results of a structural equation model using confirmatory factor analysis confirms the results of the simpler multitrait-multimethod matrix.

Measurement instruments should not only have high reliability and high convergent validity but they should also have external and predictive validity, that is, showing theoretically expected correlations with other constructs or predicting behavior. For this purpose we included a number of suitable alternative constructs as well as one incentivized behavioral measure in the survey. One of the constructs we included is environmental concern as suggested in environmental research (see Franzen & Mader, 2021; Franzen & Meyer, 2010; Franzen & Vogl, 2013). Individuals for whom money or material well-being is important are expected to show lower concern for the environment. Furthermore, we included two questions that refer to reported behavior. One is “I sometimes buy things that I do not need”. Individuals for whom material well-being is important should report this to be the case more often. A further item was related to labor market behavior and reads “I would prefer a job with more money over a job with more fun”. Also, here the hypothesis is that individuals for whom money is important should more often prefer better paid jobs. Finally, the questionnaire provided participants with the possibility to donate some (or all) of their monetary compensation for participation to a welfare organization. The question



**Table 4**  
The external validity of IMS and MOS.

	(1)	(2)	(3)	(4)	(5)
Dependent variable	Environmental Concern (ISSP9) (z-stand.)	Would prefer a job with more money over fun (z-stand.)	Buy things I do not need (z-stand.)	Donation (dummy)	Donation (amount)
Model	OLS	OLS	OLS	Logit	NB
Effect	ME	ME	ME	AME	AME
Wave	1	1	1	2	2
IMS (z-standardized)	−0.36*** (0.04)	0.42*** (0.04)	0.30*** (0.05)	−0.11*** (0.02)	−2.02*** (0.51)
MOS (z-standardized)	−0.29*** (0.05)	0.36*** (0.05)	0.07 (0.06)	−0.09*** (0.02)	−2.00*** (0.53)
$p(\chi^2(\text{diff. in } \beta))$	0.08	0.18	0.00	0.39	0.96
n	445	448	448	448	448

Note: Regressions of validation instruments on the Importance of Money Scale (IMS) and the Money Obsession Scale (MOS). Depicted are z-standardized coefficients with 95% confidence intervals of robust standard errors including either one of the central independent variables IMS or MOS. Each of the models controls for sex, age, country of birth, educational background, number of semesters enrolled, and survey mode (see Table A2 for a detailed description of the variables). The measurements of the independent variables stem from the same wave as the dependent variables. OLS = ordinary least squares; NB = negative binomial; (A)ME = (average) marginal effect. \*\*\*  $p < 0.001$ .

was twofold, asking first whether respondents wanted to donate at all (yes/no), and second, in the case of those agreeing to donate, how much they wanted to donate. Clearly, participants who value money more should donate less often and if they donate, should donate less as compared to those with a lower evaluation of money. The test of external validity consists of five regressions displayed in Table 4.

All regressions depicted in Table 4 control for respondents' sex, age, country of birth, educational background, number of semesters enrolled, and survey mode. The results of Table 4 refer only to the effect of IMS, and in a separate model, of MOS on the five different dependent variables. As can be seen, the effects of IMS on environmental concern, preferring money over fun in job choice, buying things even if they are not needed and donation behavior all show statistical significance in the expected direction. Respondents who value money show less environmental concern. The effect suggests that a one standard deviation increase in monetary orientation decreases environmental concern by 0.36 standard deviations. The effect on preferring jobs with better pay and buying things that are not necessary are as expected positive. Finally, respondents with high values on the Importance of Money Scale did as expected donate less often to a charitable organization (−0.11, or eleven percentage points) or, alternatively, donate 2 Swiss Francs less as compared to respondents with a lower monetary orientation. Hence, the evidence presented here indicates that the IMS has good external validity. The second row of Table 4 presents the same analysis for the MOS. As can be seen also the MOS is related to all five dependent variables in the expected direction. However, the effect sizes are always a little bit lower as compared to IMS. Furthermore, this pattern is confirmed by an analysis of measuring the IMS and MOS in the first wave and regressing it on the dependent variables as measured in the second wave, indicating predictive validity (see Table A3).

