HIGH IMPACT SCALES IN MARKETING: A MATHEMATICAL EQUATION FOR EVALUATING THE IMPACT OF POPULAR SCALES

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Abstract: *Decision making in any industry is heavily dependent on the availability of right measures and the appropriate tools arriving at the right measures. Scale development, therefore, is a very critical part of understanding and building knowledge in any subject.*

Marketing instruments are often used in research without sufficient evidence of their reliability. Often new scales are developed for each single instance of study or application. Conflict and disagreement on the basic definition of the construct, further leads to little agreement about which pre-existing scale to use, or does a situation warrant the creation of a new scale altogether.

Study of popular marketing scales, their limitations and potential research directions to overcome those is the agenda of this study. The methodology used is exploratory research based on literature and secondary data, combined with expert opinion of practitioners from the industry. We understand what constitutes a high impact scale and what factors determine whether a scale is deemed high impact by practitioners. Discriminant Analysis is applied to arrive at the same.

Keywords: Scale development, Scale limitations, Scale selection, Scale proliferation, Scale life cycle, High impact scales, Scale quadrant

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Introduction

Various models, theories and constructs in marketing have seen the creation and evolution of a range of scales and measures. The purpose of these is to provide a reasonable estimate and enable decision making across various aspects of the subject at hand. Marketing scales are being created for all kinds of measures, across multiple categories and attributes. The process of measuring marketing constructs is clearly larger than just assigning numbers to objects that represent a quantity of some attribute that is being measured. Rather, it aims to provide a mechanism to analyze a construct and enable informed and intelligent decision making through the actionable intelligence that a scale equips a decision maker with.

Scaling is the branch of measurement that involves the construction of an instrument that associates qualitative constructs with quantitative metric units. As defined by S.S. Stevens, Scaling is the assignment of objects to numbers according to a rule. It is a means to measure an entity or a subject. Sometimes we do scaling to test a hypothesis. We might want to know whether the construct or concept is a single dimensional or multidimensional one. Sometimes, we do scaling as part of exploratory research. We want to know what dimensions underlie a set of ratings. But probably the most common reason for doing scaling is for scoring purposes. When a participant gives their responses to a set of items, we often would like to assign a single number that represents that person's overall attitude or belief.

Scale development has evolved largely over the last few decades, and there has been considerable progress in the assessment of constructs, and also in the creation of the measurement methods. Path breaking work done by Churchill (1979) presented a framework for creating better measures of marketing constructs building on the research done by Cronbach (1951) and Nunnally (1967).

Focus on creating measures has been towards better definition of the construct, greater validity and higher reliability. Various researchers have developed a plethora of methods for developing measurement scales refining or modifying Churchill’s framework, and presenting alternate approaches to measuring various marketing subjects. Oczkowski and Farrell (1998) bring out the fact that following the development of Churchill’s framework there has been a six-fold increase in the number of new scales published in premier marketing journals.

This study of scale development and their applications is an aim to understand how the highly cited and impactful scales are utilized in the practical world. The main object of the study is to understand the popular scales, their creation, limitations and application in the practical world covering the following subjects

- Popular scale development frameworks.
- Understanding and evaluation of selected scales
- An analysis of the strengths and weaknesses of the selected scales
- The development of Scale vs Attribute representation based on expert opinion.
- The development of Scale vs Attribute representation based on academic literature review

The study of the scale development and their application, however, is limited to few aspects of the field of marketing.

Understanding Frameworks, Models and Scales

The fundamental principles of marketing are grounded in theories around customer identification and building customer insights. Measurement and analysis of certain basic constructs that define these parameters therefore becomes a critical first step to taking any marketing decisions for business. In this paper, we identify some of these basic constructs and their measurement scales from a state of the art and contemporary validity perspective.

Oftentimes we see words such as framework and model being used interchangeably. At the onset, let us first clarify the difference from a measurements perspective. A framework is a set of assumptions, concepts, values, parameters or practices that constitute a way of viewing reality. One can develop a framework to understand a phenomena or a process by defining its parameters or identifying the elements that constitute or effect or enable that phenomena or process. A framework is developed with a set of assumptions about what aspects of the phenomena will enable its measurement, in a given context – hence different researchers offer different perspectives and frameworks to measure the same construct.

A model, however, is a simplified representation of a system or phenomena with any hypothesis required to describe the system or explain the phenomenon, often mathematically. It offers a human construct to help us better understand real world systems. All models have an information input, an information processor and an output of expected results.

The difference between a framework and a model is that a framework is used to identify various aspects of a situation and define their inter-relationships. A model is applied to a framework or a situation to derive some output or predict the behaviour of the parameters.

Scales are used to measure various parameters of a framework in order to determine a definitive assessment of a phenomenon in a specific situation or context. A scale represents a system of grouping or classification in a series of steps or degrees according to a standard of relative size, amount or rank. Scale is an ordered reference standard which helps judge the degree of a phenomenon and enables decision-making, judgment and analysis around it. Scaling involves construction and identification of a measure that associates qualitative constructs with quantitative metric units.

The theory and constructs of marketing necessitate the need for defining and conceptualizing frameworks that explain abstract phenomena. Oftentimes, the definition of a framework is constrained by its assumptions, context definition and dynamism of the environment or extraneous factors. The scales to measure these frameworks, therefore, need to evolve and also be applied in sync with the defined contexts. In this exploratory study we first explore various high impact measures applied in marketing and investigate their applications and limitations.

Literature Review

Churchill (1979) provided a methodical approach to creating these marketing measures, and then further ensuring that the developed measures meet the inherent requirements of validity and reliability. The process framework given by him translates the creation of marketing scales into a six step process of: (1) specify domain of the construct, (2) generate sample of items, (3) purify measure, (4) assess reliability of construct, (5) confirm validity of measure, (6) define norms for making the standards explicit.

