An Exploratory Meta-Analysis of the Nomological Network of Bootstrapping in SMEs

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Highlights:

• We find no significant relation, overall, between bootstrapping and small firm performance.
• Bootstrapping is significantly and negatively related to performance when type of performance examined is profitability. Yet, the effect size of the bootstrapping-small firm performance relation is not significantly different from each other across firm performance measures (i.e., nonsignificant moderator effect of performance measures).
• Type of bootstrapping—specifically, customer-related, delay payment, and joint utilization—is significantly and positively related to firm performance. Yet, the effect size of the bootstrapping-small firm performance relation is not significantly different from each other across type of bootstrapping used (i.e., nonsignificant moderator effect of type of bootstrapping used).
• The relation between bootstrapping and small firm performance is not significantly different from each other across firm age, firm size, and bootstrapping measures used (i.e., nonsignificant moderator effect of firm age, firm size, and bootstrapping measures used).
• When percentage of male respondents is high, the relation between bootstrapping and small firm performance is significantly lower relative to when percentage of female respondents is high.
• Owners’ age is significantly and negatively related to bootstrapping.
• Firm age, human capital (i.e., entrepreneurial experience, management experience, education level), and social capital (i.e., strong ties, weak ties) are all significantly and positively related to bootstrapping.
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Abstract

Bootstrapping, the pursuit of creative ways of acquiring resources in non-traditional ways, is a defining entrepreneurial behavior in small and medium-sized enterprises (SMEs). However, after nearly three decades of research there is no quantitative synthesis of the literature. We meta-analyze data from 22 empirical samples, across 62 effect sizes, and find no significant overall relation between bootstrapping and SME performance. We examined a set of moderators (i.e., type of performance, type of bootstrapping, and bootstrapping measures). Some moderators alter the direction and influence the statistical significance of the bootstrapping-SME performance relation, but none of these moderators were statistically significant.

Keywords: bootstrapping; SME performance; entrepreneur; resources; meta-analysis; resource constraints
1. Introduction

Roughly 75% of emerging firms make no use of external debt or equity and instead proactively undertake a bootstrapping approach (Robb & Farhat 2013; Rutherford, 2015). Bootstrapping—defined as “highly creative ways of acquiring the use of resources without borrowing money or raising equity financing from traditional sources” (Freear, Sohl, & Wetzel 1995, p. 102)—has been called “part and parcel to the entrepreneurial experience” (Rutherford, Coombes, & Mazzei, 2012, p. 3). Not surprisingly, a growing number of researchers in the entrepreneurship domain are exploring the antecedents and consequences of bootstrapping (e.g., Grichnik, Brinkmann, Singh, & Manigart 2014).

However, after nearly three decades since the seminal publication of Van Auken and Carter (1989) we know far too little about bootstrapping and its antecedents and outcomes. To make matters worse, the extant empirical literature is exceedingly confusing. Vanacker, Maniugart, Meuleman, & Sels (2011) found that extant literature (both theoretical and empirical) painted inconsistent pictures, with some work supporting the notion that bootstrapping constrains firm performance and other work espousing that bootstrapping enhances firm performance. For example, empirical results can show that bootstrapping has a positive impact on firm performance (e.g., Jones & Jayawarna 2010; Jayawarna, Jones, & Macpherson 2011; Vassolo, Weisz, & Muñiz 2005), a negative impact on firm performance (e.g., Rutherford et al., 2012), no impact (Perry, Chandler, Yao, & Wolff 2011), or both (e.g., Ebben 2009; Fitzsimmons 2007).

This muddled collection of findings is confusing for scholars, entrepreneurs, and policy makers alike. Our study undertakes a meta-analysis of the extant empirical research to sort out this empirical quandary. The overall model we explored is shown in Figure 1.

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Insert Figure 1 about here
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2. Theoretical Context: Bootstrapping

Although there are multiple ways in which emerging ventures bootstrap (e.g., Jones & Jayawarna 2010), the preponderance of these behaviors are captured by Winborg and Landström’s (2000) framework, which includes: (a) customer-related bootstrapping (also termed the “minimizing bootstrapper”), which is the practice of working hard to keep accounts receivable and inventory to the lowest levels possible, (b) delay payment, which is the relatively common practice of delaying payments to affect the cash cycle in the entrepreneur’s favor, (c) owner-related, which is where the owner simply eschews external finance instead relying on personal resources, and (d) joint utilization, which is where entrepreneurs share resources to contain and reduce costs.