Finally, measurement instruments should not be sensitive to social desirability. To test the scales' sensitivity to social desirability we used a short 10-item version of the Crowne-Marlowe (CM) scale (Crowne & Marlowe, 1960, 1964) as suggested by Clancy (1971) (see Franzen and Mader (2019) for a test of the CM scale). For this purpose, we ran two separate OLS regressions, one with IMS as the dependent variable, the other with MOS as the dependent variable, and with the CM scale as the independent variable (together with socio-demographic control variables). In both models (see Table A4) the CM scale had no statistically significant effect on the IMS or MOS, suggesting that the scales are not sensitive towards social desirability.

## 4. Study 2

### 4.1. Material and methods

So far, all tests of the IMS presented were conducted using a student sample. To test if the scale displays similar characteristics in a random population sample, we incorporated the IMS into the follow-up survey of the study "Measurement and Observation of Social Attitudes in Switzerland (MOSAICH) 2020 conducted by the Swiss Centre of Expertise in the Social Sciences (FORS) (Ernst Stähli et al., 2021). The follow-up of the MOSAICH 2020 was conducted via a push-to-web survey in a random sample of the Swiss population consisting of 3166 self-administered interviews in 2020.

### 4.2. Results

The results of the exploratory principal component factor analysis are presented in Table 5. Unfortunately, item 5 of the original IMS was dropped in the random population sample. However, the remaining 7 items load in a similar way on a single factor which explains 47% of the items' variance, and shows again high internal consistency as indicated by Cronbach's alpha of 0.80. Also, the scale displays again a normal distribution (Fig. A2) with similar mean and variance as was already obtained in the student sample. The standardized mean and variance (standardized by the number of items) is 3 and 0.63 respectively in both samples. The scale has flat tails and seems to capture the entire variance in the population.

The main part of the MOSAICH 2020 contains the questionnaire module of the International Social Survey Programme (ISSP) 2020 on Environment. Therefore, the survey contains some variables that allow tests of the external validity of the IMS. Particularly, the survey contains the environmental concern scale we used also in the student sample, an item about consumption behavior ("In the past 12 month, have you consumed less altogether for political, ethical or ecological reasons?"), and a question on whether participants donated some money to an environmental organization in the past five years.

Furthermore, participants of the MOSAICH 2020 had also the possibility to donate their participation endowment of 10 Swiss Francs to a pro-environmental or charitable organization of their choice. Regressing the IMS on these four dependent variables shows (Table 6) that it is related to environmental attitudes, self-reported behavior and actual incentivized donation behavior in the expected ways. Particularly, participants with higher values of the IMS show lower environmental

**Table 5**

The Importance of Money Scale (IMS), results from random population survey.

		Student sample (MTMM, wave 1)	Random sample (MOSAICH 2020)
(1)	Money is important for me.	0.77	0.75
(2)	Money makes me happy.	0.76	0.73
(3)	I enjoy material things.	0.53	0.68
(4)	To make more money, I would work more immediately.	0.51	0.58
(5)	If in doubt, I prefer to have more than less money.	0.61	n.a.
(6)	Financial security is important for my wellbeing.	0.67	0.64
(7)	Material wealth is important for me.	0.78	0.76
(8)	One can only have a decent life with a lot of money.	0.61	0.62
N		463	2914
Cronbach's $\alpha$		0.81	0.80
Importance of Money Scale: mean		24.08 (3.01)	21.00 (3.00)
sd		5.03 (0.63)	4.41 (0.63)
min, max		9, 38 (1.13,4.75)	7, 35 (1, 5)

Note: Numbers indicate factor loadings after varimax-rotated principal component factor analysis. Each item contains five answer categories ranging from 1 = "strongly disagree" to 5 = "strongly agree". For some reason FORS decided not to include Item 5 in MOSAICH 2020. Descriptives in parentheses are standardized by the number of items of the additive index.