The Churchill procedure lays out a step-by-step method for defining and empirically validating constructs. It has laid the foundation for improvement of the quality of measurement in marketing, Finn and Kayande (2005). Despite having been criticized for being biased and limited, it still remains the main scale development procedure that marketing researchers apply.

Viswanathan et al (1996) propose the application of fuzzy set theory to scale development by conceptualizing response categories as fuzzy sets.

Rossiter (2002) proposes a new procedure for scale development that relies on logical arguments and the concurrence of experts, based on open-ended inputs from pre-interviews with raters. Christened C-OAR-SE, this six step process involves: (1) Construct definition, (2) Object classification, (3) Attribute classification, (4) Rater identification, (5) Scale formation, (6) Enumeration and reporting.

The author alleges that definition and measurements across various popular constructs in marketing are of suspect validity, and C-OAR-SE is a theoretical and procedural solution to the same.

A radical shift from the approach outlined by Churchill, it is seen as more flexible and open minded and provides a 'fresh breadth' of developing scales in marketing, Diamantopoulos (2005); Finn and Kayande (2005). C-OAR-SE is grounded in rationalism rather than pure empiricism and relies on logical arguments and concurrence of experts. However, C-OAR-SE puts a greater emphasis on context dependence and expert judgment, which might sometimes be suspect, Finn and Kayande (2005).

Finn and Kayande's offer the multivariate generalizability theory approach to developing measurement scales. This offers an opportunity to integrate the C-OAR-SE method to improve the conceptual rigor and empirical validation of constructs. Further, it applies statistical analysis to empirically test samples. This procedure, however, has been criticized for being too complicated and has seen limited application.

Use of multi-item scales, as against a single response category, has been fairly common in academic researches. "A single response category may not completely capture a response if the sets of response categories do not match the natural response of respondents", Viswanathan et al (1996). Further, use of contemporary techniques, such as structural equation modelling (SEM), allows researchers to objectively compare a theoretical model with empirical data. Several advantages of SEM have been described, most important ones being its ability to control for measurement error and to provide tests of construct validity, Terblanche and Boshoff (2006).

A basic layout of the process of Scale development is depicted in the Table below.

Table I: Scale Development Process

Task	Activities involved	Reason
Define the subject	Search literature and substantiate with practical situations to define the construct to be measured.	Clearly separate what is to be measured with what is to be left out, and what parameters are adequate to understand the subject.
Elaborate the items	Use literature, secondary research and discussions with relevant audience to create universe of items that would address the parameters of the construct	Put together a list of statements or questions that, when responded to, would cover various aspects of the construct to be measured
Narrow down to the most relevant items	Assess internal homogeneity of the measure – calculations such as those of coefficient alpha and factor analysis can help in determining and separating out less relevant items. The researcher can also bring in expert judgment to eliminate less relevant items.	Using a relevant sample data and calculating these statistics can enable the researcher to eliminate items which do not hold as strong a representation of the construct.
Check for relevance and correctness	Ensure that the scale measures what it is set out to, and shows consistency across different methods.	An internally homogeneous set of items is not sufficient, and it needs to be ensured that the measure is valid and reliable before it can be put into practice.
Give a final shape to the items, construct and scale	Develop norms and processes to clearly lay out the marketing and scale value proposition.	A formal definition needs to be imparted to the construct, elements of its scale and the analysis of its response.

Caveats in Scale development

Development of new scales has often been done without establishing any relationships with existing scales or showing justification for development of new scales, for areas where scales already exist. In fact, in many cases core concepts have been defined in multiple ways by scores of researchers, not building on existing definitions, but rather ending up confusing the basis of the construct. "More stupefying than the sheer number of our measures is the ease with which they are proposed and the uncritical manner in which they are accepted", Jacob Jacoby (1978).

Unfortunately, scale proliferation has been rampant and research suggests that there have been many instances when existing scales are not used, but instead new scales are developed for each single instance of study or application. For most constructs, there is little agreement about which pre-existing scale to use, or does a situation warrant the creation of a new scale altogether, Bruner (2003). Oftentimes, scale validity and reliability are a question, and actual application of the scale in both research and business situations does not happen. Bruner has argued for increased use of standardized scales to avoid proliferation of duplicate scales which in turn has been criticized as not being reflective of the different cultural and lifestyles that researchers are bound to find in different markets, Fletcher and Fang (2006).

Important Attributes of Scales

While elaborating on scales and their evaluation from a literary perspective, the following attributes have been seen as both academically and practically relevant. Therefore, these factors have been considered later in the study as well, to categorize scales as high or low impact. The factors are detailed below:

Table II: Important Attributes of Scales

Attribute	Definition	References
Validity	A measure is valid when the differences in observed scores reflect the true differences on the characteristic one is attempting to measure and nothing else.	Churchill (1979), Jacoby(1978), others

Reliability	A measure is reliable to the extent that independent but comparable measures of the same trait or construct of a given object agree	Churchill (1979), Jacoby(1978), others
Utility	The word utility indicates ‘usefulness or a potential capacity to provide a service’.	Salway (1986), Jones et al., (2006)
Predictability	It should be possible to show, demonstrate or prove that requirements are met subject to any assumptions made	Srivastava (2002), Stankovic (2003)
Universality or Generalizability	The degree to which one can generalize the data collected to a larger universe.	Rentz (1987), Aaker (1996), Bruner (2003), Dadzie et al (2002)

Review of Chosen Scales

Having considered the critical and fundamental aspects of the marketing function, the following scales and models have been shortlisted as part of this exploratory study.