However, although we have some clarity on what bootstrapping is, there are conflicting theoretical arguments as to what the relationship between bootstrapping and SME performance might be. We briefly outline these perspectives below.

2.1 SMEs, resource constraint, and bootstrapping

One common characteristic of SMEs is that they exist in a severely resource-constrained environment (Baker & Nelson, 2005; Wiltbank, Dew, & Read, 2015). And, despite this substantial disadvantage there are firms that survive and thrive in such an environment. However, with regards to the theory that is applicable to such an environment, there is not a consensus as to what theory would predict. On one hand, we have theories that suggest that engaging in bootstrapping will not enable a SMEs to survive and thrive. In particular, a resource based view (RBT) perspective applied to bootstrapping would focus on whether or not bootstrapping fosters a sustainable competitive advantage. The crux of this approach in the bootstrapping context is the characterization of resources as: (a) valuable, (b) rare, (c) inimitable,
and (d) non-substitutable (Alvarez & Busenitz 2001; Barney 1991). Although the behavior of bootstrapping may be valuable (i.e., some needed resources are acquired), it is not rare (over 75% of firms bootstrap). And, it is not inimitable (there are multiple ways to imitate the behavior) and it is not non-substitutable (i.e., multiple substitutions exist). Accordingly, bootstrapping should not be positively related to performance.

Similarly, knowledge based theory (KBT) complements the resource-based view of bootstrapping and proposes that knowledge, which resides in people, enables a firm to attain competitive advantage (Grant 1996; Lepak & Snell 1999). Our review of bootstrapping techniques (see also Winborg & Landström 2000) indicates that the knowledge required for many bootstrapping activities appears to be largely explicit and non-technical (e.g., use of manager’s credit card, withhold manager’s salary, ceasing business relations with late payers, collaborating with peers). Accordingly, knowledge based theory—similar to RBT—suggests that the resources created by bootstrapping will have little strategic advantage because, while they may add some value, they can be easily copied or trumped by competitors.

On the other hand, we have theories suggesting that engaging in bootstrapping will indeed enable a SME to survive and thrive. In contrast to RBT and KBT, these theories view bootstrapping as a creative approach to addressing the disadvantages of resource constraint. Rather than taking the very limiting view as organizations “either having the resources they need or they do not” (Baker & Nelson, 2005, p. 331), resource dependence theory (RDT; Pfeffer & Salancik 1978) and resource constraint theory start from the assumption that organizations rely on resources that are typically not possessed by the firm. Accordingly, firms must acquire resources creatively (Ebben & Johnson 2006; Jones & Jayawarna 2010; Pfeffer & Salancik 1978). Given the fact that SMEs typically have little leverage in acquiring resources from
external financiers, they engage in strategic bootstrapping (Rutherford, 2015) to mitigate their dependency on external financiers, thus ostensibly improving their chances of survival and growth (Ebben & Johnson 2006). They do this by acquiring other types of resources (i.e., social and human), that allow them to overcome a lack of financial capital. Bootstrapping is, from a RDT perspective, a natural and common—even, perhaps, optimal—path for new and small ventures to pursue.

Resource constraint theory (RCT) coincides with RDT, suggesting that firms with resource constraints can identify approaches to (a) efficiently use limited amounts of available resources, (b) to access valuable resources by utilizing their social network, and (c) to thrive by reconfiguring their current resources and exploiting social and institutional inputs that other firms may fail to recognize (Baker & Nelson 2005; Jones & Jayawarna 2010; Leibenstein 1976; Vanacker et al., 2011). Thus, bootstrapped firms, albeit having limited resources, can still compete with more resource wealthy firms by searching for innovative ways to sustain growth and/or by finding approaches to stretch and leverage their resources (Baker & Nelson 2005; Mosakowski 2002; Vanacker et al. 2011).

Overall, our perspective on the extant literature is that RBT and KBT provide a limited viewpoint by which to examine bootstrapping. In both of these perspectives, resources are pre-specified and approached as being possessed by the firm already.¹ This is the antithesis of the resource-constrained environment in which SMEs find themselves. Accordingly, we suggest that approaching bootstrapping from the perspective of resource constraint provides a path to reconcile the notion that bootstrapping can lead to either negative (i.e., no competitive advantage and decreased performance) or positive (e.g., creative survival). In sum, considering the

¹ We thank our editorial team for helpful comments here.
conflicting theoretical and empirical evidence, our primary research question in the present
research is:

*Research Question: What is the relationship between bootstrapping and SME performance?*

In addition, we also explore the antecedents to bootstrapping, as well as potential
moderators of the bootstrapping-performance relationship.

