Technical University of Varna Annual Journal
https://doi.org/10.29114/ajtuv.vol8.iss2.321
Vol.8 Issue 2 (2024)
Published: 2024-12-31
ISSN 2603-316X (Online)

Scaling in Quantitative Survey in Management Science Research: The Perspective of Likert Scale

Ayobami Elegunde, *Olajide* Okunbanjo, and *Babatunde* Afolabi

1 – Department of Business Administration, Faculty of Management Sciences, Lagos State University, Ojo

Corresponding author contact: olajide.okunbanjo@lasu.edu.ng.

Abstract. *The research process entails the collection of data through questionnaire providing a ranking scale platform for measuring the respondents' responses. Thus, this paper explores the topic of scaling in quantitative survey research in the field of management science, with a focus on Likert scaling. The paper delves into the types of scaling discussed in the literature, incorporating classical test theory as well as item response theory as guiding frameworks for its objectives. Employing a qualitative research approach, the paper allows for the use of contextual analysis through Qualitative Data Analysis (QDA). Presented is an overview of the various types of Likert scaling including 2-point, 3-point, 4-point, 5- point, 6-point, 7-point, 9-point, and beyond. The paper also argues that the 6-point Likert scale is the most appropriate scaling method for management science research as it divides the neutral option (mid-point) issue into parts of agreement and disagreement. The study recommends that management science researchers should familiarize themselves with the different types of Likert scale in order to determine the most appropriate for their studies. The paper suggests that the 6-point Likert scale is particularly relevant for studies within the management sciences field.*

Keywords: 6-point Likert scaling, Likert scale, scaling, survey research, management sciences

1 Introduction

The complexity of human nature poses serious challenges to the task of measuring human attitudes, as it can be both cumbersome and subjective. Analyzing the responses of individuals within a given organization, therefore, calls for the management sciences to study human attitudes through research processes. Research process enables organizational problems or challenges to be identified and solved. methodology serves as the heart of every research process across the globe. Methodology outlines the approaches and processes the researchers intend to employ in order to achieve the objectives of their study. In management sciences, the centered is on human behaviour and it covers two major aspects of research which are quantitative and qualitative research. Both approaches require the use of data collection, which could include time series data or survey data. In view of this, the present paper focuses specifically on the survey quantitative research, as it pertains to the management and employee behaviours within the field of management sciences.

Survey research implies gathering the opinions of individuals who act as respondents on a particular subject of interest (Tanujaya, Prahmana & Mumu, 2022). Louangrath and Sutanapong (2018) emphasize that survey research is about the opinions of respondents and necessitates psychometrics (psychological measurement). According to Subedi (2016), psychological measurement could take the form of multiple-choice questions or dichotomous answers for respondents to select, representing scaling. Thus, scaling in survey research plays a crucial role in management sciences research.

Scaling serves as the medium of communication between researchers and respondents (Subedi, 2016; Royal, Ellis, Ensslen & Homan, 2010; Lopez, 1996). Scaling enables the respondents to clearly identify the appropriate responses for items in the research instrument as well as the ordered nature of potential responses (Alhassan, Asiamah, Opuni & Alhassan, 2022). Scaling also helps to distinguish between different options presented by the researchers (Benidiktus, Rully & Jeinne, 2022). Scaling is designed by the researcher to suit the nature of the research, subject of interest and the nature of the respondents. It shows how the respondents will express their responses on the subject matter or subject of interest towards achieving the research objectives. If scaling is misused, the intended purpose of a research study may be compromised.

Technical University of Varna Annual Journal
https://doi.org/10.29114/ajtuv.vol8.iss2.321
Vol.8 Issue 2 (2024)
Published: 2024-12-31
ISSN 2603-316X (Online)

Nordi (2006) mentioned that scaling is what a researcher uses to measure the intensity of the respondents' opinions or perceptions on both dependent and independent variable(s). This is further elaborated by Royal et al (2010), who noted that scaling is more popular or common with structured questionnaire that restricts the opinions or responses of the respondents to guide respondents towards desired responses. Menold and Bogner (2016) added that scaling may be useful in a semi-structured questionnaire for researchers in management sciences.

Research, as far as management sciences is concerned, is a systematic process of identifying and solving organisational issues, challenges and problems. Scaling, as part of the research process, creates challenges for management sciences researchers particularly in determining the appropriateness of the scale to be adopted. The collection of data necessitates the consideration of various respondent emotions, further complicating the process of scaling for management sciences researchers. Potoglou, Burge, Flynn, Netten, Malley, Forder, and Brazier (2011) posited that researchers seem to be confused on selecting the right scaling method for their studies, leading to errors such as mismatched scaling choices that are not in line with the research problem or research objectives.

Available evidence points to the use of various scaling techniques such as discrete choice experiment, dichotomous scaling, trichotomous scaling, and Likert scaling in research studies targeting the same group of respondents. This shows that there are different scaling for researchers, including those in the field of management sciences, and highlights the importance of identifying the appropriate scaling method to align with the purpose of the research study. Taherdoost (2022) stated that researchers tend to combine rating scaling and indexes together when attempting to collect data from the respondents taking no consideration of the objectives of the study, the nature of the respondents and the identified problem to be solved. Subedi (2016) elaborated on the wrong use of scaling that leads to inappropriate achievement of research aims and/or objectives in management sciences. Improper use of scaling, especially the Likert scaling, creates a challenge of midpoint issue for analysis (McLeod, 2019). The point numbers enable the researchers or data analysts to quantify the responses of the respondents that could be subjective in nature as objective (McLeod 2019; Subedi, 2016; Joshi, Kale, Chandel, & Pal, 2015).

