International Journal of Business Science and Applied Management

A fresh approach to business and management research

www.business-and-management.org

ISSN 1753-0296
Listed firm’s level of stakeholder transparency - The comply or explain evidence from the Danish corporate governance code

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Abstract

This article analyzes how Danish listed firms comply with the Danish Corporate Governance Code’s recommendations regarding the categories: Role of shareholders, role of stakeholders and transparency. It is shown that the number of recommendations can be explained by six different underlying factors which account for the vast majority of the variation. The analysis reveals that the official classification of the three different sections in the Danish corporate governance must be abandoned. It is interesting to note that even though the “comply or explain” principle assumes that a meaningful explanation is equally good as compliance - the analysis documents that the vast majority of the firms complies with the recommendations. The article introduces a new methodology to measure the degree of compliance within these specific areas. This categorization serves as input for a multivariate analysis that explores how the different recommendations covariate as well as can be placed into distinct discrete groups. The policy implication is that future code revisions should rely on a multivariate approach when seeking to classify and structure the different code sections regarding the firm’s stakeholders. Otherwise, there is a risk that board members may associate a large number of recommendations as mechanistic “tick the box” exercises, which does not add value.

Keywords: corporate governance, transparency, compliance, comply or explain, factor and cluster analysis

Acknowledgements: I am grateful to Nicolai Søpstand for excellent and careful research assistance.
1 INTRODUCTION

During the last decade most developed countries have issued their own corporate governance codes that vary in scope and size accordingly to institutional differences, but transparency is an important common denominator, see Aguilera and Cuervo-Cazurra (2009) for an overview. The main objective of such recommendations is to increase investor confidence assuring that executive management and board members serve the interests of shareholders by providing sufficient of information about a firm’s corporate governance structure. Transparency is a key ingredient facilitating shareholders to actively participate at the AGM or alternatively at investor meetings. However, transparency is not only relevant towards the owners, but also in relation to a number of other key stakeholders see e.g. Freeman (1990) such as creditors, customers, suppliers, the local community, NGOs, the media etc.

There has been a relatively large attention to the potential value effect of corporate governance compliance, while there is only little evidence on how the different individual recommendations vary and covariate as well as can be classified into distinct groups. This article analyzes Danish firm’s corporate governance compliance. Furthermore, it also presents a novel study of the interrelationship between the individual recommendations in the first three sections of the Danish corporate governance code.

Effective communication with different stakeholders is vital in order to build trust as well as to create visibility on the stock exchange. Listed firms, especially smaller firms may find it difficult to attract and maintain investor’s attention. As a consequence, a firm must not only identify its key stakeholders, but it also needs to evaluate the different stakeholders relative importance for the firm’s ability to run it’s business, which may be expressed as their “license to operate” as a publicly listed company.

National corporate governance codes seek to accomplish similar goals but their structure and content e.g. on transparency varies substantially.

The point is that the notion of transparency in the form of soft law is interpreted differently in different countries. Moreover, transparency in the Danish code is considered to be broader as it does not rely on a narrow legal perspective. In the UK, the traditional corporate governance code is even supplemented with a stewardship code that contains specific recommendations to investors in the listed companies. The purpose is to formulate good practice that aspire investors. The disclosure by investors will assist companies to understand the approach and expectations of their major shareholders. The Financial Reporting Council states that the recommendations “will assist those issuing mandates to asset managers to make a better informed choice, assist managers to understand the expectations of current and potential clients, and may help investors interested in collective action to identify like-minded institutions” (Homepage of FRC).

The Danish corporate governance code was introduced in 2001 and during the following years it has undergone major changes. The code is soft law and builds on the “comply or explain” principle. The formal work of developing and maintaining the Danish Code is delegated to the Danish Corporate Governance Committee which consists of representatives from the listed firms, investors as well as advisors. The Committee emphasizes that “Transparency is essential to ensure that shareholders and other stakeholders are able to evaluate the performance of publicly traded companies.” (page 3 in the Code recommendation from April 2010).

The Danish Code consists of 9 separate sections dealing with different aspects of corporate governance. This article focuses on the first three sections i.e. the role of shareholders and their interactions with the management of the company, the role of stakeholders and their importance to the company’s corporate social responsibility as well as openness and transparency.

The vast majority of national codes are typically quite comprehensive since they contain a large number of specific recommendations that the board of directors must adhere to or alternatively give a reasonable explanation why a firm has decided not to follow “best practice”, see Bauwhede and Willekens (2008). As a consequence, there is a potential risk that too many detailed recommendations could stimulate a “tick the box” mindset in which formality gets first priority at the expense of substance. By substance is meant that board member’s norms are changed in order to stimulate an effective mechanism to discipline a certain type of behavior, see Fasterling (2012).

The article is organized as follows. A literature overview is presented in the next section which is followed by a description in section three of the data as well as the methodology to quantify the level of compliance. The degree of stakeholder compliance of Danish firm’s is presented in section four. The results of the multivariate analysis are presented in section five. The article ends with a conclusion and discussion.

2 LITERATURE

Fasterling (2012) links norms to companies’ compliance disclosure where he argues that disclosure regimes may have negative effects if disclosure addresses use disclosed information without questioning it. The author points to an interesting key point i.e. if there is no legal obligation to “comply or explain”, a company could decide to send a positive signal to the public by voluntarily stating its compliance with a well-reputed corporate
governance code. In essence the author argues that compliance disclosure regimes could provide specific opportunities for explicit and empirically traceable public discourse on applicable normative standards and thereby facilitate the identification of adequate norms for regulating business activities.

The notion of soft law in relation to compliance is analyzed in Hooghiemstra and van Ees (2011) who analyze a sample of 126 listed Dutch firms. They find that the overall compliance rate is quite high arguing that firms fear about their reputation if they score low. However, they reveal that firms tend to use similar arguments for non-compliance, hence the authors argue that the uniformity in adopting the standard of good corporate governance may not be in line with the logic of corporate governance codes, which may casts doubt on the effectiveness of using soft law.

2.1. Empirical studies

There are several studies that link corporate governance with firm performance, see e.g. Bozec and Dia (2012), Gutierrez, Isabel and Jordi Surroca (2012), Seidl and Roberts (2013), Sanderson et al. (2010) and Werder and Talaulicar (2005). However, there are a quite few studies that study compliance patterns using multivariate statistics. An exception is Talaulicar and Werder (2008) who rely on cluster analysis to identify discrete groups of companies with similar patterns of code compliance. They find eight patterns of compliance which are characterized by distinct forms of code conformity. Specifically, the authors investigate whether the form of compliance with the recommendations of the German Corporate Governance Code appears to be idiosyncratic to a specific company or feature similarities across firms. The authors find that the cluster solution does not merely reflect the number of rejected code recommendations. Rather, companies with very similar rates of overall compliance with the German code are assigned to different clusters because they feature different patterns of conformity.

The issue of measurability of corporate governance compliance is crucial in the analysis. If one does not quantify the compliance in a coherent and systematic way, any result may offer poor guidance for future policy recommendations within this important area of research. Tsipouri and Xanthakis (2004) discuss this issue in their analysis of how Greek companies adhere to the OECD guidelines. They find that Greek companies demonstrate a fairly satisfactory degree of compliance although areas such as the role of stakeholders and CSR score relatively low.

According to the authors, the merit of the exercise from a methodological perspective comes in its approach towards the creation of “collectively subjective” weightings i.e. an effort to discuss the benefits of separating the rating of the market from the rating of the companies.

2.2 Transparency studies

Bushman et al. (2003) conduct a large study of transparency which the authors define as the availability of firm specific information to those outside publicly listed firms. The authors rely on a factor model of transparency measures worldwide in order to analyze the underlying structure. Specifically, they find that their factor analysis isolates two factors from the array of country-level measures of the firm-specific information environment. The first factor, interpreted as financial transparency, captures the intensity and timeliness of financial disclosures, and their interpretation and dissemination by analysts and the media. The second factor, interpreted as governance transparency, captures the intensity of governance disclosures and, to a lesser extent, the intensity and timeliness of financial disclosures used by outside investors to hold officers and directors accountable. Thus, the authors investigate whether these factors vary with countries’ legal/judicial regimes as well as political economies. Their main statistical result is that the governance transparency factor is primarily related to a country’s legal/judicial regime, whereas the financial transparency factor is primarily related to political economy. The authors use six different measures to quantify the corporate reporting environment in combination with dissemination of information by the media. One may always discuss how transparency is measured, but the authors results are interesting and highly relevant as the authors are some of the very few scholars who rely on multivariate analysis of firm transparency within corporate governance.

The link between transparency and financial ratios has been studied by Adiloglu and Vuran (2012) who study transparency in listed Turkish firms. They argue that high compliance with the corporate governance standards means more accountable and transparent companies for investors. Specifically, they conduct MANOVA analysis to examine the relationship between the calculated transparency levels and financial ratios. The results reveal that transparency level has statistical differences among the group means of return on asset, total debt/total assets, long-term debt/total assets and corporate governance index variables.

The challenge of how to measure transparency in corporate governance context is also analyzed by Stefanescu (2014) who study corporate governance disclosure in the EU in relation to how firms comply with the OECDs corporate governance guidelines. The author develops a disclosure index which consists of subindices within different categories such as owners, boards, executives, committees and stakeholders. Stefanescu measures how close each code in the sample was to the recommendations for good corporate governance using Jaccard’s similarity coefficient in order to measure the disclosure level. Their results reveal that those codes
developed through the collaborations of a wider range of specialist from various economic fields and issued by special committees set for this purpose appeared to best approximate the ideal model of best practices for corporate governance transparency/disclosure.

There are several studies that seek to explore the link between financial performance and the level of corporate governance compliance. However, these studies do not offer a coherent methodology for quantifying or measuring the degree of compliance. The issue of transparency is the focus of the second category of studies that rely on quantitative studies. The aim is to obtain a better understanding of the notion of transparency, but there seems not to be common line of research within this group. This article seeks to fill this research gap.

3 DATA AND METHODOLOGY

This article analyzes the governance practices associated with the Danish corporate governance recommendations introduced in April 2010. This version of the governance recommendations apply to all listed companies with fiscal years ending in 2010 or mid 2011 (hereafter; fiscal year 2010). Thus, this article addresses the fiscal year 2010 (ranging from the calendar year 2010 as well as the period mid 2010/2011).

When evaluating the companies with respect to corporate governance practices the analysis relies on all relevant publicly available information. The main sources of information are reported governance practices, relevant material on the companies’ web pages, and annual reports for the fiscal years 2010. The data has been carefully manually collected.

There are six specific recommendations regarding the role of shareholders, three on the role of stakeholders and transparency as well, see Recommendations on Corporate Governance (2010).

All companies have been assessed based on how they communicate their governance practices using a binary scale of 0 or 1 point for each recommendation. If a company has chosen to comply with a given recommendation, and this can be verified, the company receives a score of 1 (denoted: Complies). If a company claims to comply but its practice proves otherwise it receives a score of zero (Complies poorly). Companies that have chosen not to comply with a given recommendation score 1 if the explanation is accompanied by a reasonable argument (Explains). Finally in case a company does not explain why a recommendation is chosen not to be followed, or the explanation does not seem justified, a 0 score is given (Explains poorly). Most recommendations are divided into sub recommendations, but since each of these sub recommendations are considered equally important to those with only a single recommendation, they have all been treated similar, and hence they all count as one each. This is to elude a discussion of the relative importance or weighting of the different recommendations.

The different recommendations vary considerably in nature. Some are easily verified due to being very specific with respect to disclosure, while others are harder to verify. This means that a company who claims to be complying with a non-verifiable recommendation cannot be penalized since it cannot be checked if the compliance statement is in fact true. Companies who have chosen not to comply with such recommendations can be given the score 0 if their explanation is not satisfying.

As per September 2011 there were a total of 188 companies listed on Nasdaq OMX Copenhagen. The final sample consisted of 155 companies. There are five main reasons for this: 1) Some companies are listed with two share classes. 2) Some companies are listed as separate entities, but are in essence organized in a very similar manner. To illustrate, Formuepleje/FormueEvolution consist of a series of listed companies, where the main difference is their investment profile. Including all Formue companies would have yielded the same result for all companies, thus resulting in a total sample score skewed disproportionately towards the score of these companies. 3) Some companies have been liquidated or taken private before we got to assess their governance practices, so information were no longer available. 4) Some companies are also listed in other countries, and have therefore chosen to adhere to other governance frameworks. 5) To ensure the highest possible validity, all companies have afterwards been contacted via e-mail and presented the recommendations where they had been given a score of 0. The companies were given the opportunity to respond, and argue their case, if they believed the evaluation was incorrect. When received the companies’ feedback the initial scores were reassessed, and changed accordingly if the arguments had any merit. In order not to favor companies who responded, all other companies who had been given 0 with respect to these recommendations were also reassessed a second time.

The response rate was less than five percent. In all cases it was observed that only firms with relatively low corporate governance scores did respond. As such, there is an inherent bias in the respond rate, as high complying firms would rarely respond. However, only in a very few cases, we had to change the original assessment.
4 DISCUSSION

This section presents the scores given on the individual recommendations. The following figures measure the percentage of companies on the vertical axis, and the respective recommendations on the horizontal axis. The reader should note that the vertical axis may be truncated in some of the figures in order to make the figures easier to interpret. Each column in the following figures incorporates up to four different assessments of the companies’ attitude towards the respective recommendations, and each column sums to 100%. The list below describes each of the four categories:

- **Complies** = Companies that comply with the recommendation; 1 point.
- **Complies poorly** = Companies claim to comply, but in fact does not; 0 point.
- **Explains** = Companies who do not follow the recommendation and explains well; 1 point.
- **Explains poorly** = Companies who do not follow the recommendation and explains poorly; 0 point.

**Figure 1 Classification of compliance (simple average)**

The classification of the four possibilities is shown in figure A that displays the distribution. The overall impression is that the firms comply (87%) whereas there is a quite equal distribution regarding the three other categories.

4.1. The role of shareholders

The total number of recommendations studied is equal to the number of firms multiplied by the number of recommendations (155 companies x 12 recommendations) i.e. 1380.

**Figure 1 Role of the Stakeholders**

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Explains poorly</th>
<th>Explains</th>
<th>Complies poorly</th>
<th>Complies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.1 Investor relations activities</td>
<td>1%</td>
<td>0%</td>
<td>1%</td>
<td>98%</td>
</tr>
<tr>
<td>1.2.1 Capital/share structure</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>1.3.1 Shareholders’ attendance at AGM</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>1.3.2 Physical/electronic AGM</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>1.3.3 Resolutions to individual items</td>
<td>2%</td>
<td>3%</td>
<td>1%</td>
<td>98%</td>
</tr>
<tr>
<td>1.3.4 Management present at AGM</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
<td>98%</td>
</tr>
</tbody>
</table>
Figure 1 displays the recommendations addressing the role of the shareholders which are generally characterized by a high degree of compliance. Nearly all listed firms have their own IR department or an IR responsible person who may facilitate an ongoing dialogue between the company and shareholders. This may help the board to get a better understanding of the investor’s preferences and expectations.

Active ownership by shareholders can only be formally exercised at the AGM. Shareholders have a number of legal rights such as the right to ask questions, formulate proposals, appoint members of the board, and most importantly the right to vote. Therefore it is positive that all companies seek to promote shareholders attendance at the general meeting.

There is a separation between ownership and control in many listed companies due to the existence of various share structures that allow some shareholders to have more votes than their cash flow stakes. This issue has been debated for several years, especially in the EU. It is documented that in the vast majority of EU member states, a large proportion of listed firms have share structures that deviate from the “one share – one vote” principle, see report by the EU Commission (2007) as well as Rose (2008) for an analysis of the one share – one vote controversy.

Initially, the first Danish corporate governance code viewed such share deviations as harmful hence firms should explain why their share structure deviated from the “one share – one vote” principle. However, this was later considerably modified and the recommendation now states:

“1.2.1. The Committee recommends that the central governing body every year evaluate whether the company’s capital and share structures continue to be in the interests of the shareholders and the company and account for this evaluation in the management commentary in the annual report and/or on the company’s website” (CG 2010, p. 7).

Figure 1 shows that several companies were given a score of 0, despite claiming to comply, which is surprising given the considerable debate about this issue. The main issue here is whether claiming that both share as well as capital structure is deemed to be in the interest of the shareholders, or if more substantive argumentation is warranted. When judging the response to this recommendation it has been decided to follow an approach where deviations from ‘one share, one vote’ require more substantive arguments for why this is the best approach. When it comes to capital structure it is the opinion that investors are capable of making qualified assessments on their own behalf if the current capital structure is reasonable and justifiable.

