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# Validating the FIBER scale to measure family firm heterogeneity – A replication study with extensions

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A B S T R A C T

The number of studies referencing socioemotional wealth (SEW) stands in stark contrast to the number of papers actually employing direct and multidimensional measures of SEW. Despite the FIBER scale reaching its tenth anniversary, and despite a preliminary validation by Hauck et al. (2016), the direct measurement of SEW has nevertheless been met with remarkable conservatism. This is counterintuitive, given the frequent demand for a validated, direct, and multidimensional SEW scale of practical length. In this paper we replicate and extend the first validation of the FIBER scale, undertaken by Hauck et al. (2016). Our results offer an improved (short) scale that is validated with psychometric rigor (N = 1019) and demonstrates generalizability.

## 1. Introduction

The concept of socioemotional wealth (SEW), first introduced by Gómez-Mejía and colleagues in 2007, is often described as "one of the most important developments during this time period" (Brigham & Payne, 2019, p. 326). Nearly 2000 studies have referred to the concept of SEW, making it one of the most frequently cited concepts in family business research (Gomez-Mejia et al., 2007; Odom, Chang, Chrisman, Sharma & Steier, 2019). Based on the theoretical tenets of prospect and behavioral agency theories (Wiseman & Gomez-Mejia, 1998), the concept describes the pursuit of noneconomic goals and, thus, the family's affective needs, such as identity, influence, and perpetuation of the family dynasty (Gomez-Mejia,Takács Haynes, Núñez-Nickel, & Jacobson, 2007). It has been argued that SEW is a unique factor that differentiates family firms from non-family firms, as well as explaining the heterogeneity of family firms (Berrone et al., 2012; Deephouse & Jaskiewicz, 2013; Holt, Pearson, Carr & Barnett, 2016; Naldi & Gomez-Mejia, 2013), since it may serve as the reference point for decision-makers (Nason, Mazzelli, & Carney; Zellweger & Dehlen, 2012), therefore influencing strategic decision-making with respect to the preservation or enhancement of existing endowments (Berrone, Cruz, & Gomez-Mejia, 2012).

Hauck, Suess-Reyes, Beck, Prügl, and Frank (2016) were the first and, so far, only authors to validate a scale that conformed with the original conceptualization and theoretical underpinning provided by Berrone et al. (2012) and Wiseman & Gomez-Mejia (1998). Their results led to a nine-item scale, based on a sample of 216 family-owned and family-managed firms in German-speaking areas. This scale, called REI, takes into account three dimensions of the original concept: *identification of family members with the firm* (I), *emotional attachment* (E), and *renewal of family bonds to the firm through dynastic succession* (R) (Berrone et al., 2012; Hauck et al., 2016). The FIBER validation by Hauck et al. (2016) was timely and well received by the family business field. The paper accrued over 100 citations in less than five years, and not only coincided with, but also amplified the drive to measure SEW directly and in a differentiated way, in order to investigate family firm heterogeneity.

In our replication and extension study, we replicate the first validation by Hauck et al. (2016), in order to further validate the psychometric properties of the original FIBER scale for use in family business research. We base the validation procedure in this paper on six separate samples, following the call by Hauck et al. (2016) to revalidate their study, by addressing multiple dimensions of family firm heterogeneity based on different samples. The characteristics of our datasets allow us to extend the validation of Hauck et al. (2016) to large family firms with more than 500 employees. This is an important extension of the scale's validation, as many family firms worldwide are large firms; see, for example, those companies in the Global Family Business Index 2021, which employ up to 2.3 million people. As well as variation in size, our samples vary in firm age, TMT-composition and cultural and national context; they thereby cover all the aspects requiring revalidation, as

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identified by Hauck et al. (2016). We are able to demonstrate the applicability of the validated scale in a variety of cultural contexts, including Europe, the US, and Asia. Alongside this, we also address concerns about limitations regarding possible sample biases (Debicki, Kellermanns, Chrisman, Pearson & Spencer, 2016; Hauck et al., 2016). This could help towards alleviating uncertainties about which dimensions of the FIBER scale should be integrated into a given empirical design, and how precisely these should be measured.

Our empirical validation offers three distinct contributions, beyond what has already been accomplished by Hauck and colleagues (2016). The first of these is a replication of Hauck et al. (2016), with improved generalizability over more heterogeneous populations of family firms, as suggested by Hauck et al. (2016) themselves. Second, we are able to revalidate Hauck et al. (2016) in a psychometrically sound manner, as our combined sample size adds up to 1019 questionnaire responses; this allows us to use a first sample ($N = 353$) for factor extraction, a second sample ($N = 370$), for confirmatory results, and to reserve a third sample ($N = 296$) for robustness tests. The subsamples are well within the required range for validation studies (Guadagnoli & Velicer, 1988; MacCallum et al., 1999; Mundfrom et al., 2005). From a methodological viewpoint, we provide a comprehensive, sound data analysis strategy to test the psychometric properties of the scale. This includes all required criteria regarding the reliability as well as content validity, construct validity, and criterion-related validity of the scale (Churchill, 1979; Price, 2016). By following these practices, we are able to provide evidence for the psychometric soundness of the scale. Last, we present a validated short version of the FIBER measurement. In doing so, we address the problem of the constantly diminishing response rates in social science and management research surveys, which are a result of survey fatigue (Prügl, 2019). Although concisely presented scales capture attributes of interest to the researcher, various challenges have been identified in the use of lengthy multi-item instruments, such as non-response, demand effects, or second-guessing of the underlying hypotheses (Diamantopoulos & Winklhofer, 2001; Stanton, Sinar, Balzer & Smith, 2002). Our reliable, valid, short measure of SEW enables researchers and practitioners to facilitate the evaluation of initiatives designed to explore the heterogeneity of family firms.

### 1.1. Theoretical background

Berrone et al. (2012) were the first to introduce a multidimensional measure of SEW in family business research, termed 'FIBER', which was a signficant and necessary first step towards addressing the multidimensional nature of SEW. To this end, they developed 27 items, based on previous research and surveys in the field of organizational identity, family business commitment, and transgenerational control (Berrone et al., 2012). Although an important step towards refining the SEW construct, and making it more accessible for empirical research, until 2017 SEW nevertheless remained one of the least measured constructs, as researchers struggled to establish the FIBER scale as a multidimensional measurement for SEW (Brigham & Payne, 2019).