**Table 6**

The external validity of the adapted Importance of Money Scale (IMS) in the random sample (MOSAICH 2020).

	(1)	(2)	(3)	(4)
Dependent variable	Environmental Concern (ISSP9) (z-stand.)	Consumed less for political, ethical or environmental reasons last year (dummy)	Self-reported donation to environmental organization last 5 years (dummy)	Donation (dummy)
Model	OLS	Logit	Logit	Logit
Effect	ME	AME	AME	AME
Adapted IMS (z-stand.)	−0.31*** (0.02)	−0.07*** (0.01)	−0.06*** (0.01)	−0.04** (0.01)
n	2217	2320	2430	1147

Note: Regressions of validation instruments on the adapted Importance of Money Scale (IMS). Depicted are z-standardized coefficients with 95% confidence intervals of robust standard errors. Each of the models controls for sex, age, country of birth, and education. OLS = ordinary least squares; (A)ME = (average) marginal effect. \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

attitudes (−0.31 sd), report not to consume less for ethical, political or environmental reasons (−7% points) donated less money to environmental organizations in the last five years (−6% points), and also donated less often their endowment to a charitable organization (−4% points). Overall, these results suggest that the IMS has high external validity, and mirrors the results obtained with the student sample very closely.

## 5. Discussion

In this paper we suggest a new 8-item scale to measure the importance of money (IMS) and conduct tests of reliability, construct validity, external validity, and predictive validity. Factor analysis (both exploratory and confirmatory) suggests that the scale is one-dimensional. The scale has a high test-retest reliability of 0.80, and a Cronbach's alpha of 0.81. Furthermore, we compare the scale with an alternative instrument, the money obsession scale (MOS) in the version of Wilhelm et al. (1993), by using a multitrait-multimethod approach. The results show that the IMS has high convergent validity as well as high discriminant validity. We also demonstrate the scale's external and predictive validity by investigating its relation to environmental concern, self-reported labor market choice, consumption behavior, and observed donation behavior. All these tests suggest that the IMS performs very well. In particular, it has higher reliability and higher validity than the comparative instrument, the Money Obsession Scale, and it also shows better external

validity by being more strongly related to environmental concern, labor market choice, and self-reported consumption behavior. Furthermore, the IMS as measured in the first wave of the survey, predicts the donation behavior observed in the second wave better than the MOS does. Moreover, the scale is not sensitive to socially desirable answering behavior. Hence, the new scale outperforms the Money Obsession Scale in almost every respect we tested here.

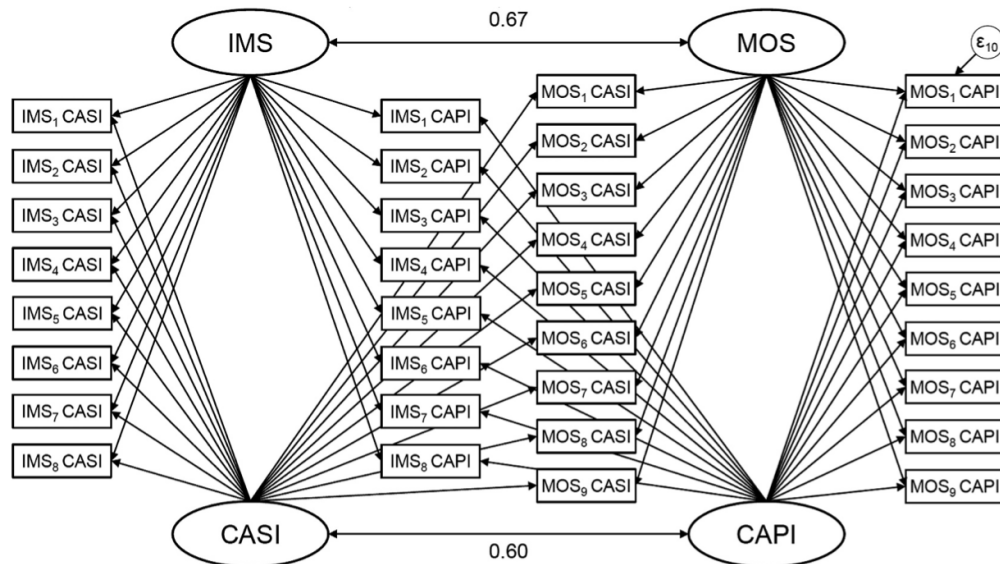
We also integrated a reduced version (7 items) of the IMS into a random sample of the Swiss population with about 3000 participants. The results confirm that the IMS has high reliability and high external validity. Particularly, respondents with higher values of IMS display lower pro-environmental attitudes, report to refrain less often from consumptive behavior and donate less often to charitable organizations. Hence, we believe that the IMS makes a valuable contribution to the literature, particularly, since material wellbeing is an important motivator of human behavior which is relevant in many social domains.