Most foreign shareholders do not attend the AGM so having the possibility to arrange an AGM electronically is surely an ideal way to promote active ownership and dialogue with top management. The Danish Company Act has for several years offered a legal possibility to arrange an AGM electronically, which has also been enacted by the EU in the Shareholders Rights Directive. However, despite that the legal setup is already in place there are several technical and practical obstacles that are not easily solved e.g. regarding language and practical voting issues, including IT safety. As a consequence, the number of electronically arranged AGMs has been extremely limited so far, but there is reason to believe that this will change in the coming years as firms score extremely high on this matter.

One of the more controversial issues within the Danish corporate governance debate has been the use of “blanco proxies” where the supervisory board sends prewritten proxies based on the company’s shareholder register. Shareholders only need to to sign the proxy form and return it by pre-stamped mail giving the supervisory board authority to vote on all matters in the name of the shareholder. Giving the board “blanco” proxies provides management with a considerable degree of power, so when shareholders are to consider each individual item on the agenda, management may find it harder to “push” their own agenda through at the AGM. Moreover, in a situation of a proxy fight in a hostile takeover this will also weaken target management’s power if it seeks to deter a bidder’s attempt to acquire the firm. Therefore it is positive that so many firms comply with the recommendation to issue proxies with individual items. The Danish code also requires that both the executive board and supervisory board are present at the AGM. Figure 1 shows that this is fully supported by the firms.
4.2. The role of stakeholders

Figure 2 Role of the Stakeholders

Chapter 2 in the Danish Code deals with the role of a firm’s stakeholders. Figure 2 shows that companies have identified their key stakeholders in accordance with 2.1.1 whereas only 15 percent explains poorly on their stakeholder policy i.e. 15% of the companies have chosen to not adopt a stakeholder policy (2.1.2), without explaining convincingly why this approach is chosen.

Regarding the adopting a CSR policy, 21% of the companies have chosen to deviate. Of these companies two thirds, totally 14% of the companies are not arguing reasonably why this approach is chosen. 5% claims to have such a policy, but does not communicate their approach. This is a fairly interesting result, as listed companies are legally required to address CSR. The Danish Parliament has passed a law that requires large firms to report on how their use of CSR can contribute to support responsible growth giving companies a competitive advantage from implementing CSR (policies, actions results and actions). The requirement is codified in the Danish Accounting Act (Årsregnskabsloven) and was enacted January 1. 2009, so companies have had a few years to adapt to the new rules. However, despite the legal obligations, a relatively large proportion of the firms do not address CSR sufficiently, as 14 percent explains poorly and 5 percent complies poorly. This corresponds to the findings by Tsipouri and Xanthakis (2004) mentioned in section 2.1 where the compliance degree within CSR also was found to be relatively poor.

4.3. Transparency

Figure 3 Transparency
Figure 3 addresses transparency, particularly with emphasis on written communication to stakeholders. Most companies have adopted a communication strategy in accordance with 3.1.1.

A large proportion i.e. 38% of the companies has chosen to not communicate information to the market in both Danish and English. Most firms in this group put forth reasonable arguments for choosing this practice. Most companies which do not communicate in both languages have opted to communicate only in Danish. A common argument among this group is that they have a local focus and that targeted shareholders are Danish, which may be challenged as foreign investors now account for more than half of the market cap on the Copenhagen Stock Exchange.

Regarding publishing quarterly reports, close to 23% of the companies have chosen to deviate from this. Around half of these companies have not explained their deviation with reasonable arguments, where typical claims that are made, are that quarterly reports will not contribute with additional valuable information about the company’s situation and prospects.

This article has formulated a new approach to quantify the level of corporate governance compliance. It builds on previous work e.g. by Talaulicar and Werder (2008) and Stafanesco (2014), but it differs in the categorization process, as it relies on a coherent and more dense approach.

5. STATISTICAL ANALYSIS

This article makes use of multivariate analysis or more specifically, principal component, factor and cluster analysis. The primary focus of factor analysis is to explain the interrelationships among a number of original variables. Table 1 shows descriptive statistics for the dataset.

Table 1: Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Std Dev</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investor relations activities</td>
<td>0.980</td>
<td>0.137</td>
<td>156</td>
</tr>
<tr>
<td>Capital/share structure</td>
<td>0.685</td>
<td>0.465</td>
<td>156</td>
</tr>
<tr>
<td>Physical or electronic AGM</td>
<td>0.993</td>
<td>0.080</td>
<td>156</td>
</tr>
<tr>
<td>Proxies to individual items</td>
<td>0.980</td>
<td>0.137</td>
<td>156</td>
</tr>
<tr>
<td>Management present at the AGM</td>
<td>0.993</td>
<td>0.080</td>
<td>156</td>
</tr>
<tr>
<td>Identify key stakeholders</td>
<td>0.980</td>
<td>0.137</td>
<td>156</td>
</tr>
<tr>
<td>Stakeholder policy</td>
<td>0.852</td>
<td>0.358</td>
<td>156</td>
</tr>
<tr>
<td>CSR</td>
<td>0.807</td>
<td>0.395</td>
<td>156</td>
</tr>
<tr>
<td>Communication strategy</td>
<td>0.961</td>
<td>0.192</td>
<td>156</td>
</tr>
<tr>
<td>Danish and English</td>
<td>0.961</td>
<td>0.192</td>
<td>156</td>
</tr>
<tr>
<td>Quarterly reports</td>
<td>0.878</td>
<td>0.328</td>
<td>156</td>
</tr>
</tbody>
</table>

Table 1 shows that the overall compliance within the three sections on transparency is remarkable high. The highest value is Physical or electronic AGM whereas the lowest value concern with companies capital and share structure. Most of the variables are close to one i.e. 100 percent compliance. The standard variation is also quite high among the firms.

5.1 Principal component analysis

The total number of recommendations within the first three chapters in the Danish Corporate Governance Code equals 12 hence we have 12 original variables. Since all firms comply with Shareholders attendance at the AGM, this means that there is no variation and therefore this variable has been excluded from the analysis. In order to simplify the description of the set of board variables, one may wish to transform the 11 variables into new uncorrelated variables called principal components, hence the name principal component analysis. This is an exploratory technique that enables one to reduce the dimensionality of the problem i.e. reduce the number of variables without losing much of the information, see e.g. Chatfield and Collins (1980) for a description of the model, or Rose (2006) for a study of board composition. The model is a mathematical technique, where the researcher does not need to specify any underlying model, such as specifying an “error term”.

The analysis focuses only on the variance, as the mean is normalized to zero. Each principal component is a linear combination of the original variable, and the measure of the information conveyed by each principal is its variance. The principals are arranged in order of decreasing variance. Let $X^T = (X_1,..,X_{11})$ be a 11 dimensional random variable representing the vector of the twelve board variables in the analysis. The problem consists of finding a new set of variables denoted $Y_1,..,Y_{11}$ which are uncorrelated with decreasing variance, from first to last, where $a_j^T$ is a vector of coefficients. Since each $Y_j$ is a linear combination of the $X$’s, we have.
The first principal \( Y_1 \) is found choosing \( a_1 \), so that \( Y_1 \) has the largest possible variance, where the objective function equals \( \text{Var}(Y_1) = a_1^T \Sigma a_1 \), and \( \Sigma \) denotes the covariance matrix, subjected to the orthogonal transformation \( a_1^T a_1 = 1 \), and so forth with \( Y_2 \) etc. (which also is uncorrelated with \( Y_1 \)).

Estimating the components turns out to be identical to finding eigenvalues and eigenvectors (the vector of \( a_j \)'s), where the former is the variance of each component (the sum of eigenvalues equals the original variance).

Table 2 displays the results of the principal component analysis generated by the SAS statistics program.

<table>
<thead>
<tr>
<th>Eigenvalue</th>
<th>Difference</th>
<th>Proportion</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.026</td>
<td>0.676</td>
<td>0.184</td>
</tr>
<tr>
<td>2</td>
<td>1.350</td>
<td>0.186</td>
<td>0.122</td>
</tr>
<tr>
<td>3</td>
<td>1.164</td>
<td>0.041</td>
<td>0.105</td>
</tr>
<tr>
<td>4</td>
<td>1.122</td>
<td>0.097</td>
<td>0.102</td>
</tr>
<tr>
<td>5</td>
<td>1.025</td>
<td>0.022</td>
<td>0.093</td>
</tr>
<tr>
<td>6</td>
<td>1.002</td>
<td>0.142</td>
<td>0.091</td>
</tr>
<tr>
<td>7</td>
<td>0.859</td>
<td>0.114</td>
<td>0.078</td>
</tr>
<tr>
<td>8</td>
<td>0.744</td>
<td>0.049</td>
<td>0.067</td>
</tr>
<tr>
<td>9</td>
<td>0.694</td>
<td>0.056</td>
<td>0.063</td>
</tr>
<tr>
<td>10</td>
<td>0.638</td>
<td>0.266</td>
<td>0.058</td>
</tr>
<tr>
<td>11</td>
<td>0.372</td>
<td>0.033</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Table 2 displays the associated eigenvalues, i.e. how much each principal component explains of the variance in the board data. The first component has a value of 2.026 and this component accounts for 18.4 percent of the variation in the data. Six components (all with a value above 1) seem to explain the interrelation among the variables. These six components explain nearly 70 percent of the variation in the dataset.

5.2 Factor analysis

Factor analysis has been used in many different studies where the aim is to study the underlying structure of a set of variables, see Afifi et al. (2004) for a description of factor analysis. Factor analysis represents each of the variables as a linear combination of a smaller set of common factors plus a unique to each of the response variables. As a consequence, on may wish to use factor analysis, which attempts to explain the correlation between a set of variables, in terms of a small number of factors. Contrary to principal component analysis, factor analysis is not only concerned with explaining the variance, but in particular the covariance structure of the variables. A major assumption is that it is not possible to observe these factors directly i.e. so-called latent variables.

Factor analysis is applied when, e.g. there is not a clear distinction between dependent and independent variables, but when one seeks to explain and identify, which underlying factors that account for the variation among the variables.

The factor model assumes that there are m underlying factors (less than the number of variables), which are denoted \( f_1, f_2, f_m \) and that each observed variable is a linear function of these factors, together with a residual unique factor. The analysis specifies that the number of underlying factors is equal to six, based on the previous principal component analysis, based on the so-called Kaiser’s rule, see Stevens (2002). The model can be written as

\[
\mathbf{x} = \Lambda \mathbf{f} + \mathbf{u} \tag{1}
\]

Let \( \mathbf{x} \) be the vector of the twelve variables and \( \mathbf{f} \) the vector of the six factors with coefficient matrix \( \Lambda \) where \( \lambda_{jk} \) is called the factor loading i.e. the loading on the \( j \)’th variable on the \( k \)’th factor. The vector \( \mathbf{u} \) describes the residual variation specific to the \( j \)’th variable. The six factors are usually denoted the common factors, while the residuals are called the specific factors.

The model relies on a number of assumptions. First the specific factors are assumed to be independent of one another and of the common factors. Thus, the common factors are usually assumed to be independent of each other, although this assumption can be relaxed when the factors are rotated (if an orthogonal rotation is not applied).

Since the variables have been standardized to have zero mean, the factors also have zero mean and unit variance although the variances of the individual factors may vary (let the variance of \( u_j \) be denoted by \( \psi_j \)). From the above assumptions it is easily shown that the covariance of \( \mathbf{x} \), which is denoted as \( \Sigma \) can be written as expression (2), where \( \Psi \) is the off diagonal terms of \( \Sigma \) (the co-variances).
The above equation is of crucial importance, since it demonstrates that the factors explain the off diagonal terms of $\Sigma$ exactly since $\Psi$ is diagonal. This implies that finding the factor loadings is equivalent to factorizing the covariance matrix of $x$ (given that the diagonal elements are non-negative).

In essence, the factor model breaks the variance of each variable into two parts. Since $x_j$ is standardized, its variance equals 1 and is composed of the following two parts:

The communality, denoted by $h^2_j$ for variable $j$, i.e. the variance that is due to the common factors.

The specificity denoted $s^2_j$, i.e. the part of the variance that is due to the unique factor $u_j$.

As a consequence, the variance of variable $x_j = 1 = (h^2_j + s^2_j)$. Table 3 shows the communality estimates.

### Table 3 Final Communality Estimates: Total = 7.691513

<table>
<thead>
<tr>
<th>Investor relations activities</th>
<th>Capital /share structure</th>
<th>Physical or electronic AGM</th>
<th>Proxies to individual items</th>
<th>Manage ment present at the AGM</th>
<th>Indentify key stakeholders</th>
<th>Stake holder policy</th>
<th>Communi cation strategy</th>
<th>Danish Quarterly reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.737</td>
<td>0.564</td>
<td>0.865</td>
<td>0.815</td>
<td>0.805</td>
<td>0.635</td>
<td>0.7220688</td>
<td>0.604</td>
<td>0.647</td>
</tr>
</tbody>
</table>

To illustrate, the six factors explain 74 % of the variation within the IR activities, while they only explain 56 % of the capital/share structure compliance, which is the lowest percentage. Table 3 also shows that the six factors nearly explain 87 % of the total variance in the dataset.

Recall, that the purpose of factor analysis is to identify the underlying factors, which enables the researcher to more easily interpret the common factors. However, the initial factors are often not well suited for identification. As a consequence, the researcher may rotate the initial factors, so that some of the factor loadings are more close to +/- 1, and the rests are closer to zero. Technically, a rotation consists of finding new axes to represent the factors see e.g. Johnson and Wichern (2002).

There are several different rotation methods, but this analysis relies on the so-called verimax procedure that consists of an orthogonal rotation, which does not violate the assumption that the factors are uncorrelated (the communalities are also unchanged when performing verimax rotation).

### Table 4 Rotated Factor Pattern (orthogonal verimax)

<table>
<thead>
<tr>
<th>Factor1</th>
<th>Factor2</th>
<th>Factor3</th>
<th>Factor4</th>
<th>Factor5</th>
<th>Factor6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investor relations activities</td>
<td>0.020</td>
<td>-0.063</td>
<td>0.855</td>
<td>0.001</td>
<td>0.016</td>
</tr>
<tr>
<td>Capital/share structure</td>
<td>0.154</td>
<td>0.277</td>
<td>0.242</td>
<td>0.559</td>
<td>0.301</td>
</tr>
<tr>
<td>Physical or electronic AGM</td>
<td>-0.060</td>
<td>0.006</td>
<td>-0.015</td>
<td>0.008</td>
<td>0.928</td>
</tr>
<tr>
<td>Proxies to individual items</td>
<td>0.029</td>
<td>-0.160</td>
<td>-0.148</td>
<td>-0.078</td>
<td>0.067</td>
</tr>
<tr>
<td>Management present at the AGM</td>
<td>-0.040</td>
<td>-0.124</td>
<td>-0.106</td>
<td>0.875</td>
<td>-0.104</td>
</tr>
<tr>
<td>Indentify key stakeholders</td>
<td>0.759</td>
<td>-0.086</td>
<td>-0.216</td>
<td>0.068</td>
<td>-0.000</td>
</tr>
<tr>
<td>Stakeholder policy</td>
<td>0.746</td>
<td>0.389</td>
<td>0.115</td>
<td>0.011</td>
<td>-0.007</td>
</tr>
<tr>
<td>CSR</td>
<td>0.250</td>
<td>0.726</td>
<td>0.026</td>
<td>0.001</td>
<td>0.301</td>
</tr>
<tr>
<td>Communication strategy</td>
<td>0.640</td>
<td>-0.091</td>
<td>0.426</td>
<td>-0.047</td>
<td>-0.042</td>
</tr>
<tr>
<td>Danish and English</td>
<td>-0.104</td>
<td>0.777</td>
<td>-0.103</td>
<td>-0.008</td>
<td>-0.145</td>
</tr>
<tr>
<td>Quarterly reports</td>
<td>-0.078</td>
<td>0.350</td>
<td>0.356</td>
<td>0.109</td>
<td>-0.146</td>
</tr>
</tbody>
</table>

To interpret what variables with high loadings have in common i.e. to name the factor, one needs to rely on specialist knowledge i.e. in this case knowledge about corporate governance, which inevitably may entail a degree of subjectivity. Moreover, the important thing here is that any judgment can be motivated within a corporate governance framework.