A recent overview by Swab, Sherlock, Markin, and Dibrell (2020) found that 82 papers focusing on one or more elements of the FIBER scale had been published between 2014 and 2017. Based on an individual review of each of those papers identified by Swab et al. (2020), which were published before the release of the REI validation of Hauck et al. (2016), it would seem remarkable that not one single paper directly measures SEW using the FIBER scale. The vast majority of studies are qualitative, relying on archival data or using rudimentary and unidimensional proxy measures, such as family control, family generation (e.g., Gottardo & Moisello, 2015) or family management (e.g., Diéguez Soto, Manzaneque Lizano, & Rojo Ramírez, 2016), the number of family members on the board or the stock ownership of family members (Berrone, Cruz, Gomez-Mejia & Larraza-Kintana, 2010; Chrisman & Patel, 2012; Mishra & McConaughy, 1999). Most of these papers use SEW only as the conceptual base for their argumentation, but borrow proxies from adjacent fields such as corporate governance (e.g., Audretsch, Hülsbeck, & Lehmann, 2013) or the components of involvement approach (Chrisman & Patel, 2012). Furthermore, researchers who have adopted the scale have criticized its length and questioned its usefulness in evaluating SEW (Debicki et al., 2016; Hauck et al., 2016; Kallmuenzer et al., 2018; Miller & Le Breton-Miller, 2014). Finally, a scale that measures SEW should have the discriminatory power to recognize the heterogeneity of family firms effectively and efficiently. As a result, calls have been issued for a concise and psychometrically sound measure of SEW, in order to better understand family firm heterogeneity (Berrone et al., 2012; Debicki et al., 2016). In response to these calls, two substantial efforts were made, resulting in the development of the SEWi scale (Debicki et al., 2016) and the first validation of the FIBER scale, which produced the REI scale of Hauck et al. (2016).

A detailed analysis of the 84 unique publications citing Hauck et al. (2016) provides a differentiated picture of the reception and uitilization of FIBER and REI (see Table A2 in the Appendix). Only 14 empirical papers – 13 of them peer-reviewed – relied on a direct measurement of (parts of) FIBER. For example, Barros, Hernangómez, & Martin-Cruz (2017) adopted the original FIBER scale proposed by Berrone et al. (2012), in order to calculate a second-order construct measuring the mediation effect of SEW between familiness and organizational effectiveness. Other authors asked respondents to answer the full FIBER scale, but used every element separately to analyze, for example, the impact on family commitment (Razzak & Jassem, 2019), the direct influence on innovation (Lazzarotti, Gjergji, & Visconti, 2020), the effect on managerial capabilities (Ng, Dayan, & Di Benedetto, 2019), the mediating role between family functionality and innovativeness (Filser, De Massis, Gast, Kraus & Niemand, 2018), or the moderation effect on the relationship between dynamic capabilities and business model innovation (Weimann, Gerken, & Hülsbeck, 2020).

In their recent paper, Laffranchini, Hadjimarcou, & Kim (2020) collected data on SEW, in order to predict turnaround measures. They utilized the full FIBER scale, which they subsequently consolidated into a two-factor structure (restricted versus extended SEW). Umans, Lybaert, Steijvers, and Voordeckers (2019), for example, measured their dependent variable of 'succession intention' by using the 'R′ part of the REI scale. Kallmuenzer, Strobl, & Peters (2018) set out to analyse the moderation influence of SEW and calculated a second-order construct using a self-adapted and shortened 12-item version of the FIBER scale. The REI scale (Hauck et al., 2016) itself has so far been applied in four publications, of which only one was published in an internationally recognized peer-reviewed journal (Prügl & Spitzley, 2021). Prügl and Spitzley utilize only the 'I′ subscale of the REI scale when exploring the role of family identity with regard to external corporate venturing. Even after the publication of the REI scale, the few authors directly testing SEW mostly continued to use the FIBER scale, even though Hauck et al. (2016) had unambiguously exposed its conceptual and operational weaknesses. The REI scale still awaits its first full application in a peer-reviewed paper. At the same time, of the more than 100 publications analyzed in the wake of the REI publication, only two papers were identified which utilized alternative direct measures of SEW (including SEWi) (Baixauli-Soler, Belda-Ruiz, & Sánchez-Marín, 2021; Hernández-Linares, Sarkar, & López-Fernández, 2017), indicating no trend towards utilizing alternative measurements. The ratio of the total application of both scales to papers referencing FIBER or REI since 2017 is about 1%. We interpret this stark contrast as an expression of the high demand for a validated measure of SEW but not – as some critics have implied – as a failed attempt to measure SEW based on FIBER (respectively REI). We follow Hauck et al. (2016) in their demand for a rigorously validated, direct, multidimensional SEW scale of practical length.

Hauck et al. (2016) posit that the reason for the limited popularity of the FIBER scale is its lack of validation, and the corresponding lack of trust in the scale. The fact that the REI scale has met with similar conservatism is, in our view, not due to a lack of conceptual rigor of this

**Table 1**
Overview of the data analysis strategy and descriptive statistics of the surveys.

| Data analysis strategy | Exploratory factor analysis | | | | Confirmatory factor analysis | | | | Robustness test and test for a short scale | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Survey | Survey 1 | | Survey 2a | | Survey 3 | | Survey 4 | | Survey 2b | | Survey 5 | |
| Sample size | 193 | | 160 | | 190 | | 180 | | 124 | | 172 | |
| Context of the study | Pay variation in family firms | | Internationalization of family firms | | Business model innovation in family firms | | Business model innovation in family firms | | Internationalization of family firms | | Sustainability in family firms | |
| Respondents | Family firm owners | | Family firm owners | | Family firm owners | | Family firm owners | | Family firm owners | | Family firm owners | |
| Region | Switzerland, Germany, Austria | | Germany | | Germany, Austria | | Germany | | Europe, United States, Asia | | Switzerland | |
| Response scale | 7-point Likert-type scale | | 6-point Likert-type scale | | 6-point Likert-type scale | | 6-point Likert-type scale | | 6-point Likert-type scale | | 6-point Likert-type scale | |
| | ***M*** | ***SD*** | ***M*** | ***SD*** | ***M*** | ***SD*** | ***M*** | ***SD*** | ***M*** | ***SD*** | ***M*** | ***SD*** |
| Age of the firm | 81.40 | 61.23 | 79.63 | 45.74 | 63.83 | 45.58 | 102.47 | 78.54 | 68.40 | 45.87 | 82.63 | 59.29 |
| Generation | 2.87 | 1.05 | 3.02 | 1.26 | n.a. | n.a. | n.a. | n.a. | 3.00 | 2.26 | 1.61 | 0.66 |
| Number of employees | 538.10 | 862.33 | 2797.48 | 7896.19 | 159.67 | 625.50 | 2989.61 | 1,2478.86 | 937.26 | 1092.98 | 224.83 | 391.47 |
| Revenue in millions | 112.13 | 269.88 | 501.24 | 1330.20 | 29.05 | 110.14 | n.a. | n.a. | 360.02 | 1109.24 | 56.48 | 97.64 |