According to Tanujaya et al (2022), scaling determines the method of data analysis either parametric or non-parametric that will be appropriate and yet this consideration is often overlooked in management science researches. Subedi (2016) also points out that poor likert scaling affects the reliability of the variables employed by researchers to address identified problems, especially when likert type scaling is involved. Likert scale type of scaling is being adopted when a non-likert type scaling ought to have been used and vice versa, which as reported by (Chyung, Swanson, Roberts & Hankinson, 2018; Louangrath & Sutanapong (2018) and this seems to collect inaccurate or incomplete responses from the respondents. Louangrath and Sutanapong (2018) opined that one of the challenges of inappropriate scaling when coding responses from respondents to identified problems is the absence of 0 point. For the purposes of hypothesis testing, this restricts the data to a continuous distribution. Tanujaya et al. (2022) noted the issue of the midpoint problem in likert scaling. The term used for the midpoint in likert scaling can be interpreted differently by individual respondents in a given study. It is believed that undecided, maybe, indifferent and neutral choice of words in scaling do not carry the same implications for the respondents (Chyung et al., 2018). Thus, it is important to explore the different types of scaling for management sciences researchers and ensure the appropriateness of the scaling to the subject of interest. The main objective of the paper is to explore scaling in quantitative survey research within the field of management sciences, with a specific focus on Likert scales. Specifically, the study intends to:

i. explore the different types of likert scaling for management sciences researchers
ii. provide appropriate Likert scaling techniques for management sciences research

2 Literature Review

2.1 Conceptual Review

2.1.1 Scaling

Scaling, as described by Taherdoost (2022), is the aspect of measurement that deals with the construction of research instruments to link constructs that are qualitative in nature with quantitative metrics. Taherdoost (2016) sees scaling as the act of assigning numerical values to objects for the purposes of attaining research objectives. Scaling could be seen as a platform created by researchers to determine

Technical University of Varna Annual Journal
https://doi.org/10.29114/ajtuv.vol8.iss2.321
Vol.8 Issue 2 (2024)
Published: 2024-12-31
ISSN 2603-316X (Online)

respondents' responses in a research instrument. It could be seen as a measurement extension that is about the creation of a timeline that measurements of an object will be based upon. Scaling is to give of respondents' responses a structure. According to Zelazny, Williams and Bernstein (2019), scaling determines how well the responses hang together and aids in the reliability of data for a research study, especially in the construct reliability. It is evident that there are diverse types scaling techniques available for researchers to adopt.

Various types of scaling have been seen differently by scholars. Some of the most commonly recognized types include Likert scale and non-Likert scale (Chyung et al., 2018; Louangrath & Sutanapong, 2018). Additionally, Taherdoost (2022) categorizes the types of scaling as Thurstone scaling, Gutmann scaling, and Likert scaling. Wu (2022) perceived the types of scaling are rating scaling and index scaling. Discrete choice experiment, dichotomous scaling, and likert scaling as well as best-worst scaling are among the types of scaling posited by Potoglu et al (2011). All in all, for the purposes of the present study, the focus will be on likert scaling not only due to its significance in describing others types of scaling but also Likert scaling is focused on because it is the most widely used scaling type in literature with its ease of understanding by respondents (Zelazny et al., 2019).

Thurstone Scaling: Thurstone scaling is the type of scaling that groups and arranges the responses of the respondents. It was invented by Robert Thurstone, a psychologist, who believed that respondents' responses should be divided into groups and equal importance should be assigned to each division before ranking them. According to Taherdoost (2022), Thurstone scaling involves a set of statements that serves as response options for respondents to select based on a distinct construct.

Each statement that serves as options is tagged with a numerical value in accordance to its importance or weight in relation to the measured construct or concept. Thurstone scaling has no specific options. It depends on what the researcher intends to achieve. It is a popular estimation of respondents' preferences in research instruments.

Guttmann Scaling: This scaling was developed by Louis Guttman in 1944. Guttmann scaling is also seen as a cumulative scaling. Abdi (2010) stated that it can also be called scalogram analysis. It is a type of scaling that allows for the use of previous responses on particular items in the questionnaire to determine the next response for subsequent item(s). Guttmann scaling is the scaling that involves hierarchy related questions which the respondents need to give a response. It is a set of options that are arranged in specific order. Its cumulative aspect is demonstrated by the arrangement of the range of choices for respondents to choose from (Corbetta, 2003).

Guttman scale contains a set of statements where agreement with one statement implies agreement with previous or preceding statements. In Taheerdost perspective (2022), this is seen as a scaling process where the inherent attribute remains consistent, demonstrating how the cumulative nature of the alternative response is mirrored in the previous one as well. Thus, subsequent answers stem from the previous responses. Key characteristics of Guttman scaling include a deterministic model (cumulativeness), involvement of reproducible questions (screening of undesirable responses), and the ordinal nature of data (arrangement from least important statements to statements of highest importance).