**4. Methods**

**4.1 Literature search and inclusion criteria**

Our search queried the usual plethora of databases (e.g., *Google Scholar, ProQuest Dissertations and Theses*, and *Social Science Citation Index*) for the individual terms and combinations of: bootstrap(ping), financial, venture, firm, startup, business, small, finance, financing, strategy, strategic, entrepreneurial, entrepreneur, SME(s), family, owner, resources, and self-finance. We also searched major journals in entrepreneurship, management, and strategy as well as major conferences related to these areas. We also backtracked the references and citations of two seminal articles (i.e., Bhide 1992; Winborg & Landström 2001) as well as contacted specific scholars to request unpublished/working papers, raw data, and missing data from relevant papers. Our search revealed 1,037 possibilities as of January, 2015.

To be eligible for inclusion, studies needed to (a) be empirical and quantitative, (b) focus on SMEs (less than 500 employees; Stam, Arzlanian, & Elfring, 2014), (c) report at least one

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2 The cut-off values to determine whether a firm is SME vary across countries—250 employees is a cut-off value used in European Union; 500 employees is a cut-off value used in U.S. In line with prior research (e.g., Rosenbusch, Brinckmann, & Bausch, 2011), we defined SMEs as firms less than 500 employees because most of the included studies were based on the samples from U.S. In terms of the distribution of firm size for included studies, 68% of them reported they sampled small firms and 32% of them reported they sampled SMEs. Within 68% of the included studies that sampled small firms, the distributions of average firm size of sampled firms are: 13% for less than 10 employees, 13% for between 10 and 20 employees, 13% for between 20 and 50 employees. The remaining 61% of them either indicated the sampling of small firms without providing exact firm size or sampled the firms with average firm size less than 100 employees or with average firm size more than 100 employees.
effect size between any one of the antecedents (i.e., gender, owners’ age, firm size, firm age\(^3\), human capital, and social capital) and bootstrapping and/or between bootstrapping and SME performance.\(^4\) Additionally, each effect size needed to be from an independent sample.\(^5\) We found 22 studies and 62 effect sizes that met these criteria. Table 1 lists all included studies.

![Insert Table 1 about here]

4.3 Antecedents and moderators

We coded data for all variables shown in Figure 1. Two of our authors confirmed the accuracy of the data we collected—and, no subjective decisions were made (i.e., we did not calculate an inter-rater reliability statistic). The coding of effect sizes for antecedents involved characteristics such as gender, owners’ age, firm size, and firm age. We coded human capital in reference to Becker’s (1964) conceptualization of human capital. And, we coded social capital in accordance with Nahapiet and Ghoshal’s (1998) conceptualization of social capital. We also coded data for multiple moderators: (a) firm performance (growth, profitability, and others), (b) bootstrapping types, (c) bootstrapping measure used.

4.4 Meta-analytic procedures

We performed psychometric meta-analysis developed by Hunter and Schmidt (2004). We also corrected for measurement errors in both independent and dependent variables for each effect size. We computed corrected 95% confidence intervals to gauge the statistical significance

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\(^3\) We used firm age to determine whether the samples are entrepreneurial firms. Prior research suggested young and entrepreneurial firms are the ones having 8 years or less of firm age (see Rutherford, Tocher, Pollack, & Coombes [2016] for detailed discussion). 41% of the included studies reported the average age of sampled firms. Within this 41% of these studies, 33% of them met the aforementioned criterion of young and entrepreneurial firms.

\(^4\) When needed, we employed Lipsey and Wilson’s (2001) as well as Peterson and Brown’s (2005) methods to perform effect size conversion.