first validation attempt but, as Hauck et al. (2016) themselves point out, the fact that it was based on a very small sample size of 216 completed questionnaires. Due to their test strategy of using a holdout sample of 50% of the original sample, the available datasets consisted of two subsamples of $N = 108$, equalling four respondents per item. The generally accepted rule-of-thumb for using factor-analytic approaches in scale validations has been established as an absolute minimum of 10 respondents per item (Nunnally & Bernstein, 1994; Price, 2016), translating into a minimal subsample size of 270 respondents for validating the FIBER scale. More recently, authors in this domain have moved from item-respondent ratios towards more sophisticated measures, concerned with convergence of the covariance matrix and measures of congruence based on the ratio of variables to factors, and communality. In an early simulation study, Guadagnoli & Velicer (1988) find that a component pattern cannot be interpreted unless the size of the sample is larger than 300–450; they conclude that replication is necessary for all studies that do not meet this range. Further simulation studies, which have included measures of congruence (MacCallum, Widaman, Zhang & Hong, 1999) as well as differing degrees of communality of items (Mundfrom, Shaw, & Ke, 2005), have yielded similar results, recommending minimum sample sizes between 300 and 500 respondents for questionnaires with a variable-to-factor ratio below six (FIBER: 27/5 =5.4); some of them have also observed improvements in factor structure up to sample sizes of 2000 respondents (Comrey, 1988; Mundfrom et al., 2005). The very limited sample size of an initial testing sample of $N = 108$ in the Hauck et al. (2016) validation may also be the reason why the dimension *binding social ties* ('B′) of the FIBER scale (Berrone et al., 2012) did not pass the empirical validation process, despite being conceptually highly valid. Based on the test-theoretic properties of this first validation alone, a replication of the results seems to be indicated, in order to encourage the use of trusted direct measures of SEW in family business research.

Hauck et al. (2016) themselves explicitly address a number of limitations in their sample, which led to a lack of overarching validity. As the sample consists soley of SMEs that are completely owner-managed and privately-held, and since the sample is entirely based in the German context, there is a demonstrable need for future research to "revalidate the scale with a sample composed of more heterogeneous firms" (Hauck et al., 2016, p. 143). This could include mixed TMTs, larger family firms, and an international context. The authors themselves "invite scholars to replicate our validation with different samples employing the criteria mentioned above" (Hauck et al., 2016, p. 143). Further limitations, not addressed in the original study, concern the nomological and predictive validity of the FIBER, as well as the REI, scale.

In summary, although a commendable initial validation attempt, which is conceptually solid and based on the FIBER conceptualization of Berrone et al. (2012), has been published by Hauck et al. (2016), there remain only a handful of empirical studies which directly measure an owner family's SEW stock. Additionally, these papers are not unambiguous, with regard to the psychometric properties of the scale. Some papers utilize a second-order conceptualization (e.g., Barros et al., 2017). One paper, according to the conceptual considerations of Miller and Le Breton-Miller (2014), suggests a two-dimensional measurement (Laffranchini et al., 2020). Others, using the full FIBER scale, are not invariably able to confirm the five-dimensional structure originally proposed (e.g., Filser et al., 2018; Ng et al., 2019; Weimann et al., 2020). This may be due to the variation of the number and selection of items used per dimension between studies. For example, Filser et al. (2018) built the 'R′ construct around 4 items; Umans et al. (2019), however, did so based on 3 items. One study was unable to confirm the discriminatory validity between the dimensions of family control ('F′) and identification ('I′) (Kallmuenzer et al., 2018). These results are puzzling, since the REI validation asserts that the 'F′ and 'B′ parts of the original FIBER scale cannot be used because the psychometric properties did not achieve the required thresholds (Hauck et al., 2016). As a result, Brigham and Payne (2019), in a recent editorial on SEW, called for additional research to address the "lack of clarity on the validity of SEW as a construct" (p. 326). By revising and validating the SEW measurement model, we take an important developmental step in the research field. Revalidating the FIBER scale, in order to map the conceptual nature of SEW onto a sound, multidimensional, theoretically grounded construct is a significant step towards enabling and leveraging research into family firm heterogeneity (Berrone et al., 2012; Massis, Wang, & Chua, 2019; Miller & Le Breton-Miller, 2014).

## 2. Method

### 2.1. Sample

We deliberately collated a large and diverse dataset, in order to explore the psychometric properties and generalizability of the proposed FIBER scale. As seen in Table 1, we built a dataset based on five surveys taken from five studies in the field of family business research. All surveys defined family business by family ownership, control, and the intent to pass the family business on to future generations (Chua, Chrisman, & Sharma, 1999). All studies used questionnaires in which the FIBER scale was included (Heider, Gerken, Van Dinther & Hülsbeck, 2020; Schäfer, 2016; Schneider, 2018; Weimann, 2019). This led to a total, N = 1026. We checked for duplicate entries and outliers across all surveys based on a combination of the founding year of the firm, respondent age, industry, generation, region, revenue, and the number of employees. This resulted in the removal of seven respondents in total (N = 1019). Survey 1 ($N = 193$) was taken from a study that examined pay variation in family firms (Schäfer, 2016). Surveys 2a and 2b ($N = 287$) were drawn from a study conducted amongst family firms to assess the influence of the family on the internationalization of the firm

(Schneider, 2018). The study distinguished between German respondents (Survey 2a, $N = 160$) and international respondents (Survey 2b, $N = 124$). Survey 3 ($N = 190$) and Survey 4 ($N = 180$) were carried out in order to explore the business model innovation in family firms (Heider et al., 2020; Weimann, 2019). Finally, survey 5 ($N = 172$) stems from an ongoing research project investigating sustainability in Swiss family firms (Ernst, Gerken, Hack & Hülsbeck, 2022). The decision to utilize multiple samples that we collected over a six-year period (2014–2020), as well as to integrate an international sample, was not only in response to the explicit request by Hauck et al. (2016) "to replicate our validation with different samples employing the criteria mentioned above." (p. 143) but also stemmed from their advice to use multi-country and multiple time-point data, in order to ensure the generalizability of the results (Hauck et al., 2016, p. 143). Table 1 shows the descriptive statistics ($N = 1019$ in total). Family firms were, on average, 80 years old ($SD$= 58.91) and in the third generation ($SD$= 1.51). The smallest family firm employed three employees, and the largest had 116,000 employees; the firms had an average of 1233.07 ($SD$= 6135.84) employees.

### 2.2. Data analysis strategy

Our data analysis strategy consisted of three major steps (Hinkin, 1995, 1998): exploratory factory analysis, confirmatory factor analysis, and robustness tests, which we describe in more detail below. We thereby followed established guidelines for testing the psychometric properties of scales (Brown, 2014; Campbell & Fiske, 1959; Hinkin, 1995; Price, 2016), which should generally demonstrate construct validity, content validity, reliabiliaty, and criterion-related validity (Churchill, 1979; Hinkin, 1995; Price, 2016).