Likert Scaling: Likert scaling was invented by a psychologist called Rensis Likert. Likert scale is a psychometric scale used in survey research to measure respondents' attitudes (Benidiktus et al., 2022). This type of scaling covers the degree of respondents' feelings towards a specific set of items in a questionnaire (Tanujaya et al., 2022), also known as a summated rating scale (Taherdoost, 2017, 2022). According to Taheerdoost (2022), Likert scale is the most appropriate and common scaling type for management and social sciences because of its flexibility in offering various response options for respondents. As a psychometric scale, it is mostly adopted in different types of survey research studies (Krosnick, 2018).

The Likert scale is a type of scaling that is very quick, easy to understand and easily adopted for quantitative research surveys, especially in the field of management sciences. Menold and Bogner (2016) describe likert scaling as a scaling type that is summative in nature. It structures the respondents' responses in a particular range which could be in form of highest to lowest, or from fully agree to fully disagree (Acharya, 2010). The options for the respondents' responses could be structured horizontally or vertically. Lietz (2010) pointed out that likert scale could be either bipolar or unipolar. He further explained that in a bipolar nature of likert scale, responses range from -5 to +5 (strongly disagree to strongly agree), while in a unipolar scale, responses ranges from 0 to 20 (extremely satisfied to extremely

Technical University of Varna Annual Journal
https://doi.org/10.29114/ajtuv.vol8.iss2.321
Vol.8 Issue 2 (2024)
Published: 2024-12-31
ISSN 2603-316X (Online)

dissatisfied). Thus, likert scaling specifies the level of respondents' agreement or disagreement for a series of items or statements.

2.2 Theoretical Underpinning

2.2.1 Classical Test Theory (CTT)

Classical test theory was developed by Novick in 1966, and it was expanded by Lord and Novick in 1968; as well as Allen and Yen in 1979. The theory is a traditional psychometric theory because it shows the relationship between the status of items in the questionnaire and the respondents to the questionnaire. The end goal of this theory is to ensure reliability of measurements with scaling being a key determinant. The CTT relevance to this paper lies in its ability to demonstrate how respondents' choices on scale-based options affect the understandability of measurement items. Kilic, Koyuncu and Uysal (2023) argued that the theory is based on the assumption that one measurement is free of error because it is well-scaled, and if there is an error, it does not impact other measures in the research instrument. However, this theory is not applicable to regular scenarios, leading to the birth of Item Response Theory.

2.2.2 Item Response Theory (IRT)

Item response theory was pioneered by Lord, F.M. a psychometrician, Rasch, G., a mathematician and Lazarsfeld, P., a sociologist in the 1950s. Other proponents of the theory include Wright, B.D., Andrich, D., Wu, M. among others. IRT is an improvement and expansion of CTT, offering greater flexibility in scaling items for management and social sciences research (Andersson & Xin, 2018). The theory emphasizes the respondent's position in a rating scale that is continuum. The theory provides an explanation on what is being measured and its outcome is based on the respondents' responses (Reckase, 2009). IRT paves the way for multiple-choice items which ensures reliability and minimization of measurement error as posited by (Andersson & Xin, 2018) According to Kilic et al. (2023), item response theory takes into account the respondents' abilities, item characteristics such as difficulty and discrimination, by creating multiple choice options for respondents to ensure flexibility.

2.3 Review of Related Studies

Alhassan et al. (2022) explored the potential and the unknown of Likert scale. The paper argued that a unified Likert scale will resolve the conflicting functions of descriptive anchors and numerical labelling of the scale. Subedi (2016) explored the confusing issues as well as challenges in likert type of scaling, particularly focusing on the dilemma and issues regarding the midpoint of scale. The paper differentiated between likert items and likert scale and posited that likert scale preceeds likert item without any discernible difference between the two, and highlighting the issue of midpoint in Likert scales. Murray (2013) reported that parametric tests could be more appropriate for the analysis of scale data. These studies did not capture all other scaling types and the focus was not on management science research.

Chyung et al (2018) carried out a qualitative study on survey research design, focusing on continuous rating scales. The study developed a structured survey that would be suitable for discrete rating and continuous rating scales. The authors concluded that neither discrete nor continuous rating scales are inherently better than the other. Researchers are meant to select the type of scale that best aligns with the objectives of their studies. Bourdel, Alves, Pickering, Wall et al. (2017) probed into visual analog scaling and noted that it is commonly adopted among medical research studies. However, Voutilainen, Pitkäaho, Kvist and Vehviläinen-Julkunen (2015) found that visual analog scale is faster and quicker to use for scaling than other methods. Hilbert, Küchenhoff, Sarubin, Nakagawa and Bühner (2016) posited that significant differences do not exist among the types of scaling-dichotomous, likert scale and visual analog scale examined and suggested likert scale as they are easier for respondents to comprehend. All these studies, however, failed to emphasize the necessity of examining necessary why likert in the field of management sciences.