Table III: List of Chosen Scales

S.No	Name and Description of Scale	Author(s)	Year
1	MARKOR as a measure for market orientation	Ajay K. Kohli, Bernard J. Jaworski and Ajith Kumar	1993
2	VALS Framework for Psychographic Segmentation	Arnold Mitchell, SRI Consulting Business Intelligence (SRIC-BI)	1983
3	Dimensions of Brand Personality	Jennifer Aaker	1997

4	SERVQUAL	Parasuraman A., Zeithaml Valarie A., Berry Leonard L.,	1988
5	DAGMAR approach to measuring advertising effectiveness	Russell Colly	1962
6	SOCO scale for measuring sales person's customer orientation	Robert Saxe and Barton A. Weitz	1982

MARKOR as a measure for market orientation

The market orientation concept has been instrumental in building the philosophy of the marketing subject. Market orientation, irrespective of industry category or vertical, has witnessed a lot of interest, both in research and in actual applications in the market, Han, Kim, and Srivastava (1998); Kohli and Jaworski (1990). Implementing the marketing concept is a reflection of an organization's intentions to deliver higher value to its customers, Slater and Narver (1994).

Market orientation refers to the organization-wide generation of market intelligence through decision support systems, marketing information systems, marketing research efforts, dissemination of the intelligence across company departments, and organization-wide responsiveness to the changes taking place in the environment, Kohli and Jaworski (1990).

The MARKOR scale is a maiden attempt to develop a measure for marketing orientation and assess its psychometric properties, Kohli, Jaworski and Kumar (1993). The three basic concepts of market orientation have been identified as – intelligence generation, intelligence dissemination and responsiveness. Measurement of market orientation, therefore, is an attempt to understand how much effort an organization puts into generating intelligence regarding its customers, their current and future needs, how the organization disseminates this information across its various stakeholders, and how well it responds to this information.

The MARKOR measure assesses the degree to which a business unit or an organization (1) engages in multi-department market intelligence generation activities, (2) disseminates this intelligence vertically and horizontally through both formal and informal channels, and (3) develops and implements marketing programs on the basis of the intelligence generated, Kohli, Jaworski and Kumar (1993).

Using the MARKOR assessment questionnaire, one can define a baseline level of market orientation for any organization. Based on how the organization plans its programs and marketing strategy, the measure offers a mechanism to check progress on this front. Comparative checks of this sort over a medium to long-term period will enable an organization to identify and isolate major challenge areas and plan for programs to address the same, in the process becoming more in sync with the marketing orientation philosophy.

Empirical evidence demonstrates the universal applicability of MARKOR scale in different settings, John E. Spillan, (2005). MARKOR is largely consistent with its definition. It is believed to be a good market orientation measurement because it provides an expanded focus on the market rather than customer intelligence, an emphasis on a specific form of inter-functional coordination with respect to market intelligence, and a focus on activities related to intelligence processing rather than the effect of these activities, Kohli, Jaworski and Kumar (1993). Academicians have argued, however, that using short-term financial measures of performance may not be complete and adequate to measure the impact of adopting a market orientation approach. There may be a need to improve the method of measuring the long-term effects of market orientation, as also incorporate elements that are not accounted for in this scale. Examples include situations where customer feedback might not give a complete and truthful representation of customer needs, such as in cases of highly innovative and revolutionary new products, or in situations that demand a high level of organizational creativity.

Findings suggest that MARKOR may lack generalizability across industries, economies and cultures and more fundamentally the conceptualization on which it is based may need to be reassessed. The fact that its statistical validity is questionable, which is acknowledged by the authors themselves, has invited researchers to improve the original instrument to make it more reliable and better connected with its conceptual foundations.

VALS Framework for Psychographic Segmentation

Probably the best-known psychographic segmentation tool is VALS, developed in 1978 by the research firm SRI International, Mitchell and others (1983). The VALS system was developed from a large study of the U.S. population that divided adults into nine segments based on similarities in their values (beliefs, desires, and prejudices) and their lifestyles. Grounded in the belief that mind-set and demographics work together to determine underlying consumer choices and preferences, VALS helps predict consumer behaviour. An individual's primary motivation pattern elements are isolated and that brings in predictability about how the person will behave in the marketplace.

According to the VALS Framework, people are categorized along two dimensions. The vertical dimension segments people based on the degree to which they are innovative and have resources such as income, education, self-confidence, intelligence, among others. The horizontal dimension represents primary motivations and includes three distinct types: Consumers driven by knowledge and principles or by demonstrating success to their peers or by a desire for variety, and risk taking are motivated primarily by self-expression. At the top of the rectangle are the Innovators, who have such high resources that they could have any of the three primary motivations. At the bottom of the rectangle are the Survivors, who live complacently and within their means without a strong primary motivation of the types listed above.

In 1990 SRI introduced VALS2 to reflect changes in the way decisions were made. Three self-orientation patterns included in VALS2 are principle-oriented (your choices are directed by your beliefs), status-oriented (your choices are directed by your desire for the approval of others), and action-oriented (your choices are directed by your desire for physical or social activity, variety, or risk taking).

VALS is used extensively in new product development, crafting communication strategies, identifying emerging market opportunities, and helping predict consumer attitude towards new policy development. VALS2 is a step ahead of the initial VALS framework, which takes into account changing dynamics.

However, inherently values are difficult to measure even within homogeneous cultures. Values are among the most abstract of social cognitions, Kahle (1984), thus rendering them elusive to highly concrete measure. Irrelevant needs, salience, super-ordination, impression management, social change, excessive abstractness, and ambiguity of meaning may all distort self-reports of values, Beatty et al (1988).

The VALS approach has some inherent limitations associated with the measurement of values. Further, both the collection and analysis of data are a fairly tedious process, and is susceptible to a reasonable degree of cultural bias. The meanings and nuances of a set of attitudinal and behavioural statements leave room for a distortion and ambiguity. Some of the statements seem particularly tied to the U.S. culture and need considerable modification. VALS' heavy dependence on demographics suggests it is not a pure measure of values or psychographics, which reduces the theoretical importance of the methodology and conceptualization, Beatty et al (1988).

Brand Personality

Brand Personality as conceptualized by Jennifer Aaker (1997) is 'the set of human characteristics associated with a brand.' Brand personality gives the consumer something to relate to that is vivid, alive, and more complete than what is conveyed by the generic offering. A well-established brand personality can result in increased preference and usage, higher emotional ties to the brand, and trust and loyalty.