However, our study has also some limitations. Particularly, we tested the scale only in one country, Switzerland, and further research should show that the scale has also measurement invariance and can also be used in other countries.

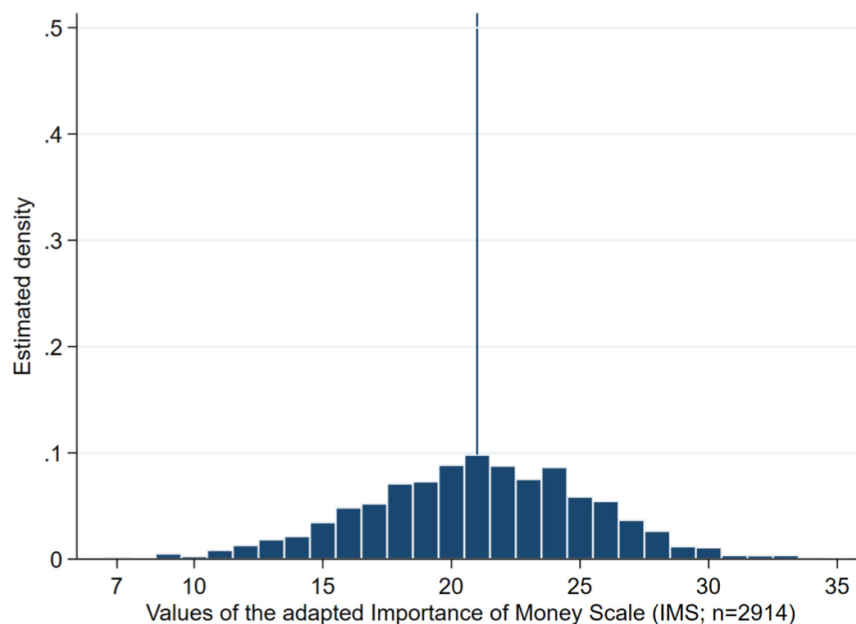
## CRedit authorship contribution statement

Both authors contributed equally to the manuscript.

## Appendix A



**Fig. A1.** Structural Equation Model (SEM) of the Confirmatory Factor Analysis of the Multitrait-Multimethod Matrix (CFA-MTMM) for IMS and MOS. Note: All measurements have an error term  $\epsilon$ . For ease of presentation, only  $\epsilon_{10}$  of MOS<sub>1</sub>-CAPI is depicted. The detailed results can be obtained from Table A1 of the Appendix. IMS = Importance of Money Scale; MOS = Money Obsession Scale; CASI = computer-assisted self-interview; CAPI = computer-assisted personal interview.



**Fig. A2.** Frequency distribution of the adapted Importance of Money Scale (IMS) in the random sample (MOSAICH 2020). Note: The adapted version of the IMS only includes seven of the eight items of the original IMS (see Table 1). For some reason FORS decided not to include Item 5 in MOSAICH 2020.