Louangrath and Sutanapong (2018) categorized scaling types into likert and non-likert and found that scale 0,1,2,3 is the most effective scale type for quantitative response choices. Tanujaya et al (2022) investigated scaling in social sciences, using the problems as well as the difficulties associated with likert scale. The paper performed a systematic review as well as content analysis to conclude that likert scaling is easy to develop because it has no requirements that are complicated. Saris and Gallhofer (2007); Menold, Kaczmirek, Lenzner, and Neusar (2014), found that fully verbalised response scales also increased cross-sectional reliability. Menold and Bogner (2016) reported that it is appropriate to adopt item-specific scales and to avoid indifferent option(s). Norman (2010) used real scale data to find that parametric tests is more appropriate than likert type of data. Despite the fact these studies reviewed

Technical University of Varna Annual Journal
https://doi.org/10.29114/ajtuv.vol8.iss2.321
Vol.8 Issue 2 (2024)
Published: 2024-12-31
ISSN 2603-316X (Online)

stressed on likert scale across various fields, none of them suggested the appropriate likert scaling type for the field of management sciences.

3 Methodology

This paper is a qualitative paper because it is not empirical. Qualitative research approach was employed The paper adopted explanatory research design so as to explain what is meant by scaling in a specific field of study which is management sciences and explore different types of likert scale. Thus, Qualitative Data Analysis (QDA) was employed because it aids in collecting, organising and interpreting non-numerical data on a subject of interest. However, the paper focused on contextual analysis as an element of QDA. Contextual analysis aids to break down the issues in the observed variable. Scaling as the observable in the paper is broken on its contextualisation. This is because of different elements in likert scaling as far as management sciences researchers are concerned. The paper is limited to likert scaling in management sciences research field. The paper is restricted to different forms of likert scale and to take a position on the likert scale that is more appropriate in the field management sciences research.

4 Discussion of Findings

Scaling is important for the ranking of respondents' opinions on a particular subject. Researchers have established a vast array of scaling formats in different fields of study. Royal et al (2020) indicated that scaling options cannot be strictly standardized in a research instrument. The scaling options, irrespective of the field of study do not adhere to a strict uniformity, and often vary greatly; for instance, a scaling options of dichotomous scale (Yes and No), trichomous scale (Yes, Maybe and No) and agree, neutral and disagree. All these belong to different types of scaling as pointed extensively discussed in the literature.

As noted by Taherdoost (2016), the most popular likert scaling points is 5 points- strongly agree (5), agree (4), undecided or neutral (3), disagree (2) and strongly disagree (1), which, in turn, poses a challenge due to the presence of a midpoint. Chyung et al (2017) raised concerns about the 5-point scale of likert scale suggesting that the midpoint allows respondents to remain indifferent in their responses. Chyung et al believed that respondents cannot truly be neutral when expressing their attitudes towards an organization and pointed that being neutral and undecided is not the same. For a respondent to be neutral in an attempt to solve a problem in a given organisation implies that the respondents lack basic understanding of the issue at hand. This does not align with the earlier views of (Choudhury & Bhattacharjee, 2014; Jamieson, 2004; Croasmun & Ostrom, 2011; Armstrong, 1987 Guy & Norvell, 1977).

Tanujaya et al (2022) mentioned that respondents should take a clear stance either in agreement or disagreement side. The scaling must not give room for neutrality or indifferent responses from the respondents. Being indifferent, neutral and/or undecided signifies that the respondents are disinterested in responding to the items under consideration and exhibits signs of weariness on the part of the respondents (Tanujaya et al., 2022; Chyung et al., 2017; Viljoen, 2015). Similarly, Diamantopoulos, Sarstedt, Fuchs, Wilczynski, and Kaiser (2012) believed that the likert scale should consist of at least four items so as to avoid a midpoint option. According to the authors, a 4-point likert scale, including options for strong agree, agree and disagree and strongly disagree is more appropriate as the it offers a detailed breakdown of the aspects of agreement and disagreement. This viewpoint is also supported by Williams, Burt, and Hilton (2016). Dolnicar and Grün (2007) adopted a more innovative approach in their attempts to address the midpoint issue. Proposed, thus, was a 6-point likert scale strongly agree, agree, partially agree, partially disagree, disagree, and strongly disagree, which is lacking in most literature in the field of management sciences research. With such a wider range of response options, it could be said that a compromise has been reached in settling the midpoint issue in survey research, especially in the fields of management and social sciences.

The proponents-Alhassan et al (2022), Simms, Zelazny, Williams, and Bernstein (2019), Lee and Paek (2014), Wakita, Ueshima, and Noguchi (2012), Dolnicar and Grün (2007), Vagias (2006) argued that a 6-point likert scale provides respondents with more clear options to express either agreement or disagreement. Leung (2011) Carifio and Perla (2007), Cohen, Manion, and Morrison (2000) advocated for the use of 7-point, 9-point, and 11-point likert scales. The authors are of the view that neutrality