Table 4 displays that the first factor loads strongly on Identify of key stakeholders, Stakeholder Policy and Communication Strategy, issues that may be regarded as stakeholder visibility. The firm must identify its key stakeholders and communicate its stakeholder policy in order to stay visible.

The second factor loads heavily on Danish or English and CSR, which both are issues that are relevant for the firm’s annual accounts, since the firms CSR policy must also be presented in the annual accounts. Therefore this second factor may be interpreted as the Annual account factor.

The third factor loads strongly on Investor Relations Activities and to a lesser extent on Communication Strategy. A firm’s investor relations department/person is responsible for the communication with its
shareholders. A main objective is to make the firm attractive for existing and potential shareholders. Therefore this third factor may be entitled *shareholder visibility factor*.

The forth factor loads on Management present at the AGM as well as Capital/share structure. If a firm decides to change its share capital or capital structure it must be approved by the shareholders at the AGM where the supervisory board must explain the reasons for changing a firm’s capital or share structure. To illustrate, according to Danish law, the AGM can delegate the possibility to issue new shares to the board without asking the shareholders at the AGM.

This delegation of power means that the preemptive rights for the existing shareholders are set aside as management may have discretion to conduct a rights issue to a new shareholder. Therefore this forth factor may be interpreted as the *AGM delegation of power factor*.

The fifth factor may be a bit difficult to interpret, since there is one strong positive factor loading on Physical or electronic AGM, which is followed by two other loadings both on 0.301 regarding Capital/share structure as well as CSR. However, the issues of CSR and Capital/share structure are issues that shareholders must confront its top management with at the AGM. Therefore this factor can be entitled as *AGM accountability factor*.

The last factor loads positively on Proxies to individual items as well as Quarterly reports. This factor may therefore be interpreted as *shareholder information factor*. Both are issues that are of priority when informing the owners i.e. the shareholders about the firms realized financial performance as well as future plans.

Table 5 shows the variance explained by each factor. One notices that there is not a single factor that dominates the variation in the dataset. Instead the six factors are relatively equal in describing the variation since factor 1 accounts for 1.653 whereas the last factor six accounts for 1.079.

### Table 5 Variance Explained by Each Factor

<table>
<thead>
<tr>
<th>Factor</th>
<th>Variance Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor1</td>
<td>1.653</td>
</tr>
<tr>
<td>Factor2</td>
<td>1.546</td>
</tr>
<tr>
<td>Factor3</td>
<td>1.204</td>
</tr>
<tr>
<td>Factor4</td>
<td>1.104</td>
</tr>
<tr>
<td>Factor5</td>
<td>1.103</td>
</tr>
<tr>
<td>Factor6</td>
<td>1.079</td>
</tr>
</tbody>
</table>

### 5.3 Cluster analysis

Cluster analysis is a methodology in which one may try to combine variables into groups when group membership is not known in advance. Cluster analysis may be considered as an alternative to factor analysis although the output is quite different. When the number of variables is limited one may use a scatter diagram, but in this case one needs to rely on other ways of illustrating the grouping of variables. Cluster analysis boils down to the analysis of distance between the variables as variables which are similar are located closer to each other.

The first step is to determine the number of clusters or groups using either hierarchical or non-hierarchical methods. The data is originally divided into three sections i.e. the role of shareholders, the role of stakeholders as well as transparency. Shareholders are by definition a key stakeholder group, since they are the owners of the firm and exercise their rights at the AGM. However, there are also other important stakeholders, so it may be of interest to analyze the number of groups based on the firm’s corporate governance compliance data.

This article uses a methodology entitled K-means clustering which starts by dividing the data into K initial clusters i.e. in this case three clusters. Then the means or centroids of the clusters are calculated and for a given case, the distance to each centroid is calculated. If the case is closest to the centroid of its own cluster, it is left in that cluster, otherwise it is res incumb to the cluster whose centroid it is closest to and the process is repeated. The process successively finds that particular variable and the cluster producing the larger variance and splits that cluster accordingly until K clusters are obtained, see Afifi et al. (2004) for a description. The calculations are done in SAS where the program assigns each observation to the cluster with the nearest seed. The result of the analysis is shown in table that presents the cluster summary.

### Table 6 Cluster Summary

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Frequency</th>
<th>RMS Std Deviation</th>
<th>Maximum Distance from Seed to Observation</th>
<th>Radius Exceeded</th>
<th>Nearest Cluster</th>
<th>Distance Between Cluster Centroids</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>122</td>
<td>0.178</td>
<td>1.370</td>
<td>2</td>
<td>3</td>
<td>1.168</td>
</tr>
<tr>
<td>2</td>
<td>21</td>
<td>0.295</td>
<td>1.306</td>
<td>3</td>
<td></td>
<td>1.073</td>
</tr>
<tr>
<td>3</td>
<td>13</td>
<td>0.338</td>
<td>1.530</td>
<td>2</td>
<td></td>
<td>1.073</td>
</tr>
</tbody>
</table>
The first cluster consists of the largest number of observations namely 122, followed by cluster two and three that consist of 21 and 13 respectively. Table 6 also reveal that the distance between the cluster centroids is quite similar and close to one.

**Figure 7 K means clustering with K = 3. Initial Seeds**

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Investor relations activities</th>
<th>Capital/share structure</th>
<th>Physical or electronic AGM</th>
<th>Proxies to individual items</th>
<th>Management present at the AGM</th>
<th>Identify key stakeholders</th>
<th>Stakeholder policy</th>
<th>CSR</th>
<th>Communication strategy</th>
<th>Danish and English</th>
<th>Quarterly reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>0.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>2</td>
<td>0.0</td>
<td>0.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>0.0</td>
<td>1.0</td>
<td>1.0</td>
<td>0.0</td>
</tr>
<tr>
<td>3</td>
<td>1.0</td>
<td>0.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>0.0</td>
<td>0.0</td>
<td>1.0</td>
<td>0.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Root-Mean-Square Total-Sample Standard Deviation = 0.26
Root-Mean-Square Distance Between Observations = 1.23
Criterion Based on Final Seeds = 0.2156
Table 7 presents how the different variables/recommendations are grouped together. All observations naturally belong to the same cluster if there is only one cluster. However, notice when there are three groups. All the variables: Physical/electronic AGM, Proxies to individual items, Management present at the AGM, Stakeholder policy, Communication strategy and Danish/English annual account now joins group two. The third group is joined by the following variables: Investor relation activities, CSR, Quarterly reports but group three is also joined by Physical/electronic AGM, Proxies to individual items, Management present at the AGM and Danish/English annual reports. Only the variable Capital/share structure remains in group one. This means that we end up having seven variables in group three and three variables in group two and a single variable in group one.

Figure 8 Statistics for Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total STD</th>
<th>Within STD</th>
<th>R-Square</th>
<th>RSQ/(1-RSQ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investor relations activities</td>
<td>0.137</td>
<td>0.136</td>
<td>0.025</td>
<td>0.026</td>
</tr>
<tr>
<td>Capital/share structure</td>
<td>0.465</td>
<td>0.390</td>
<td>0.306</td>
<td>0.441</td>
</tr>
<tr>
<td>Physical or electronic AGM</td>
<td>0.080</td>
<td>0.078</td>
<td>0.041</td>
<td>0.043</td>
</tr>
<tr>
<td>Proxies to individual items</td>
<td>0.137</td>
<td>0.138</td>
<td>0.005</td>
<td>0.005</td>
</tr>
<tr>
<td>Management present at the AGM</td>
<td>0.080</td>
<td>0.080</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Indentify key stakeholders</td>
<td>0.137</td>
<td>0.122</td>
<td>0.215</td>
<td>0.275</td>
</tr>
<tr>
<td>Stakeholder policy</td>
<td>0.355</td>
<td>0.222</td>
<td>0.612</td>
<td>1.582</td>
</tr>
<tr>
<td>CSR</td>
<td>0.395</td>
<td>0.286</td>
<td>0.480</td>
<td>0.924</td>
</tr>
<tr>
<td>Communication strategy</td>
<td>0.192</td>
<td>0.163</td>
<td>0.294</td>
<td>0.417</td>
</tr>
<tr>
<td>Danish and English</td>
<td>0.192</td>
<td>0.185</td>
<td>0.089</td>
<td>0.097</td>
</tr>
<tr>
<td>Quarterly reports</td>
<td>0.328</td>
<td>0.298</td>
<td>0.182</td>
<td>0.223</td>
</tr>
<tr>
<td>OVER-ALL</td>
<td>0.261</td>
<td>0.213</td>
<td>0.343</td>
<td>0.522</td>
</tr>
</tbody>
</table>

Table 8 depicts the cluster statistics based on the grouping of three clusters. Notice that the within standard deviation is smaller (or equal to in a few cases) to the original standard deviations. The aim is to reduce the variance or standard deviation and the ability for each variable to do so is captured in the R-square value. Notice that in the two cases where the standard deviation is not reduced i.e. Proxies to individual items and Management present at the AGM, the R-square value is nearly zero. The opposite is the case for the variables: Stakeholder Policy and CSR where the R-square value is much higher since the cluster variation is smaller than the original variation.

Table 8 also shows the $R^2$ values for predicting the variable from the cluster. The ratio of between-cluster variance to within-cluster variance ($R^2$ to 1 - $R^2$) also appears in the last column. The R square is for predicting the variable for the cluster where the observations: Stakeholder Policy, CSR and Capital/share Structure have the highest values. The pseudo F-statistics is equal to 39.99 an approximate expected overall $R^2$. The higher $R$ square, the higher the variable contributes to the cluster formation. The last column shows the statistic ($RSQ/(1-RSQ)$). A high ratio means that the variable is important in differentiating between the clusters.

The key lesson is that the grouping and categorization in the Danish Corporate governance Codes is not at all reflected in the statistical cluster analysis. This means that future revisions of the code should consider the categorization and grouping in the first three sections using the above results.

The articles findings are related to the existing literature. Talaulicar and Werder (2008) also use cluster analysis even though their scope is slightly different. They find eight discrete groups, whereas three groups are identified in this article. The reason is that their sample covers all German corporate governance recommendations (although they do not use the quantification process as in this article). However, the article’s findings are in line with Tsipouri and Xanthakis (2004) who find that the role of stakeholders as well as CSR scores low.

6. DISCUSSION AND CONCLUSION

Transparency is a crucial element in corporate governance if listed firms want to attract capital from external investors. However, transparency cannot only be seen from the perspective of the shareholders. It must be considered from a broader perspective in which the board of directors identifies the firm’s key stakeholders. This is also the main point which is emphasized in the Danish Code.

This article introduces a methodology to assess the level of corporate governance transparency in relation to the recommendations regarding the firm’s stakeholders. This approach ensures that the classification of the individual recommendations is not made ad hoc in an unsystematic manner, which may serve as inspiration for corporate governance codes in other countries. The analysis reveals that the compliance level concerning the codes recommendations regarding firm’s stakeholders is quite high. It is interesting to note that even though the comply or explain principle assumes that a meaningful explanation is equally good as compliance, the analysis
documents that the vast majority of the firms simply complies with the recommendation i.e. they do very often explain why a firm has deviated from “best practice”.

The only exception is the recommendation that a firm must explain not only its capital structure, but also its share structure e.g. if a firm has an ownership/voting ceiling, shares with dual class voting rights etc. see Rose (2002) for a description of Danish takeover defenses.

This article combines the insight from institutional knowledge, in this case about Denmark with a sound statistical analysis, which is quite rare in the literature. This enables one to get a better understanding of the underlying structure of the firms reported transparency level as well as how different recommendations may be classified into distinct sections. This approach may guide code drafters in a systematic way thereby improving the quality of firm’s transparency communication.

This article demonstrates that the current classification of the Danish stakeholder recommendations needs to be revisited. This article has demonstrated a way in which this can be done in the future. This implies that one needs to build on a multidisciplinary approach that combines institutional/legal insight with multivariate statistics. The latter discipline involves a whole range of different methods, but this article has shown that; principal, factor as well as cluster analysis may be used as building blocks for such an analysis.

Transparency is a necessary precondition for creating trust among outside investors and top management, as the presence of asymmetric information may create agency costs. When investors get a clearer picture of firms corporate governance structure, in particular how a firm deals with its key stakeholders, they are more inclined to believe that management serves the interests of the company. However, too many specific recommendations may create a false sense of trust, as there is a risk that the board of directors may view the process as a “tick the box” exercise. The consequence is that stakeholder transparency is not taken seriously enough but instead appears as “empty words”. As a result, outside investors need to have a clear picture of how a firm complies with the specific recommendations as well as how the recommendations are implemented in practice. If corporate governance is to be applied in a sound manner creating added value for all parties, it is crucial that investors feel that the recommendations are classified in a meaningful way. This article has presented a systemic methodology for this task which can be generalized to other countries.

The future research implications of the articles findings as well as methodology are twofold. First, it seems likely that the outlined methodology can be successfully used in order to quantify the degree of corporate governance compliance. This entails that we will get a more reliable picture of the compliance level and that this knowledge can be compared across countries. Secondly, in order to better understand the mechanisms and nature of transparency, this article has shown that cluster analysis may a fruitful methodology, which may be used more frequently than standard regression models. One the other hand, one should also acknowledge that there are some research limitations. It may be difficult to compare across countries with different jurisdictions and institutions. To illustrate, the shareholder value doctrine is well recognized in the US, whereas in continental Europe, there is a broader acceptance that listed firms should also take into account the interests of other stakeholders than the owners.

The findings of the article also have managerial implications. The knowledge of what is considered best practice in relation to transparency and stakeholder communication is vital when a firm wants to enter into a dialogue with all its stakeholders. To illustrate, 15 % of the firms in the article’s sample explain poorly their stakeholder policy. As a consequence, it will become more difficult to communicate and create relations with stakeholders due to the absence of a clear and trustworthy stakeholder communication. This is especially the case if a firm explains poorly in relation to its CSR policy.

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Interrelationships among Facets of Self, Motivation, and Conspicuous and Sustainable Consumption Behaviour

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Abstract

The current study focuses on a process the current researchers label intra-negotiation—which deals with resolution of an individual’s potential conflict across facets of oneself—and its influence on two distinctly different kinds of consumption (one favouring consumption, the other reducing the import of it). Specifically, we explore the discrepancy between actual-, ideal-, and ought-self and investigate the effect of these gaps on consumption behaviour. Moreover, attention is given to the association between three dominant human motives and consumption behaviour. The findings reveal that (1) ideal-actual self-discrepancy is inversely associated with achievement motivation, and (2) affiliation motivation is negatively related to conspicuous consumption. Affiliation motivation is ascertained to be positively related to sustainable consumption, whereas power motivation is discerned to be positively associated with conspicuous consumption. Neither conspicuous nor sustainable consumption is associated with the ideal-actual self or ought-actual self discrepancy. Possible rationales for the findings of the study, as well as study implications, are proffered.

Keywords: facets of self, self discrepancy, intra-negotiation of self discrepancy, consumption behaviour, human motives
1 INTRODUCTION

Consumer culture theory has observed a relationship between the self and consumption behaviour (Belk, 1988; Sirgy, 1982). In fact, regardless of one’s ethnicities, culture, principles, self-views, or income, people are motivated to express their “self” through their consumption. Although researchers have viewed the “self” from various facets, (Ahuvia, 2005; Belk, 1988; Damasio, 2003; Fournier, 1998; Gallagher, 2000; James, 1890; Lambie & Marcel, 2002; Legrand & Ruby, 2009), in the extended view of the self, individuals’ possessions are contributors to and reflections of their identities (Belk, 1988; James, 1890).

Self-discrepancy theory posits that there are three domains of the self: ideal, ought, and actual (Higgins, 1987). A dominant view of the self is the inevitable discrepancy across those three alternative selves (Higgins, 1987). Ideally, individuals likely prefer psychologically integration of the self—in other words, consistency across the self’s three facets (Deci & Ryan, 2000; Ryan & Deci, 2000). If not integrated, self-discrepancy can engender discomfort in individuals, which might motivate them to undertake efforts (e.g., make purchases) to expunge the inimical feelings (Higgins, 1987, 1989). Indeed, through consumption of possessions one strives to confirm, complete, verify, enhance, and attain his/her actual, ideal, and ought self—thus fostering integration across the three (Belk, 1984; Brown, Collins, & Schmidt, 1988; Swann Jr, Stein-Seroussi, & Giesler, 1992).