**Table A1**  
SEM of CFA-MTMM.

Items	Trait Loading (Convergent Validity)	Method Loading
<b>IMS<sub>1</sub>-CASI</b>	0.60 (0.17)**	0.34 (0.08)***
<b>IMS<sub>1</sub>-CAPI</b>	0.70 (0.21)**	0.20 (0.09)*
<b>IMS<sub>2</sub>-CASI</b>	0.81 (0.25)**	0.30 (0.10)**
<b>IMS<sub>2</sub>-CAPI</b>	0.63 (0.19)**	0.29 (0.08)**
<b>IMS<sub>3</sub>-CASI</b>	0.45 (0.15)**	0.27 (0.09)**
<b>IMS<sub>3</sub>-CAPI</b>	0.26 (0.13)*	0.16 (0.07)*
<b>IMS<sub>4</sub>-CASI</b>	0.59 (0.19)**	0.11 (0.09)
<b>IMS<sub>4</sub>-CAPI</b>	0.57 (0.20)**	0.19 (0.08)*
<b>IMS<sub>5</sub>-CASI</b>	0.31 (0.14)*	0.09 (0.10)
<b>IMS<sub>5</sub>-CAPI</b>	0.27 (0.13)*	0.12 (0.07)
<b>IMS<sub>6</sub>-CASI</b>	0.44 (0.16)**	0.15 (0.10)
<b>IMS<sub>6</sub>-CAPI</b>	0.38 (0.17)*	0.07 (0.07)
<b>IMS<sub>7</sub>-CASI</b>	0.74 (0.22)**	0.26 (0.10)*
<b>IMS<sub>7</sub>-CAPI</b>	0.66 (0.22)**	0.14 (0.07)
<b>IMS<sub>8</sub>-CASI</b>	0.96 (0.30)**	0.12 (0.11)
<b>IMS<sub>8</sub>-CAPI</b>	0.86 (0.28)**	0.11 (0.08)
<b>MOS<sub>1</sub>-CASI</b>	0.66 (0.07)***	0.02 (0.15)
<b>MOS<sub>1</sub>-CAPI</b>	0.42 (0.10)***	0.53 (0.16)**
<b>MOS<sub>2</sub>-CASI</b>	0.57 (0.07)***	0.17 (0.12)
<b>MOS<sub>2</sub>-CAPI</b>	0.42 (0.08)***	0.40 (0.14)**
<b>MOS<sub>3</sub>-CASI</b>	0.68 (0.07)***	0.08 (0.13)
<b>MOS<sub>3</sub>-CAPI</b>	0.57 (0.07)***	0.00 (0.16)
<b>MOS<sub>4</sub>-CASI</b>	0.44 (0.08)***	0.27 (0.09)**
<b>MOS<sub>4</sub>-CAPI</b>	0.35 (0.08)***	0.19 (0.14)
<b>MOS<sub>5</sub>-CASI</b>	0.48 (0.08)***	0.21 (0.11)*
<b>MOS<sub>5</sub>-CAPI</b>	0.42 (0.09)***	0.20 (0.17)
<b>MOS<sub>6</sub>-CASI</b>	0.37 (0.10)***	0.58 (0.09)***
<b>MOS<sub>6</sub>-CAPI</b>	0.29 (0.09)**	0.44 (0.18)*
<b>MOS<sub>7</sub>-CASI</b>	0.23 (0.11)*	0.18 (0.20)
<b>MOS<sub>7</sub>-CAPI</b>	0.03 (0.12)	0.83 (0.19)***
<b>MOS<sub>8</sub>-CASI</b>	0.33 (0.11)**	0.14 (0.20)
<b>MOS<sub>8</sub>-CAPI</b>	0.15 (0.10)	0.35 (0.16)*
<b>MOS<sub>9</sub>-CASI</b>	0.29 (0.10)**	0.05 (0.19)
<b>MOS<sub>9</sub>-CAPI</b>	0.25 (0.08)**	0.22 (0.16)
Covariance (IMS, MOS) (Discriminant Validity):		0.67
Covariance (CASI, CAPI):		0.60
Model Fit:		
$\chi^2$ -Test (model vs. saturated):		$\chi^2(266) = 282.26, p = 0.24$
Root mean squared error of approximation (RMSEA)		0.02 (90 %-CI: [0.00, 0.04]), p=1
Comparative Fit Index (CFI)		0.99

Note: Factor loadings are standardized regression loadings. Numbers in parentheses represent standard errors. The variances of all latent constructs are set to one. All measurement errors of the same trait are allowed to covary. Items in bold indicate high levels of relative convergent validity (trait loadings > method loadings). \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

**Table A2**

Description of variables for validation analyses.