In the first step, we performed an exploratory factor analysis (EFA). To explore the plausibility of the scale as it was originally proposed, we first conducted EFA with principal component extraction and varimax rotation for Survey 1, and the German respondents of Survey 2a (total $N = 353$). Due to the use of two different Likert-type scales, and in the interest of standardization, we converted the distribution of observations into $z$-scores before analysis (Fischer & Milfont, 2010). We applied the eigenvalue-greater-than-one criterion (Kaiser, 1960), as well as Cattell's scree test, in order to determine the number of factors. We took a Kaiser-Meyer-Olkin (KMO) value above.70 and a significant Bartlett's test result as indicators of the adequacy of the data (Lance, Butts, & Michels, 2006). Also, we followed Schmitt (2011) and assessed the model fit with the comparative fit index (CFI), the root mean square residual (RMSEA), and the standardized root mean square residual (SRMR), so as to avoid selecting too few – or too many – factors. A CFI above.90 indicates a good fit. The RMSEA should be below.05 and the SRMR should be below.08 (Hu & Bentler, 1999). Our decisions were further based on construct validity (Campbell & Fiske, 1959). Construct validity is the degree to which a scale actually measures what it claims to measure and is divided into convergent (agreement between similar constructs) and discriminant (distinction between dissimilar constructs) validity (Campbell & Fiske, 1959; Clark & Watson, 1995). This helped us to identify items that could be removed from the instrument, without reducing the quality of the scale (Hays & Hayashi, 1990). In addition to construct validity, we also analyzed content validity. This is done by examining the fit between the theoretical definition of the concept and its empirical measure (Bryman & Storey, 2018). Content validity is especially important when reducing the number of items and, thus, the length of a scale. We evaluated the content of the items to ensure that those were included which are central, according to the conceptual model of Berrone et al. (2012). Next, we used Tucker's congruence coefficient (Lorenzo-Seva & ten Berge, 2006; Tucker, 1951), in order to compare the resulting factor loadings of the EFA. This step was taken to ensure maximum power; power would otherwise be lost, if the total sample were split in half. The congruence coefficient helps in the study of the desired similarity of extracted factors across the samples, and may have values between − 1 and + 1; these are interpreted as being similar to the Pearson's correlation coefficient. Values of Tucker's congruence coefficient > 0.80 indicate high similarity among the desired extracted factors. Finally, we evaluated the internal consistency of the scales using Cronbach's alpha and the item-total correlation. According to the literature, Cronbach's alpha values above.70 are considered acceptable (Hays & Hayashi, 1990). Regarding the item-total correlation, values between 0.2 and 0.8 are considered sufficient (Hays & Hayashi, 1990).

In the second step, we conducted a confirmatory factor analysis (CFA) to test the replicability of our empirically derived scale and used a new testing sample (surveys 3 and 4; $N = 370$). CFA helped us confirm the number of factors, and to confirm which variable related to which latent construct. The results of EFA, as well as the theoretical rationale behind SEW, guided the decision as to which item should load on which factor. We followed Hu and Bentler (1999) and used the same indices as mentioned above and the TLI to assess the model fit; TLI and CFI values of.90 or higher, an RMSEA below.05, and an SRMR below.08 indicate good model fit. We allowed the error terms to correlate between items that belonged to the same dimension and probably correlated more strongly than could be explained by the hypothetical latent constructs. We also calculated descriptive statistics and internal consistency estimates using the testing sample based on EFA and the validation sample from CFA to compare the results. Finally, the instrument should have criterion-related validity; that is, the instrument should have nomological and predictive validity (Clark & Watson, 1995; Hinkin, 1998). Thus, it should be meaningful in its nomological net and have predictive value (Clark & Watson, 1995; Podsakoff & MacKenzie, 1994). To test for nomological validity, we performed correlation analyses (Clark & Watson, 1995; Hinkin, 1995; Podsakoff & MacKenzie, 1994) between several demographic variables that should be theoretically related to the four dimensions. For predictive validity, we conducted a regression analysis.

In the last step we tested the robustness of the newly derived scale with two new samples (Survey 2b, $N = 124$; Survey 5, $N = 172$), and two created subsamples of large family firms, and small and medium-sized family firms. We assessed the nomological and predictive validity of the scale as well. In addition, because some research settings require scales with few items (Stanton, Sinar, Balzer, & Smith, 2002), we composed a short scale with 12 items from the newly derived scale that measured the same latent dimensions as the testing sample. The reason is that the FIBER scale, with its 27 items, is much longer than would be ideal (Kallmuenzer et al., 2018). Even though the instrument may be valid in terms of content, it may be of limited practical use, should participants not be willing to take the time to complete it. This is especially problematic when the instrument is combined with several other measures in a single survey (Umans et al., 2019). As a result, this could lead to a lower response rate (Baruch & Holtom, 2008). For this, we took the three highest-loading factors from the testing sample for the short scale, and subsequently tested the short scale with the same two new samples as for the robustness tests. Last, we also assessed the nomological and predictive validity for the short scale.

## 3. Results

### 3.1. Exploratory factor analysis

The eigenvalue-greater-than-one criterion (Kaiser, 1960) and Cattell's scree test suggested a six-factor solution. As the original FIBER scale uses five factors, we decided to assess both the five-factor structure and the six-factor structure (Hair, Black, Babin & Anderson, 2019). The goal was to determine which structure provided a better model fit using the comparative fit index (CFI), the root mean square residual (RMSEA), and the standardized root mean square residual (SRMR), so as to avoid selecting too few – or too many – factors (Schmitt, 2011). A CFI above.90 indicates a good fit. The RMSEA should be below.05 and the SRMR should be below.08 (Hu & Bentler, 1999). The five-factor structure

**Table 2**
Results of the principal component analysis (PCA) with varimax rotation.

| | Family control and influence | | Identification of family members with the firm | Binding social ties | Emotional attachment of family members | Renewal of family bonds to the firm through dynastic succession | Item-total correlation | Cronbach's α if the item is deleted |
|---|---|---|---|---|---|---|---|---|
| | Factor 1 | Factor 2 | | | | | | |
| *Cronbach's α* | *.781* | *.555* | *.838* | *.789* | *.865* | *.824* | | |
| **Item** | | | | | | | | |
| Family control_3 | .712 | | | | | | .643 | – |
| Family control_5 | .670 | | | | | | .643 | – |
| Family control_1 | | .333 | | | | .479 | .707 | .383 |
| Family control_2 | | | | | | .314 | – | – |
| Family control_4 | | .311 | .302 | | | | .786 | .723 |
| Family control_6 | | .310 | | | | .632 | .735 | .341 |
| Identification_1 | | | .543 | .505 | | .353 | .758 | .807 |
| Identification_2 | | | .687 | | | | .804 | .794 |
| Identification_3 | | | .608 | .326 | | | .799 | .798 |
| Identification_4 | | | .715 | | .344 | | .821 | .791 |
| Identification_5 | | | .629 | | .306 | | .774 | .803 |
| Identification_6 | | | .345 | | | | .591 | .871 |
| Binding social ties_1 | | -0.334 | | .335 | | | .636 | .786 |
| Binding social ties_2 | | | | .517 | | | .736 | .758 |
| Binding social ties_3 | | | | .720 | | | .801 | .727 |
| Binding social ties_4 | | | | .512 | | | .765 | .733 |
| Binding social ties_5 | | | | .590 | .307 | | .754 | .737 |
| Emotional attachment_1 | | | | | .662 | | .752 | .847 |
| Emotional attachment_2 | | | | | .560 | | .714 | .858 |
| Emotional attachment_3 | | | | | .687 | .301 | .825 | .829 |
| Emotional attachment_4 | | | | | .737 | | .815 | .832 |
| Emotional attachment_5 | | | .331 | | .722 | | .847 | .823 |
| Emotional attachment_6 | | | .309 | | .476 | | .687 | .862 |
| Renewal of family bonds_1 | | | | | | .659 | .809 | .777 |
| Renewal of family bonds_2 | | | | | | .645 | .752 | .802 |
| Renewal of family bonds_3 | | | | | | .704 | .835 | .772 |
| Renewal of family bonds_4 | | | | | | .746 | .843 | .756 |