As organizations apply strategies to communicate a personality of a brand to its consumers, the idea is to create an impression that the consumer can identify with, or aspire for. Research suggests that higher the sync between the human characteristics that explain the behaviour of a target audience set, and those that describe a brand, the greater is the potential of preference for that brand, Malhotra (1988), Sirgy (1982), Aaker (1997). Therefore, a greater understanding of what the brand personifies, or should personify, helps a brand develop a better connect with its potential audience.

The Brand Personality scale is an attempt to systematically identify the dimensions that define brand characteristics, across various product categories. Using the scale, marketers can have a better comprehension of the symbolic nature of brands and also appreciate the details of how consumers buy brands for self-expressive purposes, Jennifer Aaker (1997). Starting with a universe of 309 traits, 5 final dimensions were arrived at, representing concepts of Sincerity, Excitement, Competence, Sophistication and Ruggedness.

To apply the concept of brand personality as an important tool for modern brand management, marketing researchers and marketers are in need of a reliable and valid measurement instrument. Brand Personality scales have been applied in multiple contexts to understand how customers perceive brands and also compare competitive brands. An understanding of the brand personality is also a critical ingredient of the brand communication strategy with regard to a new target audience or a product repositioning plan.

Brand Personality framework also have a huge implication in different cultural contexts, and the scale enables a deeper appreciation for the same.

It is widely acknowledged that “most of the research papers on brand personality are now based on Aaker's scale”, Azoulay and Kapferer (2003). However, the scale has its limitations with regard to the various aspects of personality it accounts for. For instance, the identified dimensions do not see universal applicability across all kinds of industries. The gender aspect has been found missing. The scale does not replicate well in other countries and consumer samples. Research has shown that the brand personality scale is sensitive to the cultural context in which it is used. Several studies have attempted to adapt the entire scale or parts of it to countries outside the US (e.g. Ferrandi et al, 2000; Aaker et al, 2001; Smit et al, 2002; and Chandon, 2003). Applying standardized brand personality scales to single brands or specific product categories required rigorous scale testing, since the scale validity might be in question.

SERVQUAL

Service quality is an abstract and elusive construct because of three features unique to services – intangibility, heterogeneity and inseparability of production and consumption, Parasuraman, Zeithaml and Berry (1985). Quality, however, is measured as a consumer’s judgment of an entity’s overall excellence, or perceived quality, Zeithaml, (1987), which is different from but related to the construct of satisfaction arising out of the use of a product or service experience. Perceived quality is an indicator of the discrepancy between consumer’s expectations and perceptions after having gone through a service experience. A consumer would rate a service quality as high or good, if his perceptions of service performance meet or exceed his expectations of what the service provider should provide.

Based on exploratory research on the elements that consumers use to assess quality, using detailed interviews and focus group discussions, Parasuraman et al (1985) identified ten determinants of service quality. Adopting Churchill’s approach to scale development, five final dimensions of construct were derived – tangibles, reliability, responsiveness, assurance and empathy – and a 22-item SERVQUAL scale was created. SERVQUAL offers a multiple item measure that enables organizations to understand what expectations its customers have from its services, and how they perceive the services offered to them. This also provides a huge opportunity for organizations to improve the service quality in line with the expectations. This application and measurement is even more pronounced in a competitive market – where competition is a big factor that drives organizations to offer better service quality and build a stronger bond and stickiness for the customers.

SERVQUAL has seen a wide range of applications. Among others, it has been used in different service situations, such as professional services, Freeman & Dart, (1993), tourism, Tribe & Snaith, (1998), information systems, Kettinger & Lee, (1994), health care, Lam, (1997), and hotel industry, Hessamaldin Mahdavinia Seyed, (2008). Being a statistically valid instrument owing to extensive field testing and refinement, it has been the most generic and universally-applicable. However, the scale has also had its share of criticism – including a debate on whether it represents the perfect way of conceptualizing the construct of service quality and whether the parameters used in SERVQUAL do justice to measuring quality. Further, applicability of SERVQUAL in different industries has been questioned, since the parameters might not be as suitable. The use of difference scores in calculations further contributes to potential problems with reliability and validity of the measure. Other elements such as cultural nuances impact consumer expectations of service quality and also their expectations on each of the dimensions of service quality, Donthu and Yoo (1998). Further, Kang & James (2004) have argued the SERVQUAL measurement does not adequately explain a technical attribute of service, since it focuses more on the service delivery process.

Although a very useful analysis perspective for the service or quality manager, SERVQUAL by itself, does not provide a complete picture of needs, expectations and perceptions in a service organization context. As Gaster (1995) comments, "because service provision is complex, it is not simply a matter of meeting expressed needs, but of finding out unexpressed needs, setting priorities, allocating resources and publicly justifying and accounting for what has been done".

DAGMAR

Defining Advertising Goals for Measured Advertising Results, abbreviated DAGMAR, is a model for setting advertising objectives and measuring the results thereof. Proposed by Russell Colley (1961), the DAGMAR approach proposes carrying a consumer through four levels of understanding through advertising. that the ultimate objective of advertising must carry a consumer through four levels of understanding: from Unawareness to Awareness—the consumer must first be aware of a brand or company Comprehension—he or she must have a comprehension of what the product is and its benefits; Conviction—he or she must arrive at the mental disposition or conviction to buy the brand; Action—finally, he or she actually buy that product.

The underpinning basis of this model is that the effect of communication forms the logical basis for advertising goals and objective against which the degree of success should be measured. Under the DAGMAR approach, an advertising goal involves a communication task that is specific and measurable. In fact, the principal contribution of the DAGMAR model is in acknowledging that the effectiveness of advertising can only be validly assessed where specified criteria for judging effectiveness are derived from explicitly stated advertising objectives.