Variable	Description	Wave 1			
		Mean	SD	Min., max.	n
Environmental Concern (ISSP9)	Sum index of 9 items. Each item ranges from 1 = "disagree strongly" to 5 "agree strongly" (Franzen and Meyer 2010, Franzen and Vogl 2013). Cronbach's $\alpha = 0.81$ .	34.87	5.35	14, 45	460
Would prefer a job with more money over fun	Likert scale ranging from 1 = "disagree strongly" to 5 "agree strongly".	1.93	0.91	1, 5	463
Buy things I do not need	Likert scale ranging from 1 = "disagree strongly" to 5 "agree strongly".	2.29	1.04	1, 5	463
Donation	Dummy. Wave 2 only.	0.59		0, 1	463
Donation	Amount in CHF. Wave 2 only.	8.34	8.38	0, 20	463
Crowne Marlowe Social Desirability Scale (CM; Crowne and Marlowe 1960)	Sum index of socially desirable answers to 10 items with each being rated either true or false (Clancy 1971). Cronbach's $\alpha = 0.61$ .	6.12	1.85	0, 10	463
Sex: female	Dummy.	0.64		0, 1	463
Age	In years.	24.22	3.29	19, 40	463
Country of birth: Switzerland	Dummy.	0.89		0, 1	463
Education of mother	Categorized school achievement: 1="primary", 2="secondary", 3="tertiary" education completed.	1: 0.04 2: 0.47 3: 0.45		0, 1 0, 1 0, 1	456 456 456
Education of father		1: 0.04 2: 0.42 3: 0.54		0, 1 0, 1 0, 1	452 452 452
Number of semesters enrolled		4.76	2.93	1, 15	463
Survey mode: online	Dummy.	0.63		0, 1	463



**Table A3**  
The predictive validity of IMS and MOS.

	(1)	(2)	(3)
Dependent variable	Environmental Concern (ISSP9) (z-standardized)	Donation (dummy)	Donation (amount)
Model	OLS	Logit	NB
Effect	ME	AME	AME
Wave	2	2	2
IMS (z-standardized)	−0.38*** (0.05)	−0.09*** (0.02)	−1.98*** (0.53)
MOS (z-standardized)	−0.27*** (0.05)	−0.07** (0.02)	−1.87*** (0.50)
$p(\chi^2(\beta_{IMS} - \beta_{MOS}))$	0.02	0.43	0.83
n	445	448	448

Note: Regressions of validation instruments on the Importance of Money Scale (IMS) and the Money Obsession Scale (MOS). Depicted are z-standardized coefficients with 95% confidence intervals of robust standard errors including either one of the central independent variables IMS or MOS. The independent variables are measured in wave 1. OLS = ordinary least squares; NB = negative binomial; (A)ME = (average) marginal effect. The variables are described in Table A2. \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

**Table A4**  
The sensitivity towards social desirability of IMS and MOS.

	(1)	(2)
Dependent variable	IMS (z-standardized)	MOS (z-standardized)
Model	OLS	OLS
Wave	1	1
Crowne Marlowe Social Desirability Scale (CM)	−0.04 (0.02)	−0.05 (0.03)
$p(\chi^2(\beta_{CM}))$	0.72	
n	448	448

Note: Regressions of the Importance of Money Scale (IMS) and the Money Obsession Scale (MOS) on CM. Depicted are z-standardized coefficients with 95% confidence intervals of robust standard errors. The measurements of the independent variables stem from the same wave as the dependent variables. The variables are described in Table A2.

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