\(^5\) We used detection methods developed by Wood (2008) to locate and remove duplicate samples reported in two or more papers. We identified two instances (5 papers in total, with 2 papers for the first instance and 3 papers for the second instance) that were based on the same sample. We combined these papers, extracted each article’s unique effect sizes, and include them only once in each meta-analytic distribution to ensure sample independence.
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of effect sizes. We calculated both Var_{art} and 80% credibility intervals to assess the potential presence of moderators. Moderators may operate in meta-analytic distributions if statistical artifacts account for less than 75% of the variance in the meta-analytic effect sizes (Hunter & Schmidt, 2004). Whitener (1990) suggested that a wide 80% credibility interval signals the possible presence of moderators in the meta-analytic distribution. We performed subgroup analysis based on z-test (Hunter & Schmidt, 1990) to assess moderator effects.

5. Results

The results of the present research are shown in Table 2. We found that there was a non-significant relation between bootstrapping and firm performance ($\tilde{r}_o = .002, \beta = .002, k = 17, N = 7,107$, corrected 95% CI: -.027 to .032).\(^6\)

With regard to the antecedents of bootstrapping, we found a positive relation between firm age and bootstrapping ($\tilde{r}_o = .096, \beta = .122, k = 11, N = 2,264$, corrected 95% CI: .072 to .172). We found a nonsignificant effect between firm size and bootstrapping ($\tilde{r}_o = .015, \beta = .019, k = 11, N = 2,409$, corrected 95% CI: -.004 to .041). There was a positive relation between human capital and bootstrapping ($\tilde{r}_o = .070, \beta = .083, k = 11, N = 2,272$, corrected 95% CI: .034 to .132) in terms of educational level ($\tilde{r}_o = .118, \beta = .126, k = 9, N = 1,740$, corrected 95% CI: .076 to .176), entrepreneurial experience ($\tilde{r}_o = .057, \beta = .062, k = 6, N = 1,324$, corrected 95% CI: .047 to .078), and management experience ($\tilde{r}_o = .036, \beta = .043, k = 4, N = 1,115$, corrected 95% CI: .026 to .060). There was a positive relation between social capital and bootstrapping ($\tilde{r}_o = .116, \beta = .122, k = 3, N = 744$, corrected 95% CI: .103 to .141) in terms of strong ties ($\tilde{r}_o = .101, \beta = .100, k = 3, N = 744$, corrected 95% CI: .069 to .130), and weak ties ($\tilde{r}_o = .128, \beta = .139, k = 3, N = 744$, corrected 95% CI: .116 to .162). Gender was not related to bootstrapping

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\(^6\) Subgroup analysis (published vs. not published) revealed no significant differences. Egger’s test of the intercept ($B_0 = 1.636$), Begg and Mazumdar’s rank correlation test (Kendall’s tau = .199), and trim and fill analysis (no missing samples were imputed) illustrated further that this sample distribution is robust to publication bias.
We found that owner’s age was negatively related to bootstrapping ($r_o = -.126, \beta = -.147, k = 5, N = 1,303$, corrected 95% CI: -.180 to -.115).

With respect to moderator effects, regarding type of performance measure used, growth measures were not significant ($r_o = -.003, \beta = -.004, k = 6, N = 4,758$, corrected 95% CI: -.036 to .029) though profitability measures were ($r_o = -.032, \beta = -.032, k = 3, N = 3,780$, corrected 95% CI: -.043 to -.021). The difference in effect sizes, however, across type of performance measured was not significant. Regarding bootstrapping type, only one, owner-related ($r_o = -.006, \beta = -.004, k = 11, N = 5,200$, corrected 95% CI: -.043 to .035), was not significant, whereas customer-related ($r_o = .025, \beta = .042, k = 6, N = 1,016$, corrected 95% CI: .007 to .077), delay payment ($r_o = .118, \beta = .158, k = 8, N = 1,462$, corrected 95% CI: .108 to .208), and joint utilization ($r_o = .037, \beta = .039, k = 7, N = 1,227$, corrected 95% CI: .014 to .064) were positively related to performance. The difference in effect sizes across bootstrapping types was not significant. Both bootstrapping measure categories, Winborg and Landström (2000) ($r_o = -.004, \beta = -.007, k = 6, N = 901$, corrected 95% CI: -.022 to .009) versus other ($r_o = .003, \beta = .003, k = 11, N = 6,206$, corrected 95% CI: -.027 to .034), were not significant. The difference in effect sizes across bootstrapping measure categories was not significant.