This investigation examines one other psychological state—motivation. Achievement, affiliation, and power are key learned psychological motives (Deci & Ryan, 2000; Murray, 1938) that can influence an individual’s behaviour (e.g., consumption demeanour). In the Murray (1938) tradition, the study of motivation seeks to explain, understand, and predict the reasons people engage or discontinue any set of behaviours to satisfy the foregoing three needs. When not satisfied, people search for other forms of compensation, such as wealth and possessions. Whether motivated by hedonic, utilitarian, experiential, or functional reasons, consumers engage in various consumption behaviours. Some make consumption decisions to identify with selected groups (e.g., affiliation) (Mead, Baumeister, Stillman, Rawn, & Vohs, 2011); others make purchases to display status and prestige (e.g., achievement and power) (O’Cass & McEwen, 2004; Rucker & Galinsky, 2009).

Despite the importance of and inherent self-discrepancy in each person, the issue has received minimal empirical attention in marketing. Extant work has been in the context of cosmetic surgery (Pentina, Taylor, & Voelker, 2009) and compulsive buying (Dittmar, 2005)—both in situations reflective of a culture of consumption. Indeed, research focusing on the self in marketing essentially has examined issues related to self-congruity (Sirgy, Lee, Johar, & Tidwell, 2008), self-regulation (Chan & Wan, 2012), and self-concept (Sirgy, 1982). The current study introduces a process the current researchers label intra-negotiation (which deals with resolution of an individual’s potential conflicts across three facets of oneself) and its impact on consumption behaviour. In addition, the big three motives have been found to be the influencer behind one’s language usage (Pennebaker, Mehl & Niederhoffer, 2003) to subjective well-being (Kehr, 2004). Yet, research exploring the relationship between consumption behaviours and the big three motives has been sparse.

We propose that intra-negotiation is employed to resolve conflicts between the foregoing three perceptions of the self—(1) actual- and ideal-self and (2) actual- and ought-self. The intra-negotiation process is contextually dependent, internally focused, conscious or automatic, and effortless or purposeful (Swann, 2005; Swann, 1987). During intra-negotiation, individuals use various strategies to reconcile conflicts between the actual- and ideal- or the actual- and ought-self. Specifically, the actual-self negotiates with the ideal- or ought-self to derive a coherent self, or the ideal- or ought-self negotiates with the actual-self.

The current investigation seeks to advance the literature on the relationship between the self and consumption by identifying the underlying negotiation process of the self that promotes consumers’ behaviours. The purpose of the study was to investigate the role of individuals’ self-discrepancies on two antipodal kinds of consumption—conspicuous versus sustainable consumption (Horney, 1964; Munson, 1973). Conspicuous consumption could be regarded as profligate, social status buying; sustainable consumption, buying that is salutary for overall society and oneself. Given that the ideal-self embodies extrinsic values and the ought-self intrinsic values (Higgins, 1987) and the nature of the preceding three motives, these two kinds of buyer behaviour seemed especially germane for the present study.

The main contributions of this study are to (1) introduce the intra-negotiation process of self-discrepancy, (2) explain how the role of self-discrepancy can conduce to two alternative consumption behaviours, and (3) expatiate on the underlying role of human motives on consumers’ behaviour.

2 BACKGROUND LITERATURE

As noted earlier, there are three domains of the self: ideal, ought, and actual (Higgins, 1987). The ideal-self is the representation of wishes, hopes, and aspirations that an individual and/or significant others would like him/her to achieve or realize (e.g., be a movie star, high-paid executive, beauty pageant contestant). Essentially, it represents a desired self. The ought-self is the representation of duties, responsibilities, and obligations that an individual and/or significant others feel he/she should embrace (e.g., caring friend, student, loving child). In a sense, it is redolent of a normative self. The actual-self is the representation of one’s current state (as perceived
by the individual and/or others). Thus, it is suggestive of a descriptive (i.e., extant) self. The ideal-self embodies extrinsic values; the ought-self, intrinsic values (Higgins, 1987).

The concept of the self is bounded by contextual influences. One can exert simultaneously or discretely actual self-image and actual social self-image and ideal self-image and ideal social self-image (Sirgy, 1982). These self-images can be congruent or contradict each other; if contradictory, a self-discrepancy arises. As Higgins (1989, p. 97) avers: “[A] self-discrepancy is a cognitive structure interrelating distinct self-beliefs.” In addition to the three types of self domains (actual, ought, ideal), the self also adopts two standpoints or perspectives (Higgins, 1989, p. 321): “[one’s] own personal standpoint and the standpoint of some significant other” (someone important to the individual). Self-discrepancy arises when the two stances (i.e., actual- versus ideal-self or actual- versus ought-self) are discordant, regardless of the standpoints (Higgins, 1989). Such contrariety necessitates resolution of it to foster one’s well-being.

2.1 Strategies of the Self

In self-awareness theory, Duval and Wicklund (1972) posit that, when attention is directed toward the self, an evaluation of the actual-self is compared with the ideal- or ought-self. Values and interests of the three selves sometimes are in harmony and interdependent; at other times, contradicting and independent of each other. The resulting valences of the evaluations can be either positive or negative (Higgins, 2000; Higgins, Roney, Crowe, & Hymes, 1994). However, the comparison typically yields affect that favours the ideal or ought self. The greater the difference between the actual- and ideal- or actual- and ought-self, the larger the discrepancy between the two facets and increased possibility of self conflicts and feelings of discomfort (Higgins, 1987). A negative affect favouring the ideal- or ought-self (over the actual-self) motivates behaviours to narrow the discrepancy, either through changing perceptions of the actual-self to closely match the perceptions of the ideal- or ought-self or turning away from attention to the self (Hoyle, 2006).

Germane literature infers that individuals use several strategies to manage the self to maintain a predictive and controllable self: bringing other people to view one’s un/desired self, or being relatively more internal focused, deliberate, intentional, and intra-psychic (Higgins et al., 1994; Swann, 2005; Swann, 1987). In a self-verification strategy, individuals choose to be with objects (e.g., possessions, dinner at a haute cuisine restaurant) and people who support their self-concept no matter how harsh their revealed self-concepts might be for them (Gómez, Seyle, Huici, & Swann, 2009). In a self-enhancement strategy individuals choose to associate with positive identities and outcomes (Brown et al., 1988).

In a self-completion strategy, people acquire and display material possessions to compensate for certain inadequacies of their self (Wicklund & Gollwitzer, 1982). As such, individuals rely on consumption and possessions to reconstruct their self-identity and social identity (Kleine Ii & Kleine, 2000). Consumption (or possibly even non-consumption), then, is used to narrow the gap between the ideal- or ought-self and actual-self (Dittmar, Beattie, & Friese, 1996; Eisend & Möller, 2007). The magnitude of self-discrepancy affects symbolic, functional, and emotional values of products and impulse buying frequency (Dittmar et al., 1996). In addition, discrepancy between the actual- and ought-self motivates consumers to rely on meanings inherent in products to construct their social roles, especially novel ones (Solomon, 1983). Consumption (or possibly even non-consumption) can be used to create, preserve, and cultivate a stable and harmonious self-concept (Karanika & Hogg, 2010; Schouten, 1991).

2.2 Intra-Negotiation of Self-Discrepancy

The discrepancy between the actual- and ideal- or actual- and ought-self arises owing to individuals’ continuously comparing themselves with others so as to judge how well they are doing (Festinger, 1954). In this process, well-being, values, and interests of others are reflected in their ideal- or ought-self. In other words, from a consumption perspective, self-perception of the ideal- or ought-self is anchored in what others possess (Kleine Ii & Kleine, 2000).

Once the foregoing self-evaluation process has occurred (Collins, 1996), individuals engage in various methods—such as self-verification, self-enhancement, self-completion, identity negotiations, consumption, and use of possessions—to reconcile the discrepancy (Brown, 1986; Swann, 1987; Swann & Read, 1981). Of these, identity negotiation is utilized to resolve conflicts between others’ perceptions of an individual and that person’s self-view (Swann, 1987).

Regardless of the view of the self, contemporary consumers possess fragmented and multiple senses of self (Firat & Venkatesh, 1995). In these fragmented and multiple senses, Ahuvia (2005, p. 181) argues that not many consumers abandon their desired self for a coherent identity. Rather, “throughout their lives, people strive to resolve identity conflicts, although the on-going nature of life renders each resolution inherently tentative and imperfect” (italics added). In other words, self-discrepancy, identity conflict, and identity negotiation are omnipresent (Ahuvia, 2005; Duval & Wicklund, 1972).

Building on identity negotiation theory, we propose that intra-negotiation is employed to resolve conflicts between multiple perceptions of the self—(1) actual- and ideal-self and (2) actual- and ought-self. During intra-
negotiation, individuals essay to reconcile conflicts between the actual- and ideal- or the actual- and ought-self. Specifically, the actual-self *negotiates* with the ideal- or ought-self to derive a coherent self, or the ideal- or ought-self negotiates with the actual-self.

Ahuvia (2005) proposes three distinct strategies for creating a coherent self-narrative: demarcating, compromising, and synthesizing. *Demarcating* strategy strongly endorses the ideal- or ought-self and rejects the actual-self. The outcome of this negotiation yields in favour of the ideal- or ought-self. As a result, individuals behave in such a way that solidifies and enhances the ideal- or ought-self. *Compromising* strategy attempts to resolve conflicts by being in between these two identities. The outcome of this negotiation yields behaviours that satisfy both actual-self and ideal- or ought-self. A *synthesizing* strategy combines the favourable elements of both identities and establishes a new self that satisfies both identities (Ahuvia, 2005). A review of the literature suggests that individuals use three strategies to resolve conflicts between the self. Similarly, we propose that individuals specifically negotiate between the actual-, ideal-, and ought-selves using demarcating, compromising, and synthesizing strategies.

Karanika and Hogg (2010) find that *consumption* assumes a mediating role in the identity conflict resolution process. Interestingly, they discern that individuals’ consumption strategies are mostly consistent with identity negotiation strategies proposed by Ahuvia (2005). So, as individuals encounter identity conflict, they use intra-negotiation to derive a coherent self. The overarching theme of the foregoing strategies is the selection of a *dominant* identity versus the other two facets of the self, or the compromising or rejection of both identities. The outcomes of intra-negotiation are manifested in the types of consumption thereafter. Taken together, depending on the strategies used and the resulting outcomes during the intra-negotiation process, individuals are motivated to consume products that are *consistent* with the values and interests of the *resulting self* (and thus attenuating the self conflicts).

### 2.3 Conspicuous versus Sustainable Consumption vis-à-vis the Self

The purpose of marketing traditionally has focused on satisfying consumer needs; after all, economic growth builds on unsatisfied needs (Hamilton, 2004). In a culture of consumption—“I shop, therefore I am” (Holbrook, 2001)—inherent and inevitable *self-discrepancy* motivates individuals to shop in order to “extend” the self (Belk, 1988). Marketing scholars, however, have issued a call for a transformation of marketing thought and practice that will contribute to the commonweal (Brown et al., 2005; Mick, 2007; Varey, 2010; Wilkie & Moore, 2006). These advocates admonish marketers for the tendency to neglect moral responsibility by encouraging consumers to “spend, spend, spend.” The foregoing disquisition infers that marketers proverbially have induced consumers to buy irrespective of whether the nature of the purchase is salutary for the consumer and society at large. As such, this is redolent of conspicuous consumption. Alternatively, some marketing scholars embrace the idea that marketers should provide offerings that are salubrious for both the consumer and society. Purchasing such products is reflective of sustainable consumption.

As noted earlier, when individuals embark on a demarcating strategy, the outcome of the intra-negotiation process favours the ideal- or ought-self and totally rejects the actual-self (Ahuvia, 2005). We postulate that individuals using a demarcating strategy engage in two kinds of antipodal consumption. More specifically, Munson (1973) and Hornery (1964) promulgate that the self has an impact on whether the individual engages in two kinds of antipodal consumption—“conspicuous” versus “sustainable”—which embody a *consumption spectrum*. Conspicuous consumption differs from sustainable consumption in terms of using scarce resources versus minimal resources.

### 2.4 Conspicuous Consumption

Conspicuous consumption is “the purchase of goods or services for the specific purpose of displaying one's wealth” (Investopia, 2015). Conspicuous, extravagant, or status consumption refers to the same phenomenon. Many scholars have explored this behaviour, starting with Veblen’s (1925) conception of the urban nouveau riche to the newly-entitled “me” generation (Twenge, 2006). Such individuals exercise “a deliberate engagement in symbolic and visible purchase, possession, and usage of products and services imbued with scarce economic and cultural capital with the motivation to communicate a distinctive self-image to others” (Roy Chaudhuri, Mazumdar, & Ghoshal, 2011).

Conspicuous consumption encompasses two dimensions: social visibility and uniqueness of products, services, and experiences (Roy Chaudhuri et al. 2011). *Social visibility* refers to a person’s proclivity to be conspicuous (observable) to others in ways that might enhance his/her status through possessions. *Uniqueness* pertains to being distinct from others by purchasing items that few people own. Conspicuous consumption consumers are willing to pay a premium price for an equivalently functional product or service in order to achieve perceived status and prestige (Bagwell & Bernheim, 1996). They use visible status symbols to categorize themselves in society and to facilitate the self’s achieving self-congruency (Belk, 1988; Chaudhuri & Majumdar, 2010).
As individuals compare themselves with others, the upward/unfavourable comparisons (i.e., comparing oneself with someone he/she perceives as truly superior to the individual, thus leading to an unfavourable perception of oneself vis-à-vis the referent other) occur faster than the downward/favourable comparisons (comparing oneself with someone he/she perceives as truly inferior to the individual, thus leading to a favourable perception of oneself vis-à-vis the referent other) (Wood, 1989). Feelings of inadequacy and inferiority motivate individuals to increase their consumption (Christen & Morgan, 2005; Drèze & Nunes, 2009). Specifically, relative to high income persons, low-income individuals spend more on conspicuous consumption in order to “keep up with the Joneses” (Christen & Morgan, 2005; Drèze & Nunes, 2009).

Interestingly, individuals with higher self-discrepancy are found to have a stronger need for products that will make them feel worse about themselves (Daza, 2011). (Essentially, these persons make purchases to close the ideal-actual discrepancy, but doing so does not make them happy.) This need is especially prevalent among individuals whose ideals are anchored in extrinsic (e.g., money, wealth, beauty), rather than in intrinsic (e.g., personal growth, inner freedom, self-actualization), values (Daza, 2011). Indeed, a relatively recent study found that people who care about social position and status are motivated to spend more on conspicuous consumption when their material possession comparisons with others do not yield unfavourable impressions (Ordabayeva & Chandon, 2011). Those authors also ascertained that material possession equality motivates individuals with extrinsic values—such as social position and status—to increase their conspicuous consumption, thus enhancing a perception that one is favourably different from the referent other.

Munson (1973) and Horney (1964) declare that conspicuous consumption products are preferred by the ideal-self. Conceivably, conspicuous consumption is the manifestation of the ideal-self, resulting from the intra-negotiation process between the actual- and the ideal-self. A preference for conspicuous consumption results in the ideal-self overcoming the actual-self.

Alternatively, Ordabayeva and Chandon (2011) find that material possession equality reduces conspicuous consumption for people who do not care about their social position. Indeed, a predilection for sustainable consumption may well lead to the ought-self supplanting the actual-self with the denouement being an aversion to conspicuous consumption kinds of products. After all, the ought-self embodies normative beliefs and intrinsic (i.e., non-material) values, thus seemingly conducing to a consumer’s decreased attention or interest in status-oriented items.

The foregoing implies that the ideal-self will be favourably disposed toward conspicuous consumption. In contrast, though, the ought-self contains some sense of intrinsic values; thus, it is likely to have the opposite impact on conspicuous consumption from the ideal-self. Based on the preceding dialectic, then, the following hypotheses are offered:

\[ H_{\text{id}}: \text{Ideal-actual self-discrepancy is positively related to conspicuous consumption.} \]
\[ H_{\text{od}}: \text{Ought-actual self-discrepancy is negatively related to conspicuous consumption.} \]

2.5 Sustainable Consumption.

Sustainable consumption has been defined as “the use of goods and services that respond to basic needs and bring a better quality of life, while minimizing the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardize the needs of future generations” (Oslo Roundtable on Sustainable Production and Consumption, 1994). A desire for a simple lifestyle or concern for societal welfare is a touchstone of sustainable consumption, which is in sharp contrast to a desire for social visibility and uniqueness (conspicuous consumption). Individuals opting for sustainable consumption, to some extent, may exhibit anti-consumption behaviours through focusing on sustainable living (Iyer & Muncy, 2009; Lee, Roux, Cherrier, & Cova, 2011).