The DAGMAR approach has had significant visibility and influence, and considerable impact on the advertising industry - specifically with regard to advertising planning process. Experts apply this model as the basis for defining objectives and also assessing the effectiveness of their campaigns. This also helps bring in greater objectivity in the overall definition of the expectations, and measurements thereof. The four stages defined by Colley enable the advertiser to plan and position a specific campaign for a specific result, therefore also making the messaging task simple and explicit.

However, despite its widespread adoption, DAGMAR has not been completely accepted by all advertisers – a major criticism being its reliance on the hierarchy of effects model. Consumers do not always go through this sequence of effects - as has been widely proven – and their response depends on a specific buying situation. Given the time and effort that goes into implementation of the model, many critics argue that DAGMAR is practical only for large companies with big advertising budgets. Further, purists believe in a sales goal, since the ultimate objective of advertising is to increase sales and grow the business. The DAGMAR model leaves the sales goal out of the picture and assesses the communication objective – and is hence seen as incomplete or insufficient. Another criticism against the model is that it inhibits advertising creativity by imposing too much structure and quantitative measures.

The SOCO Scale for Customer Orientation of Sales people

Customer-oriented selling refers to the degree to which salespeople practice the marketing concept by trying to help their customers make purchase decisions that will satisfy customer needs. Highly customer-oriented salespeople engage in behaviours aimed at increasing long-term customer satisfaction. Developed by Robert Saxe and Barton A. Weitz (1982), the SOCO scale tries to measure this degree of customer orientation in sales people. Following the scale development guidelines recommended by Nunnally (1978) and Churchill (1979), a pool of 104 items representing seven categories of characteristics was compiled to capture the attitudes and behaviours that distinguished high and low customer-oriented salespeople. A 24-item scale was finally created, which confirmed to all reliability and validity tests.

This twenty-four item scale has been used in a number of studies. Several authors have suggested a variety of modifications to the scale largely to adapt the scale to specific situations or markets or if some items may be inappropriate rather than as attempts to further refine the scale.

Various studies and applications of the scale have supported its dimensionality and reliability of the SOCO scale and its ability to measure the customer orientation of salespeople, from either a salesperson or a customer perspective. Some of these have used modified versions of the SOCO scale to adapt to the buyer-seller market situation, but all can be easily identified as variants of the original scale. However, if the SOCO scale is to be used to examine interrelationships with other constructs that have multiple-item scales, questionnaire length can become an issue, Maria M. Ryan (2001).

Issues in Scale Development

Scale proliferation and issues in measurement of a single construct across multiple definitions have already been mentioned. Here we bring out some issues in scale development, and how they impact the measure of the construct.

Construct definition

Multiple definitions exist in marketing literature for the same subject or phenomena, and often these are not interlinked or studied to bring one common perspective. With the result, the same subject has different interpretations, and ramifications, and a variety of measures estimating various aspects. Almost everyone has his own preferred measure and seems to blithely and naively assume that findings from one investigation can easily be compared and integrated with findings from investigations, which use other definitions, Jacob Jacoby (1978). Any decision based on a scale or measure which defines the subject in a sense different from the perspective at hand is bound to be either skewed or out of context, or both.

Methodology applied

Multiple approaches have been suggested by researchers, on how best to create a valid and reliable measure. Methodologies suggested by Nunnally (1967), Churchill (1979), and Rossiter (2002), among others, have been considerably popular. While most of these present a mechanism to develop a reliable and robust measurement technique, each of them also have their own process limitations, which if not accounted for adequately, will lead to an imbalanced measure.

Samples

Most scale development and creation is on the basis of sample data that is gathered by bringing in a representative sample of the actual population. In many cases, however, the sample selected is neither a truly representative sample, nor the best suited to address the construct or its implications. Most published literature does little to explain the sample details and how qualified the sample was to contribute to the development of the scale in question.

Student samples

The correctness of a scale is oftentimes in question, since many scholars have used student population as a sample for various studies leading to scale development. The student community, though often willing, supportive and helpful in any such process of high academic relevance, is not the best candidate for creating scales for various marketing concepts, say for prices or brand positioning. The student population is not always as informed or a decision maker in many such real-life decisions, and therefore, represents a highly skewed and tunnelled impression of that construct. Even if scales developed on such information are found to be valid and reliable on statistical counts, their logical validity leaves much to be accounted for.

Interviewer and Respondent bias

The interview process, by default, is inherently an artificial way of getting consumer or user information. A respondent is asked, in an unnatural setting, to respond to a set of queries which might not be top of the mind for him/ her, or even a priority. There might be an incentive or motivation to respond, but people are highly likely to respond in a ‘what should be’ manner rather than ‘what is’. The process itself builds in bias into the data and information collected, and using this as a base for future decision making might not always be the best approach to a subject.

Validity

Poor or incorrect sample selection leads to an obvious conclusion – scale validity. Because of a poor sample or incorrect approach to scale creation, often validity is not questioned. The scales are taken on face value and various aspects of validity, such as construct, predictive, cross and convergent validity, are assumed to exist, without a proper check.

The single measure

Marketing concepts have always been difficult to measure. Factors such as context, culture, economic environment, dependence on the respondent's frame of mind and many others have made it a challenge to create measures and scales for rather abstract phenomena and characteristics such as personality, positioning, image, quality etc. Given this background, an attempt to define and create a measure is a big feat – and many scholars have taken the plunge to take on such a tough task. Since they have created a measure, and it's the only one that seems to make sense, it tends to become a popular means to understand that specific construct. As much as there are instances of scale proliferation on many concepts, there are also cases where there is only a single scale, and no one has attempted to question it or offer an alternative. Being the only one, then, becomes a reason for being popular, accepted and used, despite any inherent flaws or limitations.

Culturally skewed representation

Most initial research on various aspects of marketing, over the past few decades, has addressed marketing constructs from a western audience perspective. The scholars, and the sample population they use for assessment of a concept, have been largely North American or European. There is relatively limited replication of these measurements in non-western environments and/or developing and less developed countries. This creates an inherent research gap in the determination of applicability of these measures in other geographies.