6. Discussion

In the present work, we summarize in a meta-analytic framework the nomological network of bootstrapping as it relates to SME performance. We found that there was not a significant relation between bootstrapping and firm performance. Although the overall relation of
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Bootstrapping-performance was not significant, we do find that bootstrapping is negatively related to profitability measures (e.g., ROA). It is important to note that there is no moderator effect for type of performance measure, but the main effect of bootstrapping on profitability is interesting. This negative relation with profitability bolsters the claim that bootstrapping, on average, may constrain a firm’s ability to engage customers—this lends tentative support to the perspectives of RBT and KBT with regards to bootstrapping.

We found that three (of the four) types of bootstrapping are positively related to performance (i.e., owner-related was the sole exception). Although there was no overall moderating effect, the positive main effects we found offer credence to the notion that not all bootstrapping tactics are created equal. For example, simply avoiding external finance (i.e., owner-related) seems to offer little advantage to small ventures in terms of performance. In contrast, actively engaging in cost-reducing (i.e., customer-related), delay payment, and sharing (i.e., joint utilization) very well may provide real returns in terms of performance.

With regard to antecedents, we find that firm age, human capital, and social capital are all positively associated with bootstrapping. Owner’s age, on the other hand, is negatively related to bootstrapping. Taken together, these findings bolster work that has been done regarding the relation between human and social capital as antecedents to positive venture outcomes—in particular, we find support for the notion that a firm endowed with human and social and capital may have a lesser need to raise financial capital via bootstrapping activities.

6.1 Implications for practice

Our finding that bootstrapping is not significantly related to SME performance is important for academics and practitioners alike. In particular, scholars and practitioners on both sides—those who claim that bootstrapping is the path to pursue, and those who claim it is not—
may need to temper their arguments. Bootstrapping represents one option to meet the resource needs required to survive and grow—it is a *proactive strategy deliberately chosen* by entrepreneurs, not simply a response to environmental demands (Winborg, 2009). And, given that it is a choice, our findings offer some insights as to when this choice may be optimal or not.

Whether or not bootstrapping represents an optimal choice depends on multiple factors. First, the bootstrapping choice may be affected by which performance metric is being used—in particular, bootstrapping is negatively related to profitability measures. Thus, if profitability is the primary metric of interest, bootstrapping may not be an optimal choice. And, the bootstrapping choice may be affected by type of bootstrapping is used. As noted above, avoiding external finance (i.e., owner-related) seems to offer little advantage, whereas engaging in cost-reducing (i.e., customer-related), delay payment, and sharing (i.e., joint utilization) may provide performance advantages. And, also as noted above, it seems to be the case women may see greater performance benefits from bootstrapping. Considering these findings, the present work provides clear insights into when and how bootstrapping may be an optimal choice.

6.2 Implications for theory

Our work brings to the forefront the seemingly irreconcilable conclusions that RBT and KBT versus RDT and RCT draw regarding resources in emerging ventures. On one hand we can conclude that bootstrapping cannot create competitive advantage—on the other hand, we may conclude that it can. Given our findings, one theoretical query is: “Can financial constraints, and subsequent bootstrapping behavior, lead to an enhanced social or human capital, via highly creative means, that would meet the criteria of RBT as a competitive advantage?” For example, an entrepreneur with superior local knowledge (i.e., human and social capital) developed by engaging in bootstrapping, may be able to take advantage of an arbitrage opportunity with little
financial capital (e.g., Carter & Van Auken, 2005; Dimov, 2010; Kirzner 1973). Moreover, the lack of financial capital may actually result in the entrepreneur developing superior human and social resources, again from engaging in bootstrapping, to make up for a financial deficiency (e.g., Seghers, Manigart, & Vanacker 2012). There are certainly examples of firms that have accomplished exactly this and have become more creative via bootstrapping (i.e., Baker, 2007). Yet, from a theory-based perspective, RBT and KBT need to be tested against RDT and RCT as it may also be the case that lack of financial resources stifles creativity and fosters higher failure rates (Shane, 2000). Future theory-based work is encouraged to examine the ways in which RBT and KBT can be reconciled with RDT and RCT regarding what advantages (if any) can be gained by financial constraints and subsequent bootstrapping behavior.