Originally mentioned as responsible living (Fisk, 1973), sustainable living transcends anti-consumption. Specific behaviours include rejection of or reduction in consumption, as well as reusing and recycling products. Sustainable consumption closely relates to thriftiness, frugality, and environmental consciousness (Black & Cherrier, 2010; Fisk, 1973). Sustainable consumers attempt to live a so called “sustainable” life by not purchasing conspicuous products, in general (Black & Cherrier, 2010; Iyer & Muncy, 2009).

Scholars have identified two types of sustainable consumers: simplifiers and global impact consumers. Simplifiers eschew a culture of consumption and do not derive happiness through ownership of possessions (Cherrier, 2009). They believe in sustainable, simplified, and reduced consumption-based lifestyles (e.g., green living) but are not “frugal materialists” who reduce consumption in one area to increase consumption in another (Lastovicka, Bettencourt, Shaw Hughner, & Kuntze, 1999). They possess negative attitudes toward hyper-consumption and eschew hyper-consumption as a means for enhancing personal well-being.

Global impact consumers focus on benefiting humanity at large. They are concerned about environmental waste, material inequality across nations, and societal issues (Iyer & Muncy, 2009). Global impact consumers oppose a hyper-consumption culture (Albinsson, Wolf, & Kopf, 2010). They also reject conspicuous products as a means of achieving personal fulfilment and the desired self (Cherrier, 2009; Cherrier, Black, & Lee, 2011; Iyer
Moreover, they are resistant toward a culture of consumption and project consumer-resistant identities (Cherrier, 2009; Cherrier et al., 2011).

Conceivably, sustainable consumption lifestyles are a contradistinction to conspicuous consumption lifestyles. Individuals attempt to derive a desired-self through means of a consumption spectrum, with the endpoints referring to sustainable versus conspicuous behaviours (Horney, 1964; Munson, 1973). Empirical research relating to sustainable consumption is sparse. Inferring from the preceding discussion related to conspicuous consumption, though, discrepancies between the ideal-actual self and ought-actual self conceivably have contrasting relationships with sustainable consumption. With the putative negative effects of a consumption culture and a materialistic society anchored in extrinsic values of the ideal-self, sustainable consumption is likely to appeal to the ought-self. Thus, the following hypotheses are proffered:

H₁₅: Ideal-actual self-discrepancy is negatively related to sustainable consumption.
H₁₆: Ought-actual self-discrepancy is positively related to sustainable consumption.

2.6 Consumption and Motivation

The achievement motive is one’s desire to excel and outperform established sets of standards relative to oneself or others (McClelland 1985). Those possessing this motive have a motive and desire to excel. The motivation centres on competence and functions as directive influences on affect, cognition, and behaviour (Elliot, 1999). The affiliation motive refers to one’s desire to form friendships and associations with others (Murray, 1938). Its focal point is on establishing a sense of belonging. Per Maslow’s (1954) need hierarchy, it pertains to a desire to achieve “belongingness and love.” The power motive entails yearning to affect, control, and influence other people (Winter, 1973). Power-driven individuals prefer to be visible, influential, and dominant in either personal or professional positions. These individuals tend to draw attention to themselves and impress others by displaying prominent status (Ng, Winter, & Cardona, 2011) and by consuming ostentatious products (Winter, 1973).

2.7 Achievement Motivation and Consumption.

Owning products with specific brand names can be redolent of a sense of achievement for many consumers (O’cass & Frost, 2002; O’Cass & McEwen, 2004). The empirical relationship between achievement motivation and consumption has rarely been reconnoitred. However, extant studies have attempted to connect the need to achieve with conspicuous consumption. In a study of willingness to pay premium prices, consumers were observed to be more inclined to pay higher prices when experiencing feelings of envy. Van de Ven et al. (2011) reason that envy is the engine of consumers’ achievement motivation—according to Corneo and Jeanne’s (1997, 2001a, 2001b) studies. In addition, materialistic individuals tend to have achievement goals (Ku 2004). From this perspective, the putative association between the achievement motive and conspicuous consumption can be proffered:

H₅: The achievement motive is positively related to conspicuous consumption.

2.8 Affiliation Motivation and Consumption.

Possibly a high need for social affiliation heightens one’s focus on monitoring social inclusion. Research has found that social exclusions increase affiliation needs (Mead et al., 2011), augment conformance to group norms (Williams, Cheung, & Choi, 2000), and raise the focus toward impression management (Lakin, Chartrand, & Arkin, 2008). Recent work on social exclusion ascertains that individuals are motivated to spend and consume in order to gain affiliation (Mead et al., 2011). This implies that the nature of the group (i.e., its raison d’être or focus) toward which the individual aspires—à la conspicuous or sustainable products in this study—is likely to affect the person’s consumption behaviour. In fact, extant work indicates that motivation to conform to outside influence (e.g., “significant others”) affects consumers’ purchase behaviours (e.g., Tran et al., 2014). Thus, a need to join and associate with a group encourages individuals to interact with the group and conceivably engage in (conform to) consumption behaviour that is consistent with the members of the particular group. As such, the following hypotheses are offered:

H₂: Affiliation motive is positively related to conspicuous consumption.
H₃: Affiliation motive is positively related to sustainable consumption.

2.9 Power Motivation and Consumption.

Power-motivated persons might have the desire to focus on their state of power and thus be motivated to acquire more power. In addition, people generally prefer to have more power than less (Handgraaf, Van Dijk, Vermunt, Wilke, & De Dreu, 2008). The foregoing thus suggests that high power-motivated individuals seek to increase power (Ronay & von Hippel, 2010). Findings from germane work indicate that powerless individuals
are motivated to consume luxurious and status goods to restore power (Rucker & Galinsky, 2008). The logic is that status is a form of power (Chaudhuri & Majumdar, 2006; O’Cass & McEwen, 2004). Conceivably, power-motivated individuals are inclined to purchase conspicuous products to manifest such power. Thus, the following hypothesis is proposed:

H₀: Power motivation is positively related to conspicuous consumption.

3 METHODOLOGY

3.1 Sample and Procedure

The survey was administered online to college students for a duration of 20 minutes. Respondents were informed that their participation or lack thereof would not affect their class standing. Extra class credit was given for completing the survey, but there was no penalty for not completing it. Responses remained completely anonymous. A total of 538 surveys were returned. Thirteen surveys were deleted, due to abundant missing data, thus yielding the final data set of 525 respondents. Respondent demographics were as follows: average age, 22.73 years; gender, 46.7% male; ethnicity, 56.8% Caucasian; parents’ income, 31.2% beyond $100,000; respondents’ income, 41.2% under $9,999; and marital status, 92.3% single or never married. Nonresponse bias was assessed by splitting the sample into early and late respondents and measuring differences between those two groups vis-à-vis the demographics data (Armstrong & Overton, 1977). Results yielded no statistically significant (p > .05) differences.

3.2 Measurement Validation

All measures were adapted from extant scales. Conspicuous (Roy Chaudhuri et al., 2011) and sustainable (Iyer & Muncy, 2009) consumption constructs were anchored on a 7-point Likert scale, from 1 = strongly disagree to 7 = strongly agree. As noted earlier, conspicuous consumption consists of two components, social visibility and uniqueness. To be compatible with extant work, both components were assessed. Also, as mentioned previously, there are two kinds of sustainable consumers, simplifiers and global impact. Again, to be consistent with prior work, both consumer types were assessed. Accordingly, when testing hypotheses pertaining to either kind of consumption, tests were conducted on the germane two underlying constituents. Also, achievement, affiliation, and power motivation were adapted from the work of Jackson (1984); the aforementioned Likert scale was utilized for these items as well.

The conventional scale measuring self-discrepancy provides a 28-item adjective checklist (Gough and Heilbrun, 1983); an alternative is a user-generated technique, which was employed in this study. The latter approach has been shown to be consistent with theory, be less demanding for respondents, and have fewer measurement errors (Francis, Boldero, & Sambell, 2006). Because the self-discrepancy concept is the perception of the differences between the actual and desired state, individuals’ ought- and ideal- self-discrepancy not only differ in the current and future states, but the dimensions also vary. Traits, behaviours, attitudes, feelings, and states of beings are all valid dimensions of self-concept. Thus, a nonidiographic self-concept measure is insufficient to capture individuals’ self-discrepancy. Moretti and Higgins (1990) emphasize the import of measuring self-discrepancy using idiographic self-nominated attributes as opposed to standard self-ratings (per the checklist of Gough and Heilbrun [1983]).

To assess self-discrepancy, a measure was partially adapted from Francis et al. (2006). (Because the measure was adapted, it was not pre-tested.) First, participants were asked to generate four ideal- and ought-self attributes. Second, they were asked to list four corresponding antonyms of the attributes that they had generated, and then place them at the opposite end of a 7-point Likert scale. Third, they were asked to select where they saw themselves currently in relation to these attributes. The 7-point Likert scale was anchored from 1 = ideal- and ought-self to 7 = antonym of ideal- and ought-self. Examples of the attributes/antonyms used included healthy/unhealthy, hardworking/lazy, successful/unsuccesful, happy/depressed, and provider/taker, among others.

Items were first examined using principal components analysis and Varimax rotation to identify and remove substantive cross-loading items. Second, measurement validities were assessed by calculating Cronbach alphas for each construct. All alphas were at acceptable levels (α > .7) (Nunnally, 1978). Third, the resulting sets of items were analyzed via confirmatory factor analysis using LISREL 8.8 to verify unidimensionality. The goodness of fit indices indicated good fit: Chisquare = 1138.38 df = 524; IFI = 0.96, NFI = 0.93, AGFI = 0.87, CFI = 0.96, SRMR = 0.052, RMSEA = 0.047 (Hu and Bentler 1999). The chi-square statistic was significant (p<.05). However, the chi square statistic often rejects valid models in research with large samples (n = 525 in this study) (Bagozzi and Yi 1988). Study measurement items—and concomitant statistics—are shown in Tables 1, 2, 3, 4, and 5.
### Table 1: Factor structure of achievement, affiliation, and power motives

<table>
<thead>
<tr>
<th>Statement</th>
<th>Achievement</th>
<th>Power</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am attracted by tasks, in which I can test my abilities.</td>
<td>.887</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am interested in situations allowing me to test my abilities.</td>
<td>.849</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I enjoy working on difficult tasks.</td>
<td>.778</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like situations in which I can find out how capable I am.</td>
<td>.728</td>
<td>.453</td>
<td></td>
</tr>
<tr>
<td>I think I would enjoy having authority over other people.</td>
<td></td>
<td></td>
<td>.888</td>
</tr>
<tr>
<td>I find satisfaction in having influence over others.</td>
<td></td>
<td></td>
<td>.809</td>
</tr>
<tr>
<td>I strive to gain control over the events around me at school or work.</td>
<td></td>
<td></td>
<td>.778</td>
</tr>
<tr>
<td>If given the chance, I would make a good leader of people.</td>
<td></td>
<td></td>
<td>.652</td>
</tr>
<tr>
<td>There are some people that I feel very close to.</td>
<td></td>
<td></td>
<td>.800</td>
</tr>
<tr>
<td>Having closed personal relationship is very important to me.</td>
<td></td>
<td></td>
<td>.731</td>
</tr>
<tr>
<td>Whenever I believe that I have hurt someone’s feelings, I feel guilty.</td>
<td></td>
<td></td>
<td>.722</td>
</tr>
<tr>
<td><strong>Percentage of variance</strong></td>
<td>26.95</td>
<td>24.50</td>
<td>19.38</td>
</tr>
</tbody>
</table>

### Table 2: Factor structure of conspicuous consumption: uniqueness and social visibility

<table>
<thead>
<tr>
<th>Statement</th>
<th>Uniqueness</th>
<th>Social visibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>By choosing a product having an exotic look and design, I show my friends that I am different.</td>
<td>.863</td>
<td></td>
</tr>
<tr>
<td>I choose products or brands to create my own style that everybody admires.</td>
<td>.844</td>
<td></td>
</tr>
<tr>
<td>Others wish they could match my eyes for beauty and taste.</td>
<td>.783</td>
<td></td>
</tr>
<tr>
<td>I would buy an interesting and uncommon version of a product otherwise available with a plain design, to show others that I have an original taste.</td>
<td>.753</td>
<td></td>
</tr>
<tr>
<td>I buy some products because I want to show others that I am wealthy.</td>
<td></td>
<td>.825</td>
</tr>
<tr>
<td>It says something to people around me when I buy a high priced brand.</td>
<td></td>
<td>.805</td>
</tr>
<tr>
<td>I would be a member in a businessmen’s posh club.</td>
<td></td>
<td>.802</td>
</tr>
<tr>
<td>Given a chance, I would hang a Hussain painting in drawing my room.</td>
<td></td>
<td>.639</td>
</tr>
<tr>
<td><strong>Percentage of variance</strong></td>
<td>36.73</td>
<td>34.24</td>
</tr>
</tbody>
</table>

### Table 3: Factor structure of sustainable consumption: global impact consumers and simplifiers

<table>
<thead>
<tr>
<th>Statement</th>
<th>Global impact consumers</th>
<th>Simplifiers</th>
</tr>
</thead>
<tbody>
<tr>
<td>We must do our part to conserve world’s resources.</td>
<td>.850</td>
<td>.770</td>
</tr>
<tr>
<td>If the world continues to use up its resources, it will not survive.</td>
<td>.784</td>
<td></td>
</tr>
<tr>
<td>If we all consume less, the world would be a better place.</td>
<td>.782</td>
<td></td>
</tr>
<tr>
<td>Most people buy way too many things that they really don’t need.</td>
<td>.690</td>
<td></td>
</tr>
<tr>
<td>Brand name is not important to me.</td>
<td></td>
<td>.770</td>
</tr>
<tr>
<td>“Waste no, want not” is a philosophy I follow.</td>
<td></td>
<td>.739</td>
</tr>
<tr>
<td>Given a choice, I would like to buy ‘do-it-yourself’ products.</td>
<td></td>
<td>.720</td>
</tr>
<tr>
<td>Living a simple life makes me happier.</td>
<td></td>
<td>.563</td>
</tr>
<tr>
<td><strong>Percentage of variance</strong></td>
<td>32.46</td>
<td>26.12</td>
</tr>
</tbody>
</table>