Scale adaptation

In the marketing discipline, various scales have been developed and have been constantly modified and adapted for different uses over time, Bearden and Netemeyer (1999). As an example, Finn and Kayande (2004) provide a detailed discussion on the alternative approaches and consequences of scale modification in marketing using the Parasuraman, Zeithaml and Berry's (1988) 22 item SERVQUAL scale. Marketing scales are often modified and adapted for use in different research scenarios. However this approach has often been criticized from a validity perspective as scales have been developed to measure a specific object of interest (Gerbing and Anderson 1988).

This adaptation approach entails researchers adapting established and validated marketing scales from ‘western’ markets for use globally. Scale adaptation would involve addition or deletion of items in scales which are considered to be irrelevant to specific market environments. Scale adaptation would allow researchers to draw on some theoretically grounded constructs that have been used in research, and this takes into account evidence of the universality of some marketing constructs which can be applied to different markets (Deshpande and Farley 2004). However, the question of whether modified scales actually measure what they are intended for in a new study or whether in fact they actually measure objects of interest which they were original designed for remains a key question that researchers have to ascertain in adapting scales thereby undermining the reliability of adapted scales (Finn and Kayande, 2004).

Creating a mathematical equation

Once the scales were studied and the research work on them reviewed, it was time to get in touch with expert practitioners and check for their opinion and feedback on various usage related elements of these chosen scales.

The research methodology applied to arrive at an interpretation of the on-the-ground application of these high impact scales included extensive literature review and discussions with experts and practitioners, who use these scales for quantitative analysis and decision making.

For the latter, the sampling technique employed was Judgment Sampling wherein experts working in the marketing and consulting field were identified so that they were familiar with these scales and models and were in a position to comment on their utility and usage. A total of 31 professionals were interviewed and their opinions on these scales were sought.

Critical attributes of scales are the ones that pertain to its robustness, universal usability and applicability and statistical validity of the scale. Research elaborates on all these elements of these selected scales, albeit every academic writer has his/her own opinion, perspective and approach to understanding and applying the scale in question. The authors have attempted to interpret the academic perspectives on each of these scales on each of these critical attributes to help establish a guide for their analysis and evaluation.

Table IV: Scale Rating based on Literature

Scale\Attribute	Utility	Validity	Reliability	Predictability	Universality
MARKOR	Medium	Medium	Low	Low	Low
VALS	High	Medium	Medium	Medium	Low
Brand Personality	High	Low	Low	Medium	Low
SERVQUAL	High	Medium	Medium	Medium	Medium
DAGMAR	High	Medium	Medium	High	Medium
SOCO	High	High	High	Medium	Medium

As mentioned above, 31 professionals were reached out to, in order to get a practitioner's feedback on the utility of these scales. Among these professionals, there was adequate knowledge of, and utilization of each of these scales.

Each one of them was given a list of these scales, along with a brief description of the actual scale, and asked to rate them on a scale of 1 to 5, 1 representing 'high' and 5 representing 'low'. In the final representation below, median scores for each of the scales is mentioned.

Table V: Scale Rating based on Expert Opinion

Scale\Attribute	Utility	Validity	Reliability	Predictability	Universality	Impact
MARKOR	Medium	Medium	Low	Low	Low	Low
VALS	High	Medium	Medium	Medium	Low	High

Brand Personality	High	Low	Low	Low	Low	Low
SERVQUAL	High	Medium	Medium	Medium	Medium	High
DAGMAR	High	Medium	Medium	High	Medium	High
SOCO	Medium	High	High	Medium	Medium	Low

As can be seen, these ratings are largely in sync with the academic interpretations, albeit with few deviations.

A Discriminant Analysis was conducted to distinguish high impact scales from low impact ones. The predictor variables were utility, validity, reliability, universality and predictability.

Selected output from the analysis using SPSS is outlined here as under.

Table VI: Decision process for identifying appropriate scales

		Utility	Validity	Reliability	Predictability	Universality
Covariance	Utility	.375	.125	.000	-.125	-.125
	Validity	.125	1.188	.875	.500	.375
	Reliability	.000	.875	.750	.250	.250
	Predictability	-.125	.500	.250	.625	.375
	Universality	-.125	.375	.250	.375	1.375

a. The covariance matrix has 4 degrees of freedom.

Table VII: Eigen Values

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	3.872[a]	100.0	100.0	.891

a. First 1 canonical discriminant functions were used in the analysis.

An eigen value indicates the proportion of variance explained. (Between-groups sums of squares divided by within-groups sums of squares). A large eigen value is associated with a strong function.

The canonical relation is a correlation between the discriminant scores and the levels of the dependent variable. A high correlation indicates a function that discriminates well. The present correlation of 0.891 is reasonably high (1.00 is perfect).

Table VIII: Wilk's Lambda

Test of Functi on(s)	Wilks' Lambda	Chi-square	df	Sig.
1	.205	3.167	4	.0530

Table IX: Standardized Canonical Discriminant Function Coefficients

	Function
	1
Utility	.949
Validity	.237
Reliability	-.439
Universality	.204

The 'Canonical Discriminant Function Coefficients' indicate the unstandardized scores concerning the independent variables. It is the list of coefficients of the unstandardized discriminant equation. Each subject's discriminant score would be computed by entering his or her variable values (raw data) for each of the variables in the equation.

We now attempt to use the equation we have derived to check how the values pan out for each of the chosen scales, and how these compare with the literature review.

Note that to arrive at the discriminant equation, we have used only the two most impactful variables. Generally, just like factor loadings, 0.30 is seen as the cut-off between important and less important variables.

$D = \alpha + \beta 1\, F1 + \beta 2\, F2 + \beta 3\, F3$

Where β represents the canonical coefficients and F represents the independent variable. Applying the values, we this get

D = (0.949 X Utility) – (0.439 X Reliability)

The discriminant function coefficients indicate the partial contribution of each variable to the discriminate function controlling for all other variables in the equation. They can be used to assess each factor's unique contribution to the discriminate function and therefore provide information on the relative importance of each variable.