Technical University of Varna Annual Journal
https://doi.org/10.29114/ajtuv.vol8.iss2.321
Vol.8 Issue 2 (2024)
Published: 2024-12-31
ISSN 2603-316X (Online)

should be eliminated in scaling. Yet, the inclusion of an odd number point scale paves way for respondents to select a midpoint or express indifference in the their responses. The 7-point scale covers options such as completely agree, agree, slightly agree, neutral, slightly disagree, generally disagree, and completely disagree. Studies by Joshi et al (2015), Luzano, Garcia-Cueto, and Muniz, (2008); Weng (2004) claimed that 7-point likert scaling is the best approach that can aid reliability and validity in research. Joshi et al (2015) noted that the 7-point scale offers a wider range of options and descriptive features. Similarly, Wu and Leung (2017), Leung (2011), Hodge and Gillespie (2007) observed that increasing the number of points can enhance reliability. Leung (2011) later added that a larger number of points contributes to better psychometric properties and ease of comprehension. However, Lee and Paek (2014), Wakita, Ueshima, and Noguchi (2012) claimed that using a high number of scaling points may lead to mental stress for the respondents, resulting in decreased response quality, inconsistent responses, and potential systematic errors. Simms, Zelazny, Williams, and Bernstein (2019) discovered that increasing the number of response alternatives beyond six did not yield any further benefits in psychometrics. The 6-point likert scaling serves as a pivotal middle scaling point across all patterns of likert scale.

The 6-point scale, as observed, serves as a middle ground among various patterns of Likert scaling and creates a balanced platform between agreement and disagreement, minimizing the risks associated with the options of neutrality and encouraging responses that are thoughtful, facilitating, thereby, statistical analyses, as pointed out by Simms et al (2019); Lee and Paek (2014), Wakita, Ueshima, and Noguchi (2012) as well as Dolnicar and Grün (2007). According to Alhassan et al (2022), the 6-pont likert scale forces respondents to choose between agreement or disagreement, resulting in better data collection. This is due to the fact that a neutral option was divided into “slightly agree” and “slightly disagree”. However, it is important to recognize that the likert scale is not limited to just agreement and disagreement. According to Vagias (2006), the likert scale should be tailored to the specific content or theme of the research variables. For instance, “strongly agree” to “strongly disagree” are options for the level of agreement, while “perfectly acceptable” to “perfectly unacceptable” are options for the level of acceptance; “absolutely appropriate” to “absolute inappropriate” are options for appropriateness of the variables, and “extremely satisfied” to “extremely dissatisfied” are options for the level of satisfaction and many others. Thus, irrespective of the theme of a research study variables in management science research, the 6-point likert scale creates a balance between the positive and negative scales of options, unlike the neutrality of the 5-point likert scale. In light of this, the 6-point likert scale could be seen as the most appropriate type of scale which is the standpoint of this study. A summary of the 6-point likert scale is presented in the table below:

Table 1: 6-point Likert Scale by Theme

Themes	Likert Scale	Point Scale
Degree of Agreement	Strongly Agree (6) Agree (5) Partially Agree (4) Partially Disagree (3) Disagree (2) Strongly Disagree (1)	6-point Likert scale
Degree of Importance	Extremely Importance (6) Very Importance (5) Moderately Importance (4) Slightly Importance (3) Low Importance (2) Not Importance (1)	6-point Likert scale
Degree of Appropriateness	Absolute Appropritate (6) Appropriate (5) Slightly Appropriate (4) Slightly Inappropriate(3) Inappropriate (2) AbsolutelyInappropriate (1)	6-point Likert scale
Degree of Satisfaction	Very Satisfied (6)	6-point Likert scale

Technical University of Varna Annual Journal
https://doi.org/10.29114/ajtuv.vol8.iss2.321
Vol.8 Issue 2 (2024)
Published: 2024-12-31
ISSN 2603-316X (Online)

	Satisfied (5) Fairly Satisfied (4) Fairly Dissatisfied (3) Dissatisfied (2) Very Dissatisfied (1)	
Degree of Acceptance	Perfectly Acceptable (6) Acceptable (5) Partially Acceptable (4) Partially Unacceptable (3) Unacceptable (2) Totally Unacceptable (1)	6-point Likert scale
Degree of Action	Always True (6) Usually True (5) Sometimes True (4) Sometimes Not True (3) Rarely True (2) Never True (1)	6-point Likert scale
Degree of Priority	Essential Priority (6) High Priority (5) Moderate Priority (4) Somewhat Priority (3) Low Priority (2) Not a Priority (1)	6-point Likert scale

Source: Adapted from Alhassan et al (2022); Vagias (2006)

Table 1 presents a selection of 6-point likert scale options that have been identified in the literature and can be adopted by researchers in the field of management sciences to address organisational identified problems. The table serves as evidence that the likert scale is not themed on only agreement and disagreement sides. It should be pointed that the structure of an item or items that measure a variable determines the elements of a 6-point likert scale. This implies that a 6-point likert scale that is suitable for one set of items may not be appropriate for another, depending on how the items are presented or structured in the research instrument. The objectives that a research or researcher wants to achieve could also determine the kind of the 6-point likert scale to be adopted. Similar observations can be made regarding the very formulation of the research questions. In essence, the fact that the degree of agreement is the most widely used 6-point likert scale in management sciences, does not automatically determine its appropriateness for all circumstances. The suitability of some of the elements within the 6-point likert scale demonstrated in the table below:

Table 2: Suitability of the 6-point Likert Scale by Theme

Variables	**Items**	**Appropriate 6-point Likert scale(s)**
Entrepreneurial Culture	My business does introduce new products in the market	Degree of Agreement Degree of Action
	Introduction of new product is needed for survival	Degree of Agreement Degree of Acceptance Degree of Priority Degree of Importance
Compressed Work	I am allowed to work for fewer hours in a day I can work for extra hours in order to cover up future working hours	Degree of Agreement Degree of Action

Technical University of Varna
Annual Journal
ISSN 2603-316X (Online)
https://doi.org/10.29114/ajtuv.vol8.iss2.321
Vol.8 Issue 2 (2024)
Published: 2024-12-31

Compensation	My pay commesurates with my efforts in my company The promotion exercise in my company is fair	Degree of Agreement Degree of Action Degree of Acceptance Degree of Satisfaction
Internal Response Orientation	Quick collective decisions Sensitivity to opportunity (ies)	Degree of Importance Degree of Priority

Table 2 illustrates the paper's perspective on the appropriateness of the different themes within a 6-point Likert scale. It is evident that the degree of agreement appears to be suitable for most items within a research instrument in as much as they are structured in a clause sentence format, as opposed to phrase sentences. Similarly, the degree of action aligns well with this structure. However, the degree of satisfaction seems more suitable for the results of an action or activity(ies), and this could be similar to the degree of acceptance, while the degree of priority correlates with the level of importance. Thus, the degree of agreement and degree of action are seen or observed to be embodied within the themes of the 6-point likert scale, highlighting its suitability, as observed in the studies Okunbanjo (2024); Onesti (2023); Khan, Rehmat and Butt (2020); Olajide and Okunbanjo (2020) in the field of management science research.

5 Conclusions

Scaling in research studies within the field of management sciences allows respondents to understand how their responses are ranked by the researcher(s). Likert scale, unlike other types of scaling, provides respondents with multiple-choice response options. In the literature, the inclusion of 3-point, 4-point, or 5-point scales, and beyond were not stipulated by the propounder of likert scale. This implies that Rensis Likert did not mentioned the specific category or numeric labels to be employed, but he did suggest the use of multiple-choice questions and numeric labels within the Likert type of scaling. In view of this argument, different multiple-choice response options were developed in the literature.

The paper posited that the different types of likert scale which include 2-point, 3-point, 4-point, 5-point, 6-point, and 7-point likert scales. Among these options, the paper argues that the 6-point likert scale is the most appropriate likert scale for management sciences research studies due to its alignment with the behaviours of individuals with organisations and the behaviours of the organisations themselves, which are central to the field of management sciences. In addition, the 6-point Likert scale eliminates the midpoint issue of neutrality.

The paper, therefore, recommends that management sciences researchers need to familiarize themselves with considerations such as midpoint and zero-point issues, as well as the possibility for respondents to feel pressured to choose a side when using different scaling options in each type of Likert scaling in order to adopt the appropriate Likert scaling type.

The paper recommends that management sciences researchers should consider adopting 6-point likert scale in their research studies that are relating to the field of management sciences.

The paper also encourages management science researchers to explore other likert scale options beyond those measuring degree of agreement options such as degree of acceptance, degree of appropriateness, degree of action, degree of satisfaction among others, especially the degree of action.

In summary, the adoption of 6-point likert scale should be based on the structure of the items in the research instrument being employed. The paper observes that the most popular elements of the 6-point Likert scale, especially in the field of management science research, are "strongly agree; agree; partially agree; partially disagree; disagree; and strongly disagree". However, researchers may also find value in alternative options like "always true; usually true; sometimes true; sometimes not true; rarely true, and never true". This is because of its contextual relevance, it may be applicable to the scale items within a research instrument pertaining to the human resource actions. Other elements of likert scale could also be considered in as much as it is relevant to the items within the research instrument being used.

Based on the aforementioned, it is essential for future studies to expand the frontier of knowledge in this area to empirically test the proposition of the paper that the 6-point likert scale is most appropriate for management sciences research studies. This could be done by conducting a comparative illustrative

https://doi.org/10.29114/ajtuv.vol8.iss2.321
Vol.8 Issue 2 (2024)
Published: 2024-12-31
ISSN 2603-316X (Online)

test will provide valuable insights into the effectiveness of the 6-point likert scale and other forms or types of likert scale that are used in the field of management sciences research.

References

Abdi, H. (2010). Guttman Scaling In Neil Salkind (Ed.), Encyclopedia of Research Design. Thousand Oaks, CA: Sage.

Acharya, B. (2010). *Questionnaire design.* Central Department of Population Studies.

Alhassn, I., Asiamah, . N., Opuni, F. F., & Alhassan, A. (2022). The likert scale: exploring the unknowns and their potential to mislead the world. *UDS International Journal of Development*, *9*(2), 867–880. https://doi.org/10.47740/586.UDSIJD6i .

Andersson, B., & Xin, T. (2018). Large sample confidence intervals for item response theory reliability coefficients. *Educational and Psychological Measurement, 78*(1), 32–45. https://doi.org/10.1177/0013164417713570.