23
Table 4: Structural Equation Model Results

<table>
<thead>
<tr>
<th>Construct and Scale Items</th>
<th>Std. est.</th>
<th>t-stats</th>
<th>CR</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Achievement Motivation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am attracted by tasks, in which I can test my abilities.</td>
<td>.88</td>
<td>27.33</td>
<td>.904</td>
<td>.707</td>
</tr>
<tr>
<td>I am appealed by situations allowing me to test my abilities.</td>
<td>1.0</td>
<td>28.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I enjoy working on difficult tasks.</td>
<td>1.0</td>
<td>na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like situations in which I can find out how capable I am.</td>
<td>.90</td>
<td>20.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Affiliation Motivation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There are some people that I feel very close to.</td>
<td>.77</td>
<td>10.59</td>
<td>.734</td>
<td>.485</td>
</tr>
<tr>
<td>Having closed personal relationship is very important to me.</td>
<td>1.0</td>
<td>na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whenever I believe that I have hurt someone’s feelings, I feel guilty.</td>
<td>.99</td>
<td>15.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power Motivation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I think I would enjoy having authority over other people.</td>
<td>.73</td>
<td>15.34</td>
<td>.839</td>
<td>.568</td>
</tr>
<tr>
<td>I find satisfaction in having influence over others.</td>
<td>.93</td>
<td>19.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I strive to gain control over the events around me at school or work.</td>
<td>1.0</td>
<td>na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If given the chance, I would make a good leader of people.</td>
<td>.90</td>
<td>16.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ideal vs. Actual Self</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Please indicate where you see yourself actually are in relation to your ideal 1</td>
<td>1.0</td>
<td>na</td>
<td>.758</td>
<td>.441</td>
</tr>
<tr>
<td>Please indicate where you see yourself actually are in relation to your ideal 2</td>
<td>.98</td>
<td>12.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Please indicate where you see yourself actually are in relation to your ideal 3</td>
<td>.99</td>
<td>12.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Please indicate where you see yourself actually are in relation to your ideal 4</td>
<td>.92</td>
<td>12.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ought vs. Actual Self</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Please indicate where you see yourself actually are in relation to your ought 1</td>
<td>.90</td>
<td>14.13</td>
<td>.807</td>
<td>.512</td>
</tr>
<tr>
<td>Please indicate where you see yourself actually are in relation to your ought 2</td>
<td>1.0</td>
<td>na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Please indicate where you see yourself actually are in relation to your ought 3</td>
<td>.98</td>
<td>14.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Please indicate where you see yourself actually are in relation to your ought 4</td>
<td>.95</td>
<td>14.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Conspicuous Consumption: Social Visibility</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I buy some products because I want to show others that I am wealthy.</td>
<td>1.0</td>
<td>na</td>
<td>.837</td>
<td>.566</td>
</tr>
<tr>
<td>It says something to people around me when I buy a high priced brand.</td>
<td>.96</td>
<td>20.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would be a member in a businessmen’s posh club.</td>
<td>.94</td>
<td>19.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Given a chance, I would hang a Hussain painting in drawing my room.</td>
<td>.68</td>
<td>13.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Conspicuous Consumption: Uniqueness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>By choosing a product having an exotic look and design, I show my friends that I am different.</td>
<td>.88</td>
<td>21.34</td>
<td>.888</td>
<td>.666</td>
</tr>
<tr>
<td>I choose products or brands to create my own style that everybody admires.</td>
<td>.90</td>
<td>21.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others wish they could match my eyes for beauty and taste.</td>
<td>.95</td>
<td>23.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would buy an interesting and uncommon version of a product otherwise available with a plain design, to show others that I have an original taste.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sustainable Consumption: Global Impact Consumers</strong></td>
<td>.94</td>
<td>14.72</td>
<td>.808</td>
<td>.519</td>
</tr>
<tr>
<td>We must do our part to conserve world’s resources.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If the world continues to use up its resources, it will not survive.</td>
<td>1.0</td>
<td>na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If we all consume less, the world would be a better place.</td>
<td>.93</td>
<td>15.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most people buy way too many things that they really don’t need.</td>
<td>.84</td>
<td>14.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sustainable Consumption: Simplifiers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brand name is not important to me.</td>
<td>.85</td>
<td>9.69</td>
<td>.694</td>
<td>.363</td>
</tr>
<tr>
<td>“Waste no, want not” is a philosophy I follow.</td>
<td>1.0</td>
<td>na</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Given a choice, I would like to buy “do-it-yourself” products.</td>
<td>.85</td>
<td>9.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living a simple life makes me happier.</td>
<td>.92</td>
<td>9.72</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. “na” = “not applicable.”

Table 5: Means, Standard Deviations, Alphas, Correlations, and Shared Variances

<table>
<thead>
<tr>
<th>Construct and Scale Items</th>
<th>Means</th>
<th>s.d.</th>
<th>α</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achievemen Motivation</td>
<td>5.53</td>
<td>1.09</td>
<td>.89</td>
<td>1</td>
<td>.30</td>
<td>.22</td>
<td>.01</td>
<td>.00</td>
<td>.00</td>
<td>.02</td>
<td>.09</td>
<td>.05</td>
</tr>
<tr>
<td>Affiliation Motivation</td>
<td>5.79</td>
<td>1.01</td>
<td>.70</td>
<td>.55</td>
<td>1</td>
<td>.11</td>
<td>.00</td>
<td>.00</td>
<td>.01</td>
<td>.13</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Power Motivation</td>
<td>5.09</td>
<td>1.13</td>
<td>.83</td>
<td>.46</td>
<td>.34</td>
<td>1</td>
<td>.00</td>
<td>.00</td>
<td>.03</td>
<td>.10</td>
<td>.03</td>
<td>.00</td>
</tr>
<tr>
<td>Ideal-Actual Discrepancy</td>
<td>3.40</td>
<td>1.16</td>
<td>.76</td>
<td>-.13</td>
<td>-.03</td>
<td>-.09</td>
<td>1</td>
<td>.29</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Ought-Actual Discrepancy</td>
<td>3.53</td>
<td>1.46</td>
<td>.81</td>
<td>.00</td>
<td>.05</td>
<td>-.04</td>
<td>.54</td>
<td>1</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Social Visibility</td>
<td>3.22</td>
<td>1.51</td>
<td>.83</td>
<td>-.07</td>
<td>-.11</td>
<td>.19</td>
<td>-.02</td>
<td>-.04</td>
<td>1</td>
<td>.40</td>
<td>.01</td>
<td>.02</td>
</tr>
<tr>
<td>Uniqueness</td>
<td>3.86</td>
<td>1.51</td>
<td>.88</td>
<td>.14</td>
<td>.11</td>
<td>.32</td>
<td>-.03</td>
<td>-.04</td>
<td>.64</td>
<td>1</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Global Impact</td>
<td>5.37</td>
<td>1.08</td>
<td>.80</td>
<td>.30</td>
<td>.36</td>
<td>.18</td>
<td>-.04</td>
<td>.03</td>
<td>-.14</td>
<td>.06</td>
<td>1</td>
<td>.15</td>
</tr>
<tr>
<td>Simplifiers</td>
<td>4.46</td>
<td>1.15</td>
<td>.69</td>
<td>.22</td>
<td>.12</td>
<td>.09</td>
<td>.00</td>
<td>.02</td>
<td>-.15</td>
<td>.04</td>
<td>.4</td>
<td>1</td>
</tr>
</tbody>
</table>

Note. Correlations are reported in the lower half of the matrix.
Note. Shared variances are reported in the upper half of the matrix.

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Fourth, convergent validity was assessed by examining the completely standardized factor loadings. All loadings were statistically significant (t-values ranged from 9.67 to 28.49) and exceeded the recommended .50 level (Hair et al. 2006). Convergent validity was also assessed by calculating composite reliabilities, as recommended by Fornell and Larcker (1981). All constructs, ranging from .75 to 90, exceeded the recommended level (>7). Another assessment of convergent validity was examined using the average variance extracted (AVE). With the exceptions of ideal-actual, affiliation, and sustainability consumption, all AVEs exceeded the recommended level (>5). However, the Cronbach’s alphas of ideal-actual, affiliation, and sustainability consumption were at acceptable levels for exploratory research. Fifth, discriminant validities were assessed by comparing the square of the correlation between each construct with the corresponding average variance extracted. In each case, the square of the correlation between each pair of constructs was significantly lower than the AVEs. These results demonstrated good discriminant validity (Fornell & Larcker, 1981).

3.3 Hypothesized Structural Model Results
The structural model also provided good fit to the study: The goodness of fit indices indicated good fit: Chisquare = 1433.07 df = 538; IFI = 0.96, NFI = 0.92, AGFI = 0.86, CFI = 0.96, SRMR= 0.056 (Hu and Bentler 1999). Again, the chi-square statistic was significant (p<.05) due to large samples research (Bagozzi and Yi 1988). Shown in Table 6 are the standardized path coefficients and associated significant levels of the proposed relationships.

3.4 Results of Hypothesis Tests.
H1a,b predicted that the ideal-actual (ought-actual) discrepancy is positively (negatively) related to conspicuous consumption. H2a,b posited that the ideal-actual (ought-actual) discrepancy is negatively (positively) related to sustainable consumption. Owing to insignificant results (p > .05—Table 6), however, none of these hypotheses receives empirical support.

H3 predicted that achievement motivation would be positively associated with conspicuous consumption. Such motivation, however, evinces no significant relationship (p > .05) with either of the two components of conspicuous consumption—social visibility and uniqueness; so, the hypothesis is rejected. H4 proposed that affiliation motivation would be positively related to conspicuous consumption. Results are significant for social visibility (-.46, t = 3.4, p < .05)—but in the obverse direction—as for uniqueness (-.02, t = .19, p < .05). Thus, H4 is not supported. H5 posited that affiliation motivation would be positively related to sustainable consumption. Results are significant for one of the two types of sustainable customers: global impact consumers (.58, t = 6.01, p < .05); simplifiers (.15, t = 1.38, p > .05). Thus, H5 is partially supported. H6 promulgated that power motivation would be positively associated with conspicuous consumption. Results are significant for both social visibility and uniqueness (.54, t = 6.85, p < .05; .47, t = 6.14, p < .05); thus, H6 is supported.

Table 6: Hypothesized Model Structural Coefficients

<table>
<thead>
<tr>
<th>Path</th>
<th>Standard coefficients (t-values)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a Ideal-Actual (+) → conspicuous consumption</td>
<td>-.02 (.26) &amp; .04 (.54)</td>
</tr>
<tr>
<td>H1b Ought-Actual (-) → conspicuous consumption</td>
<td>-.02 (.39) &amp; .06 (1.04)</td>
</tr>
<tr>
<td>H2a Ideal-Actual (-) → sustainable consumption</td>
<td>-.04 (.67) &amp; .06 (.97)</td>
</tr>
<tr>
<td>H2b Ought-Actual (+) → sustainable consumption</td>
<td>.0 (.1) &amp; -.01 (.22)</td>
</tr>
<tr>
<td>H3 Achievement (+) → social visibility</td>
<td>-.15 (1.37)</td>
</tr>
<tr>
<td>H3 Achievement (+) → uniqueness</td>
<td>-.01 (.08)</td>
</tr>
<tr>
<td>H4 Affiliation (+) → social visibility</td>
<td>-.46 (.340)</td>
</tr>
<tr>
<td>H4 Affiliation (+) → uniqueness</td>
<td>-.02 (1.19)</td>
</tr>
<tr>
<td>H4 Affiliation (+) → global impact</td>
<td>.59 (.601)</td>
</tr>
<tr>
<td>H4 Affiliation (+) → simplifying</td>
<td>.15 (1.38)</td>
</tr>
<tr>
<td>H6 Power (+) → social visibility</td>
<td>.54 (.685)</td>
</tr>
<tr>
<td>H6 Power (+) → uniqueness</td>
<td>.47 (6.14)</td>
</tr>
</tbody>
</table>

*The coefficient and t-value on the left denotes the results for “social visibility”; on the right, for “uniqueness.”
*The coefficient and t-value on the left denote the results for “global impact customers”; on the right, for “simplifiers.”
*p < .05
4 DISCUSSION

A study was conducted chiefly to examine how consumption behaviour is influenced through self-discrepancies and motivation of individuals. In doing so, the concept of the intra-negotiation process was introduced. Intra-negotiation is a concerted endeavour on the part of an individual to undertake efforts to reconcile discrepancies between his/her ideal- and ought-self vis-à-vis the actual-self. This is the inaugural investigation in the marketing discipline to reconnoiter the influence of self-discrepancies on both conspicuous and sustainable consumption. Previous empiricism has minimally investigated the former, and no extant published work was found that examined the latter. Findings were not supportive of most hypotheses, yet analyses did proffer some expected and unexpected, but intriguing, outcomes.

4.1 Interpretation of the Findings.

Surprisingly, neither conspicuous nor sustainable consumption was associated with the ideal-actual self or ought-actual self discrepancy. The ideal-actual self discrepancy was proposed to be positively related to conspicuous consumption and negatively related to sustainable consumption. The ought-actual self discrepancy was presupposed to be negative associated with conspicuous consumption and positively associated with sustainable consumption. The foregoing results imply that the extent of difference between the actual and the other two facets of self seemingly does not affect whether consumers opt for either kind of consumption behaviour. Perhaps the “genre” of consumption (conspicuous or sustainable in this case) is impervious to issues of self-discrepancy. Alternatively, peradventure the discrepancy in the selves will not induce consumers to pursue either kind of consumption behaviour in efforts to reduce the discordancy among facets of the self.

All three kinds of motivation were hypothesized to be positively related to conspicuous consumption. The supposition was that purchasing products can be reflective of one’s achievement, desire for inclusion in a group, and expression of increased power. Achievement motivation, however, was unrelated to conspicuous consumption. As noted earlier, the achievement motivation/conspicuous consumption association has yet to be explored. Nonetheless, empirical work has found a tangential relationship between the two constructs (Corneo and Jeanne 1997, 2001a, 2001b; Ku 2004; Van de Ven et al. 2011). Thus, the finding in this study is not compatible with those obtained in the foregoing investigations. Conceivably, consumers might not regard observable, status-oriented products as signs of achievement or accomplishment. Given the perceived “commodification” of many products today, consumers may consider many erstwhile high status offerings to be mainstream—thus not conferring special cachet on them vis-à-vis referent others.

Interestingly, affiliation motivation was discerned to be negatively related to conspicuous consumption. Based on prior research (e.g., Mead et al., 2011), a positive association was expected. Evidently, having an acute aspiration to “belong” does not lead an individual to purchase status-oriented items; indeed, it pushes them not to buy such offerings. Again, just as with achievement motivation, maybe the commoditization of products has led consumers to perceive that having observable, high cachet-laden products will not afford them entry into a particular group. Accordingly, this finding begs the question whether individuals truly are motivated to spend and consume in order to gain affiliation, as Mead et al. (2011) found.

Power motivation was ascertained to be positively related to conspicuous consumption. This result is consistent with germane work in the area (Chaudhuri & Majumdar, 2006; O’Cass & McEwen, 2004; Rucker & Galinsky, 2008). Ostensibly, consumers feel that possessing the “right” products will enhance their feelings of control and influence over others. This suggests that consumers who aspire to power will undertake efforts to augment their power via visible, status-oriented offerings.

Affiliation motivation was promulgated as being positively associated with sustainable consumption. Findings supported this supposition, thus comporting with tangentially-related prior research (e.g., Lakin, Chartrand, & Arkin, 2008; Williams, Cheung, & Choi, 2000). The result infers that by being desirous of having a sense of belongingness, purchasing items that are good for society in the long run and that are not redolent of excessive consumption will be salutary for such individuals. In fact, this speculation is further supported with the inverse association observed between the affiliation motive and conspicuous consumption.

4.2 Contributions to Theory

Three major contributions flow from the current investigation. First, the concept of intra-negotiation was introduced. It was presented as an alternative approach individuals use in resolving their self-disparities and thus reflects a new, alternative strategy for reconciling differences across the self. We thus advance the literature on the relationship between the self and consumption by identifying the underlying negotiation process of the self that promotes consumers’ behaviours. With its introduction, intra-negotiation may well help enhance understanding of how or why consumers utilize consumption in their efforts to resolve people’s discordant views of the self.

Second, this is only the third investigation to explore self-discrepancy in a marketing context. Owing to the dramatic influence self-discrepancy can have on individuals’ behaviour, exploring the concept in a consumption setting seemed warranted. As such, it adds to the paucity of knowledge regarding the impact of
self-discrepancy on consumer behaviour. Indeed, extant work pertaining to the self in marketing essentially has primarily examined issues related to self-congruity, self-regulation, and self-concept, not self-discrepancy.

Third, this work included two distinctly different kinds of consumption, conspicuous and sustainable. Rarely, though, has an investigation examined these contrasting kinds of consumption conterminously. The study thus adds to knowledge regarding potential influencers of these two antipodal kinds of consumption. In particular, the current research has advanced extant knowledge by exploring conspicuous and sustainable consumption vis-à-vis both self-discrepancy and human motives.

4.3 Contributions to Practice

Study findings offer prospective directions for marketers. The findings that the (1) ideal-actual self-discrepancy is inversely associated with achievement motivation and (2) affiliation motive is negatively related to conspicuous consumption, while unexpected, can plausibly be explained. One would expect that conspicuous products and services are manifestations of a person’s achievement and desire to conform to group “norms” of consumption. Perhaps, however, the “American dream” puts pressure on achievement- and affiliation-oriented individuals, thus widening their ideal-actual-self gaps. Unable to manage such social pressures effectively, they conceivably become cynical, thus resisting consumption of socially visible offerings. This explanation is supported by the recent work of Mikkonen et al. (2011). Foucault (1983) describes individuals who are against social order of contemporary and normalized subjectivity. Such persons refuse to be what they are and attempt to create a new identity via iconoclastic efforts. The implication seemingly, then, is that upscale and luxury goods marketers may not wish to be perfervid in closely tying their products to a consumer’s sense of achievement.