*Note:* N = 353; Item loadings < 0.30 are suppressed.

resulted in a poor fit (*CFI*=0.81; *RMSEA*=0.09; *SRMR*=0.07). The factor structure yielded weakly defined factors, with numerous items cross-loaded on several factors, whilst others loaded insignificantly on one factor. This made the result difficult to interpret. The model of the six-factor structure appeared to have a better fit (*CFI*=0.86; *RMSEA*=0.08; *SRMR*=0.06). We evaluated the six-factor structure using several criteria. Specifically, we looked for a structure that had loadings of at least.40, that provided internally consistent factors, and that made sense in terms of representativeness, interpretability, and parsimony (Hair et al., 2019). If there were cross-loadings, we also calculated and compared the ratio of variance (Hairet al., 2019). The six-factor structure had only two weakly defined factors (Schmitt, 2011) that belonged to the dimension *family control and influence* ('F'). As can be seen in Table 2, the 'F' dimension was divided into two factors, with only two or three items loading on each factor. Factor 1 contained only two items (F_3 and F_5); this is generally referred to as a weak factor (Schmitt, 2011). Next, items F_1 and F_6 cross-loaded on two factors. Moreover, the internal consistency for factor 2 ($\alpha = 0.55$) was considerably lower than the acceptable value of.70, which also indicates a weak factor (Schmitt, 2011). Item F_6 also loaded significantly on factor six. Although a comparison of the ratio of variance (Hairet al., 2019) indicated the item to be not problematic, a closer look at the content showed that item F_6 differed from the other items belonging to factor six, because it focuses on the independence of the family business. Therefore, we decided to remove items F_1 to F_6, as these items also loaded on the two weak factors of the 'F' dimension. The factor structure showed some additional complications with items for the dimensions *identification of family members with the firm* ('I') and *binding social ties* ('B'). Item I_6 had a low loading on one factor, whereas items I_1 and B_1 did not load significantly on any factor. Subsequently, we examined the content. All three items referred to a general external perspective of the family business. Therefore, we removed the three items. Furthermore, item E_6, belonging to the dimension *emotional attachment*, did not load significantly on any factor. We removed this item as well. The item-total correlations and internal consistencies (Table 2) showed that the primary loadings of the remaining factors, and the factors where cross-loadings existed, were much higher than for the others. Also, the secondary loadings appeared to represent reasonable relationships between factors. Therefore, we kept these items in the scale.

After we had removed the items that had a low statistical and content-related relevance, we carried out another factor analysis. The outcome suggested a four-factor solution with 17 items in total

**Table 3**
Results of the exploratory factor analysis loadings for the final instrument.

| | | Identification of family members with the firm | Binding social ties | Emotional attachment of family members | Renewal of family bonds to the firm through dynastic succession |
|---|---|---|---|---|---|
| | *Cronbach's α* | *.845* | *.786* | *.862* | *.824* |
| **Item** | **Item content** | | | | |
| I_2 * | Family members feel that the family business's success is their own success. | .773 | | | |
| I_3 | My family business has a great deal of personal meaning for family members. | .681 | | | |
| I_4 * | Being a member of the family business helps define who we are. | .800 | | .328 | |
| I_5 * | Family members are proud to tell others that we are part of the family business. | .729 | | | |
| B_2 * | In my family business, non-family employees are treated as part of the family. | | .683 | | |
| B_3 * | In my family business, contractual relationships are mainly based on trust and norms of reciprocity. | | .800 | | |
| B_4 | Building strong relationships with other institutions (i.e., other companies, professional associations, government agents, etc.) is important for my family business. | | .667 | | |
| B_5 * | Contracts with suppliers are based on enduring long-term relationships in my family business. | | .715 | | |
| E_1 * | Emotions and sentiments often affect decision-making processes in my family business. | | | .763 | |
| E_2 | Protecting the welfare of family members is critical to us, apart from personal contributions to the business. | | | .692 | |
| E_3 | In my family business, the emotional bonds between family members are very strong. | | | .694 | .322 |
| E_4 * | In my family business, affective considerations are often as important as economic considerations. | | | .802 | |
| E_5 * | Strong emotional ties among family members help us maintain a positive self-concept. | .326 | | .713 | |
| R_1 * | Continuing the family legacy and tradition is an important goal for my family business. | | | | .731 |
| R_2 | Family owners are less likely to evaluate their investment on a short-term basis. | | | | .725 |
| R_3 * | Family members would be unlikely to consider selling the family business. | | | | .803 |
| R_4 * | Successful business transfer to the next generation is an important goal for family members. | | | | .844 |

*Note:* N = 353; Item loadings < 0.30 are suppressed; items for the short scale are marked with an * ; item content taken from Berrone et al. (2012).

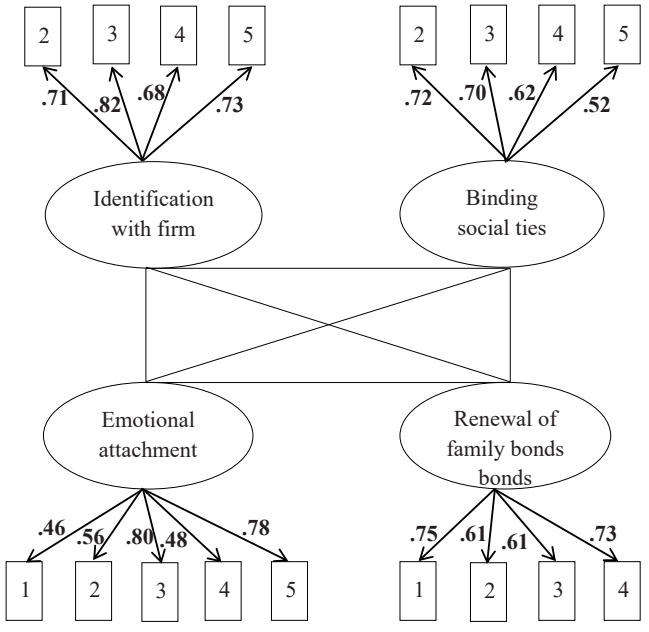


**Fig. 1.** Path diagram with results for the four-factor model, including standardized factor loadings ($N = 370$); Model fit indices: *TLI* 0.84, *CFI* 0.87, *RMSEA* 0.07, and *SRMR* 0.08.