Armstrong, R. L. (1987). The midpoint on five-point likert-type scale. *Perceptual and Motor Skills, 64*(2), 359-362. https://doi.org/10.2466/pms.1987.64.2.359.

Benidiktus, T., Rully, C.I.P., & Jeinne, M. (2022). Likert scale in social sciences research: Problems and difficulties. *FWU Journal of Social Sciences, 16*(4), 89-101. http://doi.org/10.51709/19951272/Winter2022/7.

Bourdel, N., Alves, J., Pickering, G., Ramilo, I., Roman, H., & Canis, M. (2015). Systematic review of endometriosis pain assessment: how to choose a scale? *Human Reproduction Update*, 21(1),136–52.

Carifio, J., & Perla, R. (2007). Ten common misunderstandings, misconceptions, persistent myths and urban legends about Likert scales and Likert response formats and their antidotes. *Journal of the Social Sciences, 3*(3), 106-116.

Carlson, M.A., Morris, S., Day, F., Dadich, A., Ryan, A., Fradgley, E.A., & Paul, C. (2021). Psychometric properties of leadership scales for health professionals: A systematic review. *Implement Science, 6*(1):85. doi: 10.1186/s13012-021-01141-z.

Choudhury, S., & Bhattacharjee, D. (2014). Optimal number of scale points in Likert type scales for quantifying compulsive buying behaviour. *Asian Journal of Management Research, 4*(3), 432-440.

Chyung, S. Y. Y., Roberts, K., Swanson, I., & Hankinson, A. (2017). Evidence-based survey design: The use of a midpoint on the likert scale. *Performance Improvement*, *56*(10), 15–23. https://doi.org/10.1002/pfi.21727.

Chyung, S.Y., Swanson, I., Roberts, K., & Hankinson, A. (2018). Evidence-based survey design: The use of continuous rating scales in surveys. *Performance Improvement, 57*(5), 38-48. Doi: 10.1002/pfi.21763.

Corbetta, P. (2003). *Social research: Theory, methods and techniques*. New Delhi: Sage.

https://doi.org/10.29114/ajtuv.vol8.iss2.321
Vol.8 Issue 2 (2024)
Published: 2024-12-31
ISSN 2603-316X (Online)

Croasmun, J. T., & Ostrom, L. (2011). Using likert-type scales in the social sciences. *Journal of Adult Education, 40*(1), 19-22.

Diamantopoulos, A., Sarstedt, M., Fuchs, C., Wilczynski, P., & Kaiser, S. (2012). Guidelines for choosing between multi-item and single-item scales for construct measurement: A predictive validity perspective. *Journal of the Academy of Marketing Science, 40*(3), 434-449. https://doi.org/10.1007/s11747-011-0300-3.

Guy, R. F., & Norvell, M. (1977). The neutral point on a likert Likert Scale. *The Journal of Psychology*, *95*(2), 199–204. https://doi.org/10.1080/00223980.1977.9915880.

Hilbert, S., Küchenhoff, H., Sarubin, N., Nakagawa, T. T., & Bühner, M. (2016). The influence of the response format in a personality questionnaire: An analysis of a dichotomous, a likert-type, and a visual analogue scale. *Testing, Psychometry, Methodology in Applied Psychology, 23*(1), 3-24. doi:10.4473/TPM23.1.1.

Hodge, D. R., & Gillespie, D. F. (2007). Phrase completion scales: A better measurement approach than likert scales? *Journal of Social Service Research, 33*(4), 1-12. https://doi.org/10.1300/J079v33n04_01.

Jamieson, S. (2004). Likertscales: How to (ab)use them. *Medical Education, 38*(12), 1212-1218. https://doi.org/10.1111/j.1365-2929.2004.02012.x

Joshi, A., Kale, S., Chandel, S., & Pal, D. (2015). Likert scale: Explored and explained. *British Journal of Applied Science & Technology*, *7*(4), 396–403. https://doi.org/10.9734/bjast/2015/14975.

Khan, H., Rehmat, M., & Butt, T.H. (2020). Impact of transformational leadership on work performance, burnout and social loafing: A mediation model. *Future Business Journal, 6*(1), 40-53, . https://doi.org/10.1186/s43093-020-00043-8

Kiliç, A. F., Koyuncu, I., & Uysal, I. (2023). Scale development based on item response theory: A systematic review. *International Journal of Psychology and Educational Studies, 10*(1), 209-223.

Krosnick, J. A. (2018). Improving question design to maximize reliability and validity. In D. Vannette, & J. Krosnick (Eds.), *The palgrave handbook of survey research* (pp. 95-101). Cham: Palgrave Macmillan.https://doi.org/10.1007/978-3-319-54395-6_13

Leung, S. O. (2011). A comparison of psychometric properties and normality in 4-, 5-, 6-, and 11-point likert scales. *Journal of Social Service Research*, *37*(4), 412–421. https://doi.org/10.1080/01488376.2011.580697.

Lietz, P. (2010). Research into questionnaire design: A summary of the literature. *International journal of market research*, *52*(2), 249-272.

Lopez, W. (1996). Communication validity and rating scales. *Rasch Measurement Transactions*, *10*(1), 482-483.