It is important to also note that the positive or negative values of the coefficients are arbitrary and do not necessarily indicate that there is a positive or negative correlation between the independent variables and dependent function.

As we can see here, Utility has the maximum effect on the assessment of the scale impact, followed by Reliability on the dependent variable that determines whether a scale is considered high or low impact by practitioners.

Using the centroid values, we can determine a cut off value, such that all discriminant values above and below that categorize the scales into specific group. The values are thus:

Cut-off value = Average of the centroid values = (-1.036+2.282) / 2 = 0.623.

All discriminant values below 0.623 would therefore, correspond to the value 1 on the evaluation, which implies a high impact scale, and values above 0.623 would correspond to the value 5, which would mean that the scale is a low impact one.

Table X: Calculation of the Discriminant Value for various Scales

Scale	D value	D value interpretation for scale impact	Primary Data Classification of scale impact
MARKOR	1.091	Low	Low
VALS	-0.368	High	High
Brand Personality	0.142	High	Low
SERVQUAL	0.581	High	High
DAGMAR	0.581	High	High
SOCO	1.969	Low	Low

The calculated discriminant values, therefore, are in sync with the practitioner's perspectives on these scales, in all but one cases. The distinction in the case of the brand personality scale could be attributed to its high level of utility (although it scores low on all other aspects), that was specified by most respondents, and utility being the most important element of the discriminant determinant.

The discriminant value can be interpreted from a practitioner's perspective as really a derivative of how useful the scale is for his analysis purposes – that is a clear driver for the user of the scale in his estimation and decision making abilities and is therefore, a huge factor in the classification of scales. Some highly cited scales might not have high utility in today's context, or their usefulness quotient in terms of decision making for practical purposes may be low, which explains why they might be classified as low impact scales by expert practitioners.

Appropriate Scale Selection

Basis the above calculation, the authors propose a decision process to help identify appropriate scale for a given construct, or the creation of a new one for a given measurement situation. This would help both scale developers and users of scale to classify and utilize their scales.

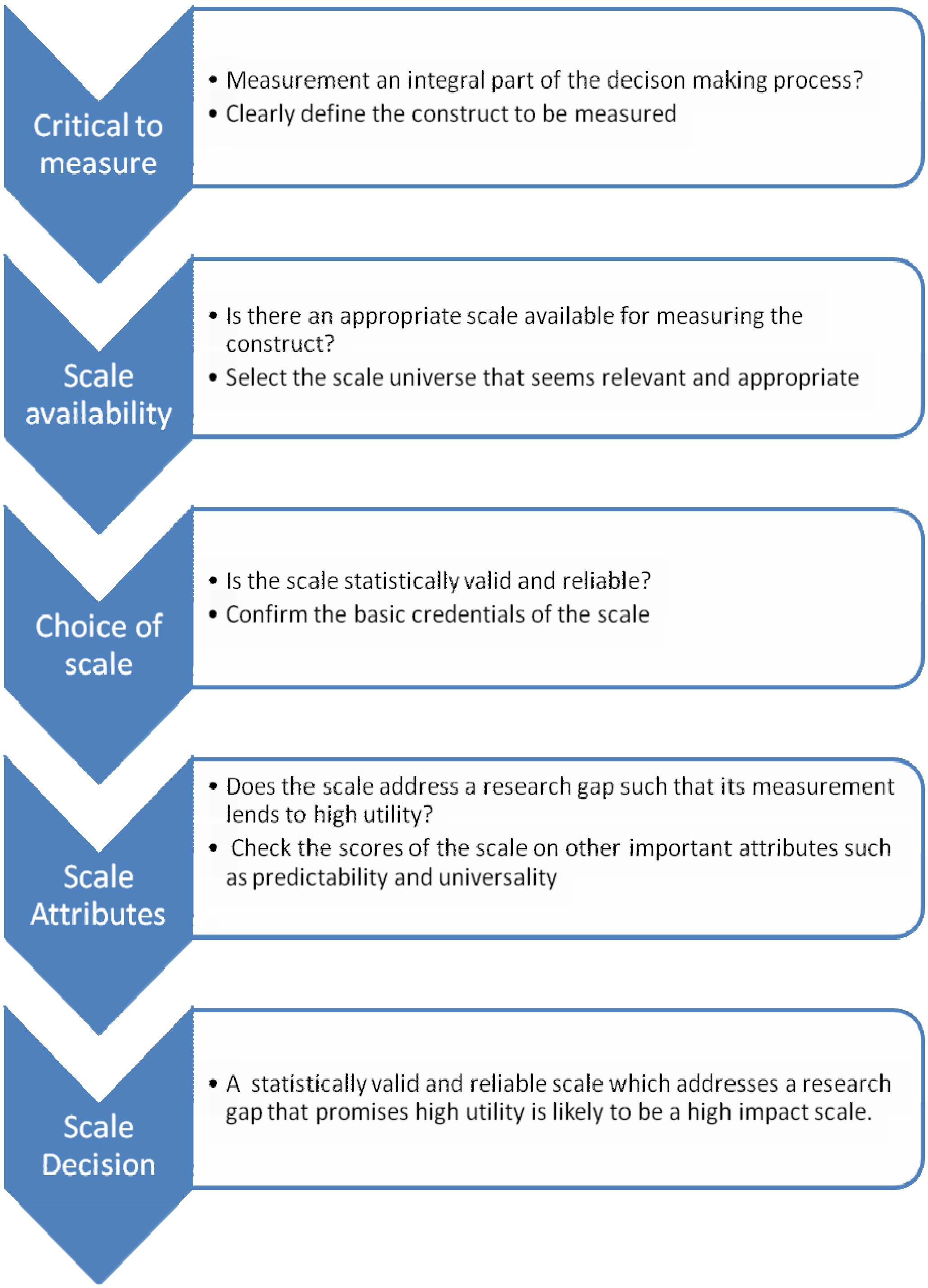

Figure I: Decision process for identifying appropriate scales

Through this analysis, we have thus attempted to highlight the critical attributes of important scales and how they are perceived to be ranked on each of these attributes by literary experts and researchers, as well as expert practitioners.