**Table 4**
Results of the descriptive statistics for the EFA and CFA sample.

| | EFA sample ($N = 353$) | | | CFA sample ($N = 370$) | | |
|---|---|---|---|---|---|---|
| | *M* | *SD* | *α* | *M* | *SD* | *α* |
| 1. Identification with the firm | 4.91 | 1.23 | 0.84 | 4.69 | 1.14 | 0.83 |
| 2. Binding social ties | 4.84 | 1.19 | 0.78 | 4.39 | 0.96 | 0.73 |
| 3. Emotional attachment | 3.87 | 1.25 | 0.86 | 3.80 | 1.02 | 0.80 |
| 4. Renewal of family bonds | 5.26 | 1.08 | 0.82 | 4.72 | 1.12 | 0.79 |

(Table 3). The four-factor structure was sound and well-defined and showed one factor for *identification with the firm* (4 items after removal of I_1 and I_6), one factor for *binding social ties* (4 items after removal of B_1), one factor for *emotional attachment* (5 items after removal of E_6) and one factor for *renewal of family bonds* (4 items). The factor *renewal of family bonds* corresponded to the original dimension developed by (Berrone et al., 2012).

All factors showed internal reliability estimates that were almost always greater than.80 and greater than the generally stated cut-off of.70 (Lance et al., 2006). Tucker's congruence coefficient was 0.96 for the first factor, *identification of family members with the firm*; 0.90 for the second factor, *binding social ties*; 0.95 for the third factor, *emotional attachment*; and 0.80 for the fourth factor, *renewal of family bonds*. These results indicated factor similarity and therefore good replicability of the factor structure (Berrone et al., 2012; Lorenzo-Seva & ten Berge, 2006). Thus, the results of the EFA indicated a four-factor structure.

**Table 5**
Correlations.

| | 17-item scale | 12-item scale |
|---|---|---|
| Identification with the firm | | |
| Family CEO | 0.03 | 0.04 |
| | (0.65) | (0.57) |
| Number of family members in TMT | 0.18 * ** | 0.19 * ** |
| | (0.00) | (0.00) |
| Total of shares owned by family | 0.06 | 0.04 |
| | (0.25) | (0.37) |
| Firm age | -0.19 * ** | -0.20 * ** |
| | (0.00) | (0.00) |
| Binding social ties | | |
| Family CEO | 0.19 * ** | 0.21 * ** |
| | (0.00) | (0.00) |
| Number of family members in TMT | 0.09 * | 0.10 * |
| | (0.06) | (0.05) |
| Total of shares owned by family | -0.00 | -0.03 |
| | (0.96) | (0.46) |
| Firm age | -0.08 * | -0.12 * * |
| | (0.09) | (0.02) |
| Emotional attachment | | |
| Family CEO | 0.03 | 0.02 |
| | (0.62) | (0.78) |
| Number of family members in TMT | 0.18 * ** | 0.19 * ** |
| | (0.00) | (0.00) |
| Total of shares owned by family | 0.10 * * | 0.11 * * |
| | (0.03) | (0.03) |
| Firm age | -0.17 * ** | -0.15 * * |
| | (0.00) | (0.00) |
| Renewal of family bonds | | |
| Family CEO | 0.02 | 0.00 |
| | (0.71) | (0.96) |
| Number of family members in TMT | 0.14 * ** | 0.15 * ** |
| | (0.00) | (0.00) |
| Total of shares owned by family | 0.06 | 0.06 |
| | (0.22) | (0.19) |
| Firm age | 0.11 * * | 0.11 * * |
| | (0.02) | (0.02) |

*Note:* N = 370; correlation coefficients (and associated p-values); * **p < .01, * *p < .05, *p < .10.

### 3.2. Confirmatory factor analysis

In the next step, we conducted a CFA on the validation sample, with the results of the EFA guiding our decision, as to which factor to load the items on. We modeled items I_2 to I_5 to load on the factor *identification of family members with the firm*; items B_2 to B_5 were modeled to load on the factor *binding social ties*; items E_1 to E_5 were modeled to load on the factor *emotional attachment*; and items R_1 to R_4 were modeled to load on the factor *renewal of family bonds*. The model fit was adequate (*TLI*=0.84; *CFI*=0.87; *RMSEA*=0.08; *SRMR*=0.07). Fig. 1 shows the path diagram with factor loadings and model fit indices. In summary, we found support for the four-factor model with 17 items in total. We additionally tested the generalizability of the model with robustness tests (see Table 7).

**Table A1 Description of samples**

| | Suvey 1 | Survey 2 | Survey 3 | Survey 4 | Survey 5 |
|---|---|---|---|---|---|
| Year of data collection | 2014 | 2017 | 2017 | 2018 | 2020 |
| Number of questionnaires sent | 4653 | 7964 | 23,621 | 3714 | 1602 |
| Number of completed questionnaires | 194 | 287 | 191 | 181 | 172 |
| Response rate | 4,1% | 3,5% | 0,8% | 4,9% | 10,7% |
| Respondents | Family-firm owners | Family-firm owners | Family-firm owners | Family-firm owners | Family-firm owners |
| Total of shares owned by family | 98,1% | 92,8% | 95,4% | 94,3% | 88,5% |
| TMT size (on average) | 3.70 | 3.94 | 2.80 | 3.82 | 5.60 |
| Number of family members in TMT (on average) | 1.73 | 1.86 | 1.90 | 2.51 | 2.16 |
| Family CEO | Yes | Yes | Yes | Yes | Yes |
| Industry | | | | | |
| Manufacturing | 50% | 52% | 24% | 16% | 25% |
| Service Activities | 11% | 12% | 25% | 9% | 16% |
| Agriculture | 1% | 0% | 14% | 1% | 3% |
| Suppliers | 0% | 0% | 3% | 14% | 8% |
| Building/ Construction | 10% | 0% | 17% | 4% | 31% |
| Trade | 26% | 20% | 17% | 16% | 14% |
| Information/ Communication | 2% | 0% | 1% | 26% | 3% |
| Other | 1% | 16% | 0% | 14% | 0% |

**Table 6**
Regression with business model innovation as the dependent variable.

| | 17-item scale | | | | | 12-item scale | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *β* | *p* | *adj. $R^2$* | *$R^2$* | *F* | *β* | *p* | *adj. $R^2$* | *$R^2$* | *F* |
| Identification with the firm | -0.05 | 0.37 | 0.05 | 0.06 | 5.34 * | -0.06 | 0.25 | 0.05 | 0.05 | 4.56 * |
| Binding social ties | 0.27 * ** | 0.00 | | | | 0.23 * ** | 0.00 | | | |
| Emotional attachment | -0.09 | 0.16 | | | | -0.03 | 0.55 | | | |
| Renewal of family bonds | 0.11 * * | 0.04 | | | | 0.12 * * | 0.01 | | | |

*Note:* N = 370; standardized coefficients are reported; * **p < .01, * *p < .05, *p < .10.