Louangrath, P.I., & Sutanapong, C. (2018). Validity and reliability of survey scales. *International Journal of Research & Methodology in Social Science, 4*(3), .99-112. DOI: 10.5281/zenodo.2545038.

https://doi.org/10.29114/ajtuv.vol8.iss2.321
Vol.8 Issue 2 (2024)
Published: 2024-12-31
ISSN 2603-316X (Online)

Luzano, L. M., Garcia-Cueto, E., & Muniz, J. (2008). Effect of the number of response categories on the reliability and validity of rating scales. *Methodology, 4*(2), 73-79. https://doi.org/10.1027/1614- 2241.4.2.73 .

McLeod, S. A. (2019). Likert *scale definition, example and analysis*. Retrieve from www.simplypsychology.org/likertt-scale.html

Menold, N., & Bogner, K. (2016). *Design of rating scales in questionnaires*. GESIS Survey Guidelines. Mannheim, Germany: GESIS – Leibniz Institute for the Social Sciences. doi: 10.15465/gesis-sg_en_015.

Menold, N., Kaczmirek, L., Lenzner, T., & Neusar, A. (2014). How do respondents attend to verbal labels in rating scales? *Field Methods, 26*(1), 21-39.

Murray, J. (2013). Likert data: What to use, parametric or non-parametric? *International Journal of Business and Social Science, 4*(11),, 258-264.

Nordi, P.M. (2006). *Doing survey research: A guide to quantitative methods* (2nd ed). Pearson Education, Inc.

Norman, G. (2010). Likert scales, levels of measurement and the laws of statistics. *Advances in Health Sciences Education, 15*(5), 625-632. https://doi.org/10.1007/s10459-010-9222-y.

Okunbanjo, O.I. (2024). *Entreprenuerial management and business survival*. PhD Thesis, Olabisi Onabanjo University, Nigeria

Olajide, O. T., & Okunbanjo, O. I. (2020). Effects of business process reengineering on organisational performance in the food and beverage industry in Nigeria. *Journal of Business and Management Research, 3*(1-2), 57–74. https://doi.org/10.3126/jbmr.v3i1.32029

Onesti, G. (2023). Exploring the impact of leadership styles, ethical behavior, and organizational identification on workers' well-being. *Administrative Sciences 13*, 149-165. Doi.org/ 10.3390/admsci13060149

Potoglou, D., Burge, P., Flynn, T., Netten, A., Malley, J., Forder, J., & Brazier, J. E. (2011) *Best–worst scaling vs. discrete choice experiments: An empirical comparison using social care data.* Social science & medicine, *72* (10), 1717-1727. Doi:10.1016/j.socscimed.2011.03.027.

Reckase, M. D. (2009). *Multidimensional item response theory*. Springer

Royal, K.D., Ellis, A., Enssien, A., & Homan, A. (2010). Rating scale optimization in survey research: An application of the Rasch rating scale model. *Journal of Applied quantitative methods, 4*(4), 607-617.

Saris, W. E., & Gallhofer, I. N. (2007). Design, evaluation, and analysis of questionnaires for survey research. Hoboken, New Jersey: John Wiley & Sons, Inc

Subedi, B. S. (2016). Using Likert type data in social science research: Confusion, issues and challenges. *International Journal of Contemporary Applied Sciences, 3*(2), 36-49.

https://doi.org/10.29114/ajtuv.vol8.iss2.321
Vol.8 Issue 2 (2024)
Published: 2024-12-31
ISSN 2603-316X (Online)

Taherdoost, H. (2016). How to design and create an effective survey/questionnaire; A step by step guide. *International Journal of Academic Research in Management, 5*(4), 37-41.

Taherdoost, H. (2017). Measurement and scaling techniques in research methodology: survey/questionnaire development. *International Journal of Academic Research in Management, 6*(1), 1-5.

Taherdoost, H. (2022). Designing a questionnaire for a research paper: A comprehensive guide to design and develop an effective questionnaire. *Asian Journal of Managerial Science, 11*(1), 8-16. Doi: https://doi.org/10.51983/ajms-2022.11.1.3087.

Tanujaya, B.,Prahmana, R.C., & Mumu, J. (2022). Likert scale in social sciences research: Problems and difficulties. *FWU Journal of Social Sciences, 16(4),* 89-101. http://doi.org/10.51709/19951272/Winter2022/7.

Vagias, W. M. (2006). Likert-*type scale response anchors*. Clemson International Institute for Tourism & Research Development.

Viljoen, M. (2015). Constructing homogeneous likert-type summative rating scales according to classical measurement theory. *Journal of Social Sciences, 43*(2), 143-151.

Weng, L. J. (2004). Impact of the number of response categories and anchor labels on coefficient alpha and test-retest reliability. *Educational and Psychological Measurement, 64*(6), 956-972. https://doi.org/10.1177/0013164404268674.

Wu, H.S. (2022). *Constructing indices and scales*. CFDR Workshop Series October.

Zelazny, K., Williams, T. F., & Bernstein, L. (2019). Does the number of response options matter? Psychometric perspectives using personality questionnaire data. *Psychological Assessment, 31*(4), 557–566. https://doi.org/10.1037/pas0000648 .