Also, affiliation motivation was ascertained to be positively related to sustainable consumption. Marketers selling products that are ecologically friendly may wish to promote their wares as being especially apposite for individuals who are in the vanguard of those having a concern about the environment and long-term impact on society. Using spokespersons from such entities as nongovernment organizations (e.g., World Nature Organization, Green Peace) and volunteer organizations (e.g., Humane Society) in promotion vehicles could demonstrate that the sustainable shopper has a large following (à la a group).

The positive association between power motivation and conspicuous consumption also is redolent of what upscale and luxury marketers might pursue. Showing well-known, successful personalities who tend to be influencers using their products could lead power-motivated consumers to purchase such items. Also, presenting vignettes of mainstream individuals consuming such products and the seeming salutary impact doing so has on the protagonists’ sense of power could be employed.

5. LIMITATIONS AND FUTURE RESEARCH

The present investigation possesses certain key limitations. Some might argue that explicit goals are manifestations of implicit motives (Murray 1938). Others, however, believe that the two systems are unrelated (McClelland 1989; Michalak et al. 2006). The relationship between implicit and explicit goals and motives poses a limitation for this study, as only explicit motives were explored. Therefore, future work should examine the impact of both explicit and implicit motives, as well as congruency between the two motives, on consumer behaviours.

Also, in focusing on cognitive and conative variables—self-discrepancy and motivation, respectively—a limited model was proposed and tested. Consequently, other variables that could affect conspicuous and sustainable consumption were omitted. Therefore, subsequent empiricism might explore the concatenation of variables in this study while incorporating additional variables, such as involvement, importance of the purchase, kind of product or service, and price. Moreover, the sample was comprised chiefly of younger-aged individuals (mean = 22 years). Self-discrepancies and their significance may well vary across age and should be reconnoitered in future work.

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Context Specific Complexity Management – A recommendation model for optimal corporate complexity

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Abstract

Companies face emerging external complexities that they must respond to with internal complexity to be able to perform on a superior performance level. On that account, an application-oriented methodology to support the context specific selection of appropriate complexity management methods for accomplishing the optimal level of internal complexity is lacking. A complexity management model is introduced that tackles this deficiency. Based on the identification of 37 complexity drivers that determine corporate complexity and 81 complexity management methods from literature, an assignment matrix with 2,997 relations between complexity drivers and methods is stretched. A scoring algorithm uses these relations to generate a sorted list of appropriate management methods for a specific complexity context determined by relevant complexity drivers. The approach is operationalized by a software prototype and evaluated through six interviews with experts from the field who confirmed practical relevance, appropriateness, and value-added of the provided management recommendation.

Keywords: complexity management, recommendation model, complexity drivers, law of requisite variety, scoring algorithm
1 INTRODUCTION

Modern industrial companies face an environment characterized by uncertainty and dynamics (Vrabic 2012). Thus, the basis of a company’s long-term success lies in the adaptability of its business processes. In industrial practice, however, this desire for flexibility often leads to an increased company internal complexity (Vrabic 2012). Pellissier (2012) states that both research and practice come to the conclusion that overly complex companies cannot survive in the market over the long term. This basic statement is supported by numerous other studies (e.g., Kim and Wilemon 2012; Axley and McMahon 2006). On the other hand, Axley and McMahon (2006) see a certain degree of complexity as a positive and essential property of companies. They explain that a system can achieve more flexibility with an increasing complexity of elements and relations, which in turn increases the company’s ability to adapt to different environmental conditions. This leads to an extended survivability of the company (Pellissier 2012; Isik 2010).

Owing to the fact that in industrial companies production greatly contributes to the value added, it can be assumed that the complexity of production processes significantly influences the overall corporate complexity (Kim and Wilemon 2012). Hence, it is necessary to tailor the application of complexity management methods to the production specific initial situation. A thorough outline of existing complexity management methods is lacking. As a consequence, complexity management poses a considerable challenge for companies (Pellissier 2012; Axley and McMahon 2006). Responsible managers (e.g., production managers) oftentimes lack comprehensive knowledge about the entirety of available complexity management methods or solely rely on a specific method they already applied in other application scenarios (Hickey and Davis 2004).

Therefore, this contribution addresses this gap and presents an approach that provides the possibility to systematically integrate specific situational production contexts into the selection of appropriate management methods. Like this, the approach expands the existing work in complexity research by a systematic linkage of the area of application with the corresponding managerial solution space.

Consequently, the aim of this work is to design and develop an approach for the recommendation of complexity management methods in form of a rated list of context-appropriate complexity management methods. This results in the following research questions:

RQ1: Which complexity drivers exist in production-related fields of application?
RQ2: Which methods exist to effectively manage complexity?
RQ3: How can appropriate methods for a specific complexity issue be identified and recommended?

To answer these questions, first complexity drivers are identified and classified based on existing literature. Subsequently, appropriate and well-tried complexity management methods are collected from literature. Based on this groundwork, a scoring algorithm to provide users with context-appropriate management methods is deduced. This bases on a quantified allocation of complexity drivers and appropriate methods by means of a two-dimensional assignment matrix.

Finally, the evaluation of the presented recommendation approach by means of six semi-structured expert interviews is briefly displayed. The contribution concludes with a discussion of impact and limitations and a summarizing conclusion.

2 BACKGROUND

Companies are generally understood as complex systems (e.g., Holland 2006; Pellissier 2012; Suh 2005). A company's complexity has numerous different drivers that can influence and reinforce each other. Literature oftentimes differentiates between structural and functional complexity (Godfrey-Smith 1998). The structural complexity is to be understood as an objective characteristic of a company. It includes exogenous complexity (social complexity, market complexity) and endogenous complexity (correlated and autonomous corporate complexity). The handling and management of complexity, however, always associates with the subjective perception of internal and external business factors and subsumes functional complexity. Pellissier (2012) considers a certain level of business complexity as a positive and vital capacity. A company therefore does not necessarily reach its complexity optimum when it has the lowest possible complexity (Marti 2007, Kim and Wilemon 2012). Ashby’s Law of Requisite Variety supports this hypothesis (Ashby 1970). He states that only an equally strong internal system complexity can counter the complexity of the system environment (e.g., the company environment) (Ashby 1970). Thus, it is clear that both a deficiency as well as an excess of complexity impede the sustainable business success alike. Consequently, complexity can never be completely eliminated without jeopardizing the company's existence.

A sizable number of researchers delve quantitative dimensions of complexity and especially focus on the measurement of complexity (e.g., Smart et al. 2013, Isik 2010, ElMaraghy and Urbanic 2003, Vrabic 2012). In this context, for example Smart et al. (2013) apply an information-theoretic view on dynamic and static complexity measures and concentrate on the amount of information needs within manufacturing systems. Isik
(2010) stresses an entropy-based approach for measuring supply chain complexity and ElMaraghy and Urbanic (2003) emphasize on complexity measurement considering process, product and the cognitive manufacturing system complexity. Vrabic (2012) assesses a metric for operational complexity to support the subsequent derivation of management activities. They clearly dissociate the scope of their research from the management of complexity that chronological succeeds the measurement of complexity (Isik 2010).

Nevertheless, several complexity management approaches that substantially build on the (quantitatively or qualitatively) determined condition of system states are described in literature (e.g., Marti 2007; Windt et al. 2008; Urbanic and ElMaraghy 2006). Marti (2007) investigates the trade-off between internal and external product complexity dimensions and derives guidance for optimizing product architecture. Areas up- and downstream (or parallel) to the product design are not considered. Windt et al. (2008) operationalize complexity in the dimensions systematic, organizational and time-related complexity by creating complexity vectors. Analyzing these vectors allows figuring out the optimal configuration of the manufacturing system. Anyway, Windt et al. (2008) also rather focus on the complexity-based determination of manufacturing systems than on the management of complexity within a settled system. Urbanic and ElMaraghy (2006) scrutinize manufacturing complexity to develop a manufacturing complexity index with focus on the identification of product and production related leverage points for optimizing complexity, but do not provide methodical guidance for coping with this complexity. Suh (2005) bases his complexity research on the time independent and time dependent characterization of manufacturing systems and derives implications how to optimize the system layout with regard to the fulfillment of production tasks. Methodical guidance for coping with complexity within an (temporary) immutable manufacturing system is no focal point of his approach. Other approaches such as Gegov et al. (2014) or Bosch et al. (2013) provide very abstract methodologies that are hard to operationalize in practice. The following table summarizes the described research approaches.

### Table 1: Literature overview

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Basic idea/concept</th>
<th>Complexity measurement</th>
<th>Complexity management</th>
<th>Management focus</th>
<th>Application orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suh (2005)</td>
<td>Optimizing system design based on complexity assessment</td>
<td>X</td>
<td>System redesign</td>
<td>Middle to high</td>
<td></td>
</tr>
<tr>
<td>Marti (2007)</td>
<td>Optimizing product architecture based on product complexity</td>
<td>X</td>
<td>Product architecture</td>
<td>Middle to high</td>
<td></td>
</tr>
<tr>
<td>Windt et al. (2008)</td>
<td>Characterization of complexity in production systems</td>
<td>X</td>
<td>None</td>
<td>Middle</td>
<td></td>
</tr>
<tr>
<td>Lindemann (2009)</td>
<td>Optimizing product design based on complexity assessment</td>
<td>X</td>
<td>Product design</td>
<td>Middle</td>
<td></td>
</tr>
<tr>
<td>Isik (2010)</td>
<td>Optimizing complexity in supply chains</td>
<td>X</td>
<td>None</td>
<td>Low to middle</td>
<td></td>
</tr>
<tr>
<td>Vrabic (2012)</td>
<td>Assessing manufacturing system complexity based on statistical complexity metric</td>
<td>X</td>
<td>None</td>
<td>Middle</td>
<td></td>
</tr>
<tr>
<td>Kim and Wilemon (2012)</td>
<td>Characterization of complexity in product development projects</td>
<td>X</td>
<td>None</td>
<td>Low to middle</td>
<td></td>
</tr>
<tr>
<td>Smart et al. (2013)</td>
<td>Measuring system complexity based on information entropy</td>
<td>X</td>
<td>None</td>
<td>Middle</td>
<td></td>
</tr>
</tbody>
</table>

In a nutshell, prevailing approaches either focus on the quantitative assessment of complex situations within production near fields without providing recommendations for coping with these situations or - if they do - lack practical applicability. An application oriented approach to support management of complexity by systematically mapping the problem area to the existing managerial solution space is missing. Therefore, the subsequently described approach is designed to provide a quantitatively rated recommendation of management methods that most likely suit to defer the corporate complexity towards the complexity optimum.
3 COMPLEXITY MANAGEMENT RECOMMENDATION APPROACH

3.1 Methodology
One of the primary goals of this work is the identification of complexity drivers and suitable methods for complexity management in production processes. The identification bases on the approach of Webster and Watson (2002) and comprises three basic steps. First, leading journals and publications are considered. Second, a backward path review by analyzing citations from the publications identified in step one is conducted. Third, the insights from the first two steps form the input for a forward path review. In accordance with the approach of Parthiban et al. (2013), some selection criteria based on analogous research approaches were chosen to select and define appropriate complexity drivers and management methods. These criteria are (1) a comparable level of granularity, (2) the assignability to production or production-related fields of application, and (3) the availability of more than one distinct source. In order to make the identified complexity drivers and management methods usable for the complexity management recommendation, they are subsequently grouped into classes referring to Belliveau et al. (2002).

3.2 Identification of complexity drivers and management methods
Table 2 shows the list of 37 identified production-related complexity drivers.

Table 2: List of identified complexity drivers

<table>
<thead>
<tr>
<th>Complexity driver</th>
<th>Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number &amp; strength of competitors</td>
<td>A, B, C</td>
</tr>
<tr>
<td>Velocity of market change &amp; competitive dynamics</td>
<td>B, C</td>
</tr>
<tr>
<td>Globalization</td>
<td>B, C</td>
</tr>
<tr>
<td>Number &amp; heterogeneity of customers</td>
<td>B, C</td>
</tr>
<tr>
<td>Degree of participation</td>
<td>A, B, C</td>
</tr>
<tr>
<td>Variety of customer requirements</td>
<td>A, B, C</td>
</tr>
<tr>
<td>Market dynamics</td>
<td>B, C</td>
</tr>
<tr>
<td>Global requirements</td>
<td>B, Q</td>
</tr>
<tr>
<td>Demand uncertainty and volatility</td>
<td>A, P</td>
</tr>
<tr>
<td>Variety of supplier base</td>
<td>C, P</td>
</tr>
<tr>
<td>Diversity of sourcing strategy and concept</td>
<td>B, K, N</td>
</tr>
<tr>
<td>Variety of sourcing objects</td>
<td>C, K, O</td>
</tr>
<tr>
<td>Availability of resources</td>
<td>F, J</td>
</tr>
<tr>
<td>Demand volatility</td>
<td>B, C</td>
</tr>
<tr>
<td>Uncertainty of delivery dates and quality</td>
<td>B, C</td>
</tr>
<tr>
<td>Number of employees and their interfaces</td>
<td>A, E</td>
</tr>
<tr>
<td>Quality of Know-how, experience and qualification</td>
<td>D, I</td>
</tr>
<tr>
<td>Language, culture and communication barriers</td>
<td>A, E</td>
</tr>
<tr>
<td>Speed of technological change</td>
<td>A, B, C, D</td>
</tr>
</tbody>
</table>

Legend of sources

<table>
<thead>
<tr>
<th>Source(s)</th>
<th>Source(s)</th>
<th>Source(s)</th>
<th>Source(s)</th>
</tr>
</thead>
</table>

Following the approach of Belliveau et al. (2002), in total nine complexity driver classes could be differentiated.
Table 3 lists these classes and depicts the assignment results of the complexity drivers to the appropriate class.

**Table 3: Classified complexity drivers**

<table>
<thead>
<tr>
<th>Class (c)</th>
<th>Complexity drivers (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1: Competition complexity</td>
<td>1; 2; 3</td>
</tr>
<tr>
<td>C2: Customer and demand complexity</td>
<td>4; 5; 6; 7; 8; 9</td>
</tr>
<tr>
<td>C3: Supplier and sourcing complexity</td>
<td>10; 11; 12; 13; 14; 15</td>
</tr>
<tr>
<td>C4: Personnel complexity</td>
<td>16; 17; 18</td>
</tr>
<tr>
<td>C5: Technology complexity</td>
<td>19; 20; 21</td>
</tr>
<tr>
<td>C6: Product, product program and production program complexity</td>
<td>22; 23; 24; 25</td>
</tr>
<tr>
<td>C7: Process complexity</td>
<td>26; 27; 28; 29; 30</td>
</tr>
<tr>
<td>C8: Organizational complexity</td>
<td>31; 32; 33</td>
</tr>
<tr>
<td>C9: Complexity of information, planning, management and control</td>
<td>34; 35; 36; 37</td>
</tr>
</tbody>
</table>

After the identification and classification of different complexity drivers, subsequently appropriate complexity management methods that are suitable to cope with complexity are identified from literature. In this context, complexity management methods are interpreted as a generic term for all those actions, initiatives, projects or programs that can be used to systematically and reproducible influence complexity towards the complexity optimum.

To enable the assignment of different complexity drivers to adequate complexity management methods, the identified methods divide into classes following the line of action described in section 3.1. Thus, the driver classes equally serve as classification scheme for the complexity management methods and facilitate the distinction of relevant from irrelevant methods. In contrast to the classification of complexity drivers, an assignment of individual methods to more than one class is possible. In the course of the described approach, the following 81 complexity management methods could be identified and assigned to their corresponding class(es), as depicted in Table 4.