**Table 7**
Results of the robustness test.

| *17-item scale* | *N* | *$\chi^2$* | *df* | *p* | *TLI* | *CFI* | *RMSEA* | *SRMR* |
|---|---|---|---|---|---|---|---|---|
| International family firms[a] | 124 | 486.14 | 107 | .00 | 0.92 | 0.93 | 0.06 | 0.04 |
| Swiss family firms[b] | 172 | 180.97 | 112 | .00 | 0.93 | 0.94 | 0.06 | 0.06 |
| Large family firms (>500 employees)[c] | 328 | 112.76 | 107 | .00 | 0.95 | 0.93 | 0.06 | 0.04 |
| Small and medium-sized family firms (<500 employees)[c] | 585 | 180.27 | 48 | .00 | 0.92 | 0.94 | 0.06 | 0.05 |
| *12-item short scale* | | | | | | | | |
| International family firms[a] | 124 | 85.82 | 45 | .00 | 0.87 | 0.91 | 0.08 | 0.07 |
| Swiss family firms[b] | 172 | 94.52 | 47 | .00 | 0.92 | 0.94 | 0.07 | 0.06 |

[a] Survey 2b.
[b] Survey 5.
[c] Sample created based on survey 2b and 5.

**Table A2**
Reception of Hauck et al. (2016).

| *Unique publications referencing* Hauck et al. (2016) | *84* |
|---|---|
| … in peer-reviewed outlets… | 70 |
| … of those measuring FIBER (or at least selected components) | 13 |
| … of those measuring REI (or at least selected components) | 1 |
| ***Peer reviewed journals referencing*** Hauck et al. (2016) ***at least twice*** | ***33*** |
| Journal of Family Business Strategy | 14 |
| Family Business Review | 5 |
| Journal of Business Research | 5 |
| Journal of Family Business Management | 3 |
| International Journal of Entrepreneurship and Small Business | 2 |
| Journal of Entrepreneurship, Management and Innovation | 2 |
| Journal of Management Studies | 2 |

Next, we compared the results of the EFA sample with the results of the CFA sample (Lance et al., 2006). In particular, we examined how the factors were related based on the descriptive statistics and internal consistencies between the samples (Table 4). Although the results showed a slight difference in the mean values, the standard deviations and Cronbach's alpha estimates were similar. The results show that samples were comparable, thus supporting the four-factor structure.

Next, we assessed the nomological validity of the newly validated 17-item instrument using correlation analyses (Table 5). Since SEW is significantly determined by the business family, we conducted correlations with several family-firm-specific characteristics that are related to the dimensions (Berrone et al., 2012). Past research showed that SEW depends on whether the firm has a family CEO, the number of family members in the top management team, the shares owned by the family, and firm age (Diéguez Soto et al., 2016; Gottardo & Moisello, 2015). We included these four variables. The results showed significant correlations and, thus, evidence of nomological validity for all four dimensions.

To show the predictive validity we regressed the four dimensions on the variable business model innovation (Table 6), that is, to show how far the dimensions related to innovation and risk-taking behavior of the firm (Spieth & Schneider, 2016). We selected business model innovation because family firms often pursue new business ideas over several generations. In doing so, they have the desire to hand over a successful business to the next generation (Jaskiewicz, Combs, & Rau, 2015). The results showed a link between two dimensions (*binding social ties* and *renewal of family bonds*) and business model innovation, but not the other two dimensions. Further evidence is needed on the prediction of the scale.

### 3.3. Robustness tests and testing a short scale

We validated the robustness of the four-factor model amongst a sample of international family firms, Swiss family firms, and amongst our two created subsamples of large, and small and medium-sized family firms (Table 7). The fit indices indicated the acceptable fit of the scale. For the short scale, we took the three highest factor loadings of each dimension of the 17-item scale and computed a scale with 12 items (Table 3; indicated with a *). We verified the short scale amongst the same two new samples of Swiss family firms and international family firms (Table 7). Overall, the fit indices suggested a good fit of the short scale, indicating the generalizability of the scale. Lastly, we tested the nomological and predictive validity of the short scale using the CFA sample and the same variables for comparability. The results, in Table 5 and Table 6, show support for the nomological validity and evidence of predictive validity. All of these results are discussed below.

## 4. Discussion

SEW is one of the most frequently used constructs in family business research. This study replicated and validated the recent work of Hauck et al. (2016), who proposed three dimensions for measuring SEW. Our

**Table A3**
Comparison of the scales measuring socio-emotional wealth.

| | Original scale as proposed by Berrone et al. (2012) | 17-item scale | 12-item scale | REI scale ( Hauck et al., 2016) |
|---|---|---|---|---|
| **Item** | **Item content** | | | |
| F_1 | The majority of the shares in my family business are owned by family members. | | | |
| F_2 | In my family business, family members exert control over the company's strategic decisions. | | | |
| F_3 | In my family business, most executive positions are occupied by family members. | | | |
| F_4 | In my family business, nonfamily managers and directors are named by family members. | | | |
| F_5 | The board of directors is mainly composed of family members. | | | |
| F_6 | Preservation of family control and independence are important goals for my family business. | | | |
| I_1 | Family members have a strong sense of belonging to my family business. | | | * |
| I_2 | Family members feel that the family business's success is their own success. | * | * | |
| I_3 | My family business has a great deal of personal meaning for family members. | * | | * |
| I_4 | Being a member of the family business helps define who we are. | * | * | |
| I_5 | Family members are proud to tell others that we are part of the family business. | * | * | * |
| I_6 | Customers often associate the family name with the family business's products and services. | | | |
| B_1 | My family business is very active in promoting social activities at the community level. | | | |
| B_2 | In my family business, non-family employees are treated as part of the family. | * | * | |
| B_3 | In my family business, contractual relationships are mainly based on trust and norms of reciprocity. | * | * | |
| B_4 | Building strong relationships with other institutions (i.e., other companies, professional associations, government agents, etc.) is important for my family business. | * | | |
| B_5 | Contracts with suppliers are based on enduring long-term relationships in my family business. | * | * | |
| E_1 | Emotions and sentiments often affect decision-making processes in my family business. | * | * | |
| E_2 | Protecting the welfare of family members is critical to us, apart from personal contributions to the business. | * | | |
| E_3 | In my family business, the emotional bonds between family members are very strong. | * | | * |
| E_4 | In my family business, affective considerations are often as important as economic considerations. | * | * | |
| E_5 | Strong emotional ties among family members help us maintain a positive self-concept. | * | * | * |
| E_6 | | | | * |