It is clear that the Utility of a scale is seen as the most critical parameter that determines its impact in the practitioner's world. However, literature suggests that Utility is not the prime driver of developing a scale – in fact Validity and Reliability are much more critical components while designing and verifying the importance of scales in marketing.

Conclusion

Having studied literature on scale creation pertaining to high impact and most widely popular scales in terms of their practical application, this study has been an attempt to highlight issues in scale development and application. The key findings have been outlined below.

In many instances, a scale is created with multiple interpretations of the construct, inadequate understanding of the scale creation approach and its fit in the given context, improper filtering to narrow down the sample, unnatural setting to get responses from the sample and use of statistics to prove an assumption, irrespective of whether the choice of statistical tools is correct or adequate. The biggest limitation, however, is the fact that a scale is created in a context, and applied in a very different setting. The dynamic nature of the factors that impact marketing decision making, render the application of the same scales to different situations a rather redundant exercise.

Scale interpretation, and application, then, is probably the only way of proving that a scale is truly representative of a construct. True validation is derived from actual proof of usage, and predictability, more than anything else. For instance, approaches such as those suggested by SERVQUAL have shown real application, and real results on the ground, and therefore have real validity in a variety of marketing situations, though universal applicability is still not promised. However, the same high level of standardized applicability is not true of many other scales, models and approaches presented in marketing literature.

What the scales do, instead, is provide a guidance, direction or approach to how a specific phenomenon can be understood in a given situational context. Taken in that sense, a scale offers a structured and organized method to evaluate a process, construct or behavioural parameter, thus enabling a common understanding across multiple potential. If scale application is limited to its usage as outlined here, scales can really serve their actual intent.

In summation:

1. Scales offer a critical direction and guideline to every construct
2. Scale development, however, has inherent problems, that get transferred to the actual measure created and therefore its practical applications
3. Critical attributes of scales pertain to its robustness, statistical validity and universal usability and applicability
4. Many practitioners use the scales as guidelines but change the actual scale items to suit their specific context. This is true even for the most popular and highly academically cited scales.

The authors have tried to present the critical attributes of important scales and score the scale on each one of them – thus providing a baseline reference for understanding, appreciating and applying each of these scales in a future research or organizational analysis situation.

We have also presented a simple equation that relates the important attributes of scales and explains on the basis of these attributes if the scale would be a high impact or a low impact one.

Limitations and Future Research

This study aims to bring out salient elements of a few highly cited scales in marketing. The intention is to highlight various aspects of the scale applicability and relevance in the dynamic context of ever changing marketing ethos. One clear limitation, however, is the limited universe of scales that has been studied. The selection of these scales has been primarily on the basis of various aspects of the field of marketing – with an attempt to cover different marketing principles. At the same time, the effort was to find measures which have been most popular and most prominently cited by academic and practical applications. The choice of scales, if altered, could have lent a larger perspective to this study.

Based on actual data of scale application and accuracy for the subject it intends to measure, one can possibly draw up a Scale Quadrant which can categorize scales with regard to their strength, usage and other parameters. Such a representation can add substantially to the understanding of a scale and its interpretation, as well as applicability for specific measurement situations.

All parameters that characterize a scale application in a context are critical for its evaluation and for understanding its real value to the knowledge of the subject. For instance, Utility and Universality are the two attributes most apt in capturing how useful a scale or model is in actual practical scenarios. On the other hand, Reliability and Validity underpin the core strengths of the scale in providing a measure for what it intends to be studying.

The proposed Scale Quadrant can plot a scale's perceived levels on these attributes to help understand which scales are credible benchmarks in marketing literature. Any new scale development effort then would aim to emulate these benchmarks with respect to scale definition and creation.

A representation of this type would provide a context to the usage quotient of a scale – it would make it easier to understand the degree to which a scale meets critical requirements, including but not limited to statistical measures of validity. A greater appreciation of the same can possibly be drawn if one could present a multi-dimensional representation which captures various factors along each axis and uses a spatial representation to enable assessment of the scale in question.

Development of such a Scale Quadrant across various dimensions could be an interesting future research subject for students of the science of measurements in marketing.

Some of the scales we are applying in today's studies have been the ones developed 25-30 years ago. While their fundamental logic and construct validity holds, especially for some of the high impact universal scales, these scales fail to capture the evolution and dynamic changes that have happened in business, marketing and even the way the customer or the brand is perceived today. What this really means is that though the measure is valid and applicable, it does not do justice to various new aspects of the marketing function that have come into being in the years after the scale was established. In a few cases some scales have seen random efforts of modification or embedding the new ideas such as those presented by the integrated marketing communication philosophy. Some new scales have also emerged to capture the constructs of newer disciplines such as those of digital marketing or the social media phenomena. However, the elements covered in the new scales do not get mention or adequate attention in some of the older measures which might not have seen a comprehensive revisiting or a complete redevelopment in keeping with the emerging new trends.

In this regard, one can possibly draw a parallel with some established chronological trend patterns and define a concept of a Scale Cycle. The Scale Cycle would represent its valid lifetime after which it needs a revisit to ensure that dynamic environmental or evolution of the function gets adequate mention in the scale items and measures. A 5 or 7-year business duration may in many ways seem the most logical and appropriate. A scale being used say 7 years after it was first introduced should necessarily be revalidated with adequate and appropriate interventions of any new measures or phenomena that might have an impact on the fundamental construct in the new context.

However, what would be the true validity time period for a given scale or what kind of changes would trigger a revisit of a developed and popular scale are subjective topics in themselves. Drawing these specifically would need greater thought and definite research of a scale usage versus a time period study.

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