6.3 Limitations and future directions

We had an insufficient number of samples for some of our moderator distributions. Although there is no general agreement in terms of the number of studies that would make a meta-analysis worthwhile, it appears that researchers have adopted a minimum of 3 samples for a meta-analysis (Wang, Holmes, Oh, & Zhu, in press). This rule works fine for bivariate meta-analyses and the size of meta-analytic distributions of bivariate relationships in our study ranges from 3 to 17 samples. Nevertheless, more samples are always better to analyze moderators because moderator analysis in meta-analysis is a low power test (Steel & Kammeyer-Mueller, 2002). This may partly explain why a majority of our hypothesized moderators were not significant even if they influenced the direction and statistical significance of overall relation. We, thus, encourage readers to exercise caution when interpreting our results. In spite of this limitation, our preliminary meta-analysis is still conducive to advance the bootstrapping
literature by providing an interim assessment of literature and highlighting the areas where more research is needed (Garrett, Miao, Qian, & Bae, 2017; Thundiyil et al., 2015).

Related, although we attempted to investigate a set of moderators in the present study, there are still substantial variations across effect sizes in some meta-analytic distributions; as such, future studies should further explore these unobserved influences that condition the relations among the variables in the nomological network of bootstrapping.

Due to limitations within the literature—lack of studies—we could not examine all the relations we felt were relevant. For example, industry of emerging ventures would be a productive aspect of the bootstrapping-performance relation to explore when enough studies enter into the literature to sustain analysis here (e.g., Van Auken, 2005). And, we only examined financial performance in the present work. We encourage future work to examine other types of performance as they relate to bootstrapping. For example, bootstrapping may negatively affect profitability, as we found, but bootstrapping could positively influence non-financial performance (or outcomes) such as satisfaction, persistence, passion, and engagement.

Here, it is important to reflect on the difference between measures of growth and measures of profitability. Recent literature has explored the distinction between firms that aim to use acquired resources quickly to achieve growth and exit—termed “burners,” versus firms that aim to grow revenue, assets, and long term value—termed “earners” (Wiltbank et al., 2015, p. 20). Given that these firms exist in a severely resource-constrained environment, bootstrapping firms fall more closely into the category of “earners.” Put differently, bootstrapping may not be about profitability but rather growth. Only over time, once a firm has ensured its survival via growth might a venture look to optimize profitability. An opportunity for future research is to
examine a longitudinal model in which bootstrapping firms transition from focusing on survival (i.e. growth) to profitability.\footnote{We thank our editorial team for insights here.}

Moving forward, we encourage a greater focus two additional areas. First, future work should explore how bootstrapping affects other stakeholders including, for example, employees and suppliers (e.g., Fattouh, Scaramozzino, & Harris 2005). Second, an opportunity resides in the fact that our meta-analysis was dominated by studies using cross-sectional designs. Future studies should conduct longitudinal studies to deal with this limitation and to draw robust causal inferences.

To conclude, We hope that the present insights into the behavior of bootstrapping provide the foundation for future work in this, and other areas, related to the strategic choices entrepreneurs make which can increase chances for success.
References

Studies noted with (*) refer to the ones included in the meta-analysis.


Table 1. A list of the studies included in meta-analysis

<table>
<thead>
<tr>
<th>Author Name(s)</th>
<th>Year</th>
<th>Publication Status</th>
<th>Country</th>
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<th>Bootstrapping Measures</th>
<th>Antecedents</th>
<th>Performance Indicators</th>
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<td>Bosse &amp; Arnold</td>
<td>2010</td>
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<td>W&amp;L</td>
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<td>US</td>
<td>146</td>
<td>W&amp;L</td>
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<td>Australia</td>
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<td>Published</td>
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<td>W&amp;L</td>
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Table 2. Psychometric Meta-Analysis Results

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<th>$r_o$</th>
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<th>$SD_{\hat{\beta}}$</th>
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Note. $k$ = number of independent samples; $N$ = sample size; $r_o$ = uncorrected sample-size-weighted mean correlation; $SD_r$ = sample-size-weighted standard deviation of observed mean correlations; $\hat{\beta}$ = corrected sample-size-weighted mean correlation; $SD_{\hat{\beta}}$ = sample-size-weighted standard deviation of corrected mean correlations; Var$_{art}$% = percent of variance in $\hat{\beta}$ explained by statistical artifacts; Corrected 95% CI = corrected 95% confidence interval; Corrected 80% CR = corrected 80% credibility interval; Significant Difference = letters in this column correspond to the letters in rows and demonstrate that effect sizes are significantly different from one another at .05 level. The letter “-” indicates there is no significant between-group difference. Z-test was used to evaluate the statistical significance of between-group difference in effect sizes.
Figure 1. A conceptual model of the nomological network of bootstrapping.