(*continued on next page*)

**Table A3** (*continued*)

| | Original scale as proposed by Berrone et al. (2012) | 17-item scale | 12-item scale | REI scale ( Hauck et al., 2016) |
|---|---|---|---|---|
| | In my family business, family members feel warmth for each other. | | | |
| R_1 | Continuing the family legacy and tradition is an important goal for my family business. | * | * | * |
| R_2 | Family owners are less likely to evaluate their investment on a short-term basis. | * | | * |
| R_3 | Family members would be unlikely to consider selling the family business. | * | * | |
| R_4 | Successful business transfer to the next generation is an important goal for family members. | * | * | * |

* = the item belongs to the scale.

psychometric validation revealed a noteworthy discrepancy (Table A3), with regard to the three-dimensional scale of Hauck et al. (2016). Whilst their scale focuses on the dimensions *identification of family members with the firm*, *emotional attachment*, and *renewal of family bonds*, it places no weight on *binding social ties* (Berrone et al., 2012; Hauck et al., 2016). However, this dimension is considered to be highly relevant, since it represents the long-lasting relationship and social embeddedness that are thought to be unique to family firms (Cennamo, Berrone, Cruz, & Gomez-Mejia, 2012). By validating and reintegrating the affective values of the dimension *binding social ties* into our four-factor model, our scale extends the scale of Hauck et al. (2016). Another difference is the omission of the item I_1 ('Family members have a strong sense of belonging to my family business') and item E_6 ('In my family business, family members feel warmth for each other') in our scale.

We confirm that SEW is multidimensional in nature, with four factors, and that it can be successfully used as a higher-order construct (Brigham & Payne, 2019). Interestingly, the assumption that *family control and influence* is an important dimension of FIBER could not be confirmed by our study. This finding is in line with the previous research result of Hauck et al. (2016), who state that control and influence can be estimated using simpler measures than those originally proposed by Berrone et al. (2012). In addition, the dichotomous formulations of the items belonging to this dimension imply that the items are impossible to answer on a Likert-type scale. Previous studies in the field of corporate governance of family firms have already identified hard proxies suitable for examining family control, such as the percentage of family ownership, percentage of family members in the top management team, and percentage of family members in the board of directors (Anderson & Reeb, 2003; Audretsch et al., 2013; Hauswald, Hack, Kellermanns & Patzelt, 2016; Hülsbeck et al., 2018; Lohe & Calabrò, 2017; Westhead, Cowling, & Howorth, 2001). Family control can therefore be better operationalized with objective measures of corporate governance, rather than being regarded as a latent construct (Hasenzagl, Hatak, & Frank, 2018). In this line, we follow Hauck et al. (2016) and suggest replacing the content of the dimension with simple direct measures for the aforementioned proxies.

The results of our replication and validation study also answer the additional call for action in the literature, with regard to the SEW construct (Brigham & Payne, 2019; Swab et al., 2020). Brigham and Payne (2019) argue that the construct is currently based on both behavioral and dispositional components; this raises concerns, based "on the assumption that constructs should be one or the other and that the most useful constructs are distinct" (Brigham & Payne, 2019, p. 327). Our results indicate that the 17 items in the scale hint at a dispositional construct, rather than a behavioral one. Thus, family firms are predisposed to frame decisions in certain ways. Next, we confirm that the construct is specific to family firms (Brigham & Payne, 2019).

The newly validated instrument advances research and enables further research to be carried out into the different decision strategies across family firms. For example, researchers could use the newly derived instrument to identify the decisions that may promote the longevity of family businesses, and to explore differences in perceptions of business family owners. In doing so, our reliable, valid, and short measure of SEW can help them overcome the continuously declining survey response rates in social and management research due to survey fatigue (Prügl, 2019). In addition, Debicki et al. (2016) have measured the importance of SEW to families with the SEWi scale; as both the individual and family group perspectives are required to measure the influence on the family business (Dyer, 2003; Westhead & Cowling, 1998), we move towards a unifying measure of family influence.

Given the growing importance of the heterogeneity of family firms, the development of tools that allow a clearer understanding of socio-emotional wealth is vital. Researchers and practitioners should not merely rely on indirect proxy measures for SEW, but should also consider and assess the perception of family firms and their stakeholders. This newly validated scale can help to go beyond a one-size-fits-all approach when assessing the heterogeneity of family firms, as indicated by the nomological validity. Both the 17-item scale and the short scale are part of a nomological net and show predictive validity; that is, they are well-suited for measuring SEW. In addition, family firms can more accurately evaluate how they perceive their SEW. The scale can also be used, however, as a diagnostic tool, for example, for showing how perceptions differ between family businesses.

Although our validation of the scale advances the field of SEW, this study is not free of limitations; these limitations, though, may open avenues for future research. The current findings do not provide information on how the instrument relates to other instruments that measure family firm heterogeneity, such as the SEWi scale. Understanding this relationship may help scholars to evaluate the (long-term) strategic choices of family firm owners. Additionally, further evidence is required, as to the criterion-related validity of the scale. Since some relations were of low significance, research with additional variables would be desirable, in order to further assess the nomological and predictive validity. Furthermore, future research should investigate the perceptions of family members within the same family firm in comparison to other family firms. This would allow for more information to be collated on the influence of agreement or disagreement regarding SEW and its potential consequences for the family firm. For example, a study by Vandekerkhof, Steijvers, Hendriks, and Voordeckers (2018) examined the separation of SEW, that is low and high levels of SEW, among members of the top management team of the same family firms. The separation of SEW negatively affected team decision-making quality but was overcome by high levels of psychological safety and behavioral integration (Vandekerkhof et al., 2018). Thus, further research could help to investigate to which extent SEW is a construct of the family firm or of the individual and what the implications are for the family firm. Nevertheless, our study aimed at the replication of the existing FIBER scale for measuring SEW. The new instrument is in line with the concept of SEW. The result showed a stable four-factor structure that benefits both researchers and practitioners by providing an improved measurement, in order to gain further insights into the concept of SEW and the strategic choices of family firms.

## CRediT authorship contribution statement

**Maike Gerken:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Validation, Visualization, Writing – original draft. **Marcel Hülsbeck:** Conceptualization, Data curation, Methodology, Validation, Writing – review & editing. **Thomas Ostermann:** Data curation, Formal analysis, Methodology. **Andreas Hack:** Conceptualization, Validation, Writing – review & editing.

## Appendix

(See: Appendix Tables A1–A3).

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