**Table 4: Classified complexity management methods**

<table>
<thead>
<tr>
<th>Class (c)</th>
<th>Complexity management methods (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1: Competition complexity</td>
<td>Creation of imitation and market entry barriers; Decision about market exhaustion or dismissal; Market diversification; Exploitation of market niches</td>
</tr>
<tr>
<td>C2: Customer and demand complexity</td>
<td>Decision about market exhaustion or dismissal; Exploitation of market niches; Market diversification; Market segmentation; Direct and indirect customer settlement; Quality Function Deployment; Blocking; Packaging; Premium standards; Premium finishes; Direct and indirect program settlement; Variety Reduction Program; Creation of product-market combinations; Creation of performance systems; Build-to-order</td>
</tr>
<tr>
<td>C3: Supplier and sourcing complexity</td>
<td>Supplier integration; Creation of company networks; Creation of company networks; Full-range assortment through acquisition; Modular and system sourcing; Single sourcing; Variant Mode and Effect Analysis; Just in Time; Just in Sequence; Vendor Managed Inventory; Kaizen</td>
</tr>
<tr>
<td>C4: Personnel complexity</td>
<td>Creation of company networks; Personnel development and qualification; Competency development programs; Shopfloor management; Outsourcing</td>
</tr>
<tr>
<td>C5: Technology complexity</td>
<td>Integration or elimination of technologies; Creation of technology combinations and technology platforms; Simultaneous engineering; Creation of company networks; Outsourcing</td>
</tr>
<tr>
<td>C6: Product, product program and production program complexity</td>
<td>Quality Function Deployment; Failure Mode and Effects Analysis; Blocking; Packaging; Reverse Engineering; Integral and differential design; Multimix manufacturing; Third party sourcing; Design for variety; Premium standards; Premium finishes; Direct and indirect program settlement; Variety Reduction Program; Functions integration; Standardization; Modularization; Systematization; Platforms; Sequence planning; Variant Mode and Effect Analysis; Outsourcing; Modular and system sourcing; Single sourcing; Simultaneous Engineering; Reduction of vertical range of manufacturing; Substitution of horizontal manufacturing through horizontal assembly; Variant dislocation; Dislocation of decoupling point, Lean Production</td>
</tr>
<tr>
<td>C7: Process complexity</td>
<td>Mizusumashi; Sequence planning; Multimix manufacturing; Dislocation of decoupling point; Process segmentation; Horizontal process integration; Outsourcing; Workflow analysis; Planning of the standard organization model; Value analysis; Kaizen; Variant Mode and Effect Analysis; Self-organization; Single Minute Exchange of Die; Andon; Autonomation; CONWIP; Heijunka; Poka Yoke; Shopfloor management; Low Cost Intelligent Automation; One Piece Flow; U-shaped cells; Line-back principle; Modularization of material flow system; Direct supply into production; Milkrun; Warehousing; Low level process analysis, Lean Production; Kaizen</td>
</tr>
<tr>
<td>C8: Organizational complexity</td>
<td>Kanban/Pull principle; Vertical autonomy; Hierarchy flattening; Planning of the standard organization model; Vendor managed Inventory; Drum-Buffer-Rope; Load oriented order release; Progress figure concept</td>
</tr>
<tr>
<td>C9: Complexity of</td>
<td>Lean Production; Build-to-Order; Six Sigma; Kaizen; Kanban; Self organization; Planning of the</td>
</tr>
</tbody>
</table>
3.3 Assignment matrix

In the previous section, complexity drivers as well as complexity management methods to cope with those drivers are identified and classified. At this point, the assignment process of methods to complexity drivers to stretch a two-dimensional assignment matrix is described. This allows the identification of suitable methods for a specific production-related complexity problem. The matrix comprises a total of 2,997 relations of \( m = 81 \) methods multiplied by \( d = 37 \) complexity drivers.

The mapping process is realized by means of a four-point scale in line with Hartley and Betts (2010). The scale aims to describe the effectiveness of the methods for specific complexity drivers. For each possible pair of complexity driver \( d \) and method \( m \), one of the values "-", "0", "+" or "++" is assigned. Here, "-" stands for a negative influence on the complexity. "0" means no or very little effect on the complexity. "+" denotes a positive influence on the complexity and "++" represents an extremely positive effect on the complexity level.

Method descriptions of respective literature primarily serve as the basis of the individual relations between methods and drivers in the allocation process. In about 20% of cases (for 16 methods) where the allocation of a method to one or more appropriate complexity drivers could not be directly derived from literature, a two-stage Delphi study has been conducted. For this, three experts from both a globally active producer of electronic devices as well as from a medium-sized company specialized on batch production served as participants of the study. The experts featured an average of 5.5 years of work experience in production related task fields and work as middle managers between top management and operational level in their company. All three of them explicitly had faced complexity issues in their work environment and thus featured sufficiently comprehensive expertise and experience to suit as experts (Glaeser and Laudel 2006). In the first round of the Delphi study, the experts assigned the respective methods to appropriate drivers. In the second round of the study, the experts had access to the other expert’s assessments that were anonymously made available to them. Based on this, the experts refined their rating from the first round. By doing so, the assignment results in an as objective as possible allocation. Table 5 shows an excerpt of the resulting assignment matrix. Above and to the right of the assignment matrix, aggregations of the individual ratings of relations ("-", "0", "+" or "++") can be found. The aggregation to the right of the matrix counts how many methods were rated with the values "-", "0", "+" and "++" for a single complexity driver. It answers the following question, regarding the methodical coverage of the complexity drivers:

1. How well are the distinct complexity drivers methodically covered by existing complexity management methods?

The aggregation above the matrix shows how many complexity drivers for a particular method exhibit an evaluation according to the defined scale. It answers the following question, regarding the methodical width and universality of the complexity management methods:

2. How many complexity drivers does a particular method address?

Referring to Macoun and Prabhu (1999), the aggregated values ("-", "+" and "++") are colored to point out the beneficence of both the methodical coverage of complexity drivers by existing management methods as well as the suitability of a distinct method for different complexity drivers. Here, black values indicate high quality (i.e. high methodical coverage or width), whereas dark grey values represent medium quality and light grey values indicate a poor quality. A high number of "++" - or "++"-ratings, as well as a small number of "-"-ratings thereby result in a black coloring. On the other hand, a variety of "-"-ratings and a small number of "++" - or "++"-ratings result in light grey coloring. Whether the aggregation of individual values is considered as "high (=black)" or "low (=light grey)" does not rely on absolute figures. It depends on how the number of current evaluations of the individual complexity driver or of the individual complexity management method compares to the number of the respective evaluation of all other methods and complexity drivers (Macoun and Prabhu 1999). "0"-ratings mark the non-existence of a relevant relation between a complexity driver and a complexity management method. Therefore, these aggregations will not be part of further considerations within this work.

### Table 5: Assignment matrix

<table>
<thead>
<tr>
<th>Complexities</th>
<th>Management methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information, planning, and control</td>
<td>Standard organization model; Single Minute Exchange of Die; Andon; Autonomation; CONWIP; Progress figure concept; Heijunka; Poka Yoke; Shopfloor management; Low Cost Intelligent Automation, Reduction of vertical range of manufacturing; Modularization of material flow system</td>
</tr>
</tbody>
</table>
3.4 Scoring algorithm
Based on the mapping results of the previous sections, now the recommendation algorithm is described. The approach bases on the score \( S_{med} \) which quantitatively expresses the suitability of complexity management methods for specific complexity situations (caused by specific complexity drivers). The score allows a ranked depiction of those methods that are most likely to defer the endogenous complexity towards the complexity optimum. In order to allow a nuanced proposal sequence, the scoring algorithm bases on two independent criteria. First, it considers the number of "++" - or "+"-ratings of the respective methods, as for each complexity driver \( d_i \) there are several methods \( m_k \) with "++"- and/or "+"-rating available (see Table 5). Second, the scoring algorithm additionally considers the "methodical width" of the methods. This width describes the scope of applicability of a method and is quantified in the following with a numerical value according to Golden-Biddle and Locke (2007). This value increases with the number of "++" - and "+"-ratings of a specific method and decreases with a rising number of "-"-ratings.
The ratings in the assignment matrix serve as basis for calculating the width of a method and are translated into the key figure $B_{d_i,m_x}$. This value describes the assessment of the complexity driver $d_i$ regarding the method $m_x$. It ranges from "-1" to "2" ($B_{d_i,m_x} \in [-1..2]$) and can be interpreted in accordance with Hartley and Betts (2010) as follows (see Table 6):

**Table 6: Interpretation of $B_{d_i,m_x}$**

<table>
<thead>
<tr>
<th>Value of $B_{d_i,m_x}$</th>
<th>Equivalent value from assignment matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>-</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>+</td>
</tr>
<tr>
<td>2</td>
<td>++</td>
</tr>
</tbody>
</table>

The assignment evaluation $B_{d_i,m_x}$ allows the calculation of the total score $S_{m_x}$ (methodical width of the method $m_x$) taking the varying weightings of the ratings "++", "+", "0" and "-" into account. For this reason, "0"-ratings are entirely excluded, while ":-"-ratings contribute negatively and "+" - or "++"-ratings contribute positively (single for "+" and double for "++"). This procedure ensures that the score weights those methods the most that show a high relevance to cope with a specific complexity problem (Golden-Biddle and Locke 2007).

To calculate the score $S_{m_x}$ of the respective method $m_x$, the sum of all 37 ratings $B_{d_i,m_x}$ for this method $m_x$ is added up. By calculating all possible scores $S_{m_x}$, the results can be represented as a sorted list of all the scores of 81 methods $m_x$ (sorted tuple $K_m$ of $S_{m_x}$). The higher the score $S_{m_x}$, the higher the width of each method $m_x$ for this respective score. This results in the mathematical relationships depicted in Table 7.

**Table 7: Calculation of $S_{m_x}$**

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Rating $B_{d_i,m_x}$ (evaluation of complexity driver $d_i$ regarding method $m_x$) $B_{d_i,m_x} \in [-1..2]$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Score $S_{m_x}$ (methodical width of method $m_x$) $S_{m_x} = \sum_{i=1}^{37} B_{d_i,m_x}$</td>
</tr>
<tr>
<td>Step 3</td>
<td>Sorted tuple $K_m$ of $S_{m_x}$ $K_m = (S_{m_1}, S_{m_2}, \ldots, S_{m_{81}})$ with $S_{m_k} \geq S_{m_{k+1}}$</td>
</tr>
</tbody>
</table>

4 EVALUATION

The following section shows the results of an evaluation study conducted to investigate the appropriateness, practical applicability and relevance as well as to identify potential weak-points and methodological gaps of the developed approach.

4.1 Methodology

To evaluate the approach six guided expert interviews with experts from four different large scale manufacturing companies with global business activities and a diversified product portfolio were conducted (for confidentiality reasons, the names of companies will not be mentioned). The experts have an average of 5 years of work experience in production or production-related fields. They are located in the middle management (reporting duties towards top management and instructional duties towards operational subordinates) and differ from those experts that participated in the Delphi study to stretch the assignment matrix. Following the suggestions of Glaeser and Laudel (2006), the experts that evaluated the overall approach featured explicit experience in complexity management issues in their professional environment and thus suit as experts for the evaluation study.

In advance, a software prototype that operationalizes the algorithm and visualizes the recommendation result in a user-friendly and time-saving manner was developed. The software architecture comprises the layers data management, business logic and representation, derived from functional criteria according to Jablonski (2004). The data layer contains the identified complexity drivers, the complexity management methods and the contents of the assignment matrix. The logic layer operationalizes the described scoring algorithm and the representation layer facilitates the dialogue between users and software. With the prototype, potential users are able to reconstruct the consecutive steps of the presented approach in practice to deduce the sorted tuple $K_m$, that displays the most suitable management methods for a specific complexity issue. In the first step, the user defines the relevant complexity driver classes (c) for the current application case and details his/her entries by selecting the relevant complexity drivers that are displayed according to the ticked classes. The scoring algorithm
calculates the score of all complexity management methods and identifies the ones with the highest score (see Figure 1). The depiction of more methods with lower scores is possible (“show all”).

**Figure 1: Screenshot of the complexity management method recommendation view**

Furthermore, the prototype provides the user with further information about the recommended complexity management methods and proposes methods that closely relate to the originally proposed ones. By doing so, the prototype supports a high degree of flexibility and alternative options with regards to the application of different methods.

### 4.2 Evaluation results

The interviewees were asked to apply three scenarios from their everyday work and within their area of authority to the proposed artifact. Based on these scenarios, the experts evaluated the outcomes provided by the recommendation approach and compared them to their expectations they had without the comprehensive support. Referring to Flick (2014) an interview guideline comprising open and closed statements was applied during the interviews and the experts assessed these statements applying the following scale (derived from Lantz 2013):

#### Table 8: Evaluation Scale

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Total approval</td>
<td>Total approval with the stated statement</td>
</tr>
<tr>
<td>2</td>
<td>Predominant approval</td>
<td>Approval with the statement in essence</td>
</tr>
<tr>
<td>3</td>
<td>Minor deviations</td>
<td>Approval with the statement in essence with minor deviations</td>
</tr>
<tr>
<td>4</td>
<td>Significant deviations</td>
<td>Partly approval with the statement with significant deviations</td>
</tr>
<tr>
<td>5</td>
<td>Denial</td>
<td>No approval with the statement and denial of (almost) all essentials</td>
</tr>
<tr>
<td>0</td>
<td>No assessment</td>
<td>No assessment</td>
</tr>
</tbody>
</table>

The following table briefly summarizes the evaluation results and provides an overview about the appraisement of both the approach and the prototype as given by the experts.
The expert survey shows that the relevance of complexity in production near fields is recognized. Thus, the provision of support for managing complexity in general was rated as desirable and meaningful. In this context, the presented complexity management recommendation approach satisfied the experts’ needs and expectations and meets their practical requirements. The integrated management methods exceed the knowledge base of the experts by far and are evaluated as valuable information base.

All experts agreed that the recommendation approach enhances their methodical knowledge significantly. Furthermore, all experts were united about the fact that the depiction of complexity drivers augments their view on complexity within their field of authority and leads to a more holistic determination of the initial situation. However, the experts 4 and 6 questioned the reasonableness of a supportive complexity management recommendation approach by itself and would rather rely on their personal expertise shaped by their long term work experience. Nevertheless, all experts considered the presented approach and the corresponding software prototype as a valuable source of inspiration and as a starting point for management activities in practice. Especially the provision of further information of potentially appropriate management methods entailing chances and risks as well as further readings and related method referrals meet the experts’ expectations (especially stated by experts 1, 2, 3 and 5).

In addition to the general consent of the interviewees about the presented recommendation approach and the prototype, also some suggestions to improve the approach and the prototype could be collected. All experts agreed that the approach as well as the prototypical realization should provide the possibility to complement the database with further methods or practices from the field to customize the recommendation results. Expert 1, 2 and 4 also stated that the prototype should display the systematic steps for building the ranked method recommendation to ease the justification of the user’s method choice towards superior and subordinate hierarchy levels.

5 DISCUSSION

Certain limitations with regards to dependability, reproducibility, and generalizability of the presented approach need to be mentioned. The identification of relevant complexity drivers and of complexity management methods as well as the compilation of the assignment matrix strongly rely on the qualitative assessment of research literature and expert opinions and thus run the risk of distorted results (Venkatesh et al. 2013). In addition, solely field-tested approaches without comprehensive scientific grounding are not considered for the recommendation approach. Furthermore, the scoring algorithm that calculates the rank order of the most suitable complexity management methods simplifies the interrelations between various complexity drivers and complexity management methods. The corresponding risk of an oversimplified representation of results should
be investigated in further research activities. Finally, the evaluation grounds on the assessment of six experts that distinguish themselves as practitioners and middle managers in production or production near fields with sufficiently relevant work experience. Although this evaluation already provides valuable information about the presented approach, an in-depth evaluation with a greater number of participants in a field study with a pre-post-measurement of corporate complexity (compared to the complexity optimum) will be conducted.

6 CONCLUSION

The developed recommendation approach is based on a data set comprising 37 complexity drivers and 81 complexity management methods, resulting in a data pool of in total 2,997 relations between complexity drivers and management methods. A scoring algorithm calculates the rank order of the most suitable complexity management methods for specific complexity issues. With this algorithm a selection and allocation of appropriate management methods for a distinct complex situation is provided. A corresponding software prototype operationalizes the theoretic approach and is adapted to the requirements of practitioners in production or related application fields.

The general appropriateness of the presented approach has been confirmed during six semi-structured expert interviews. To conduct the interviews, the approach was implemented in practice by using the software prototype. The prototype represents both the content-related groundwork (complexity drivers and methods) and the scoring algorithm and was applied in the course of the experts’ interrogations, during which the experts assessed the completeness, applicability, and appropriateness of the recommendation approach. It was shown that the recommendation approach generally meets requirements from practitioners. It was evaluated as a valuable artifact to broaden the methodological knowledge base of managers in charge.

In conclusion, the recommendation approach for complexity management is a valuable artifact that has the potential to facilitate and support both theorists and practitioners in coping with complexity issues. Especially the line-up of the comprehensive method collection represents a worthwhile supplement to complexity management know-how. The approach helps to tailor existing management options to specific corporate situations by systematically aligning the managerial solution space with specific problem contexts.

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