



Scale matters: unravelling the impact of Likert scales on political self-placement

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Abstract

Worldwide, Likert scales are used to measure ideology of both public opinion and individual voters, with the utilization of a self-assessment numerical scale as the most widely accepted tool, despite the multifaceted nature of the concept. However, in contrast to this prevailing consensus, there is a lack of agreement regarding what particular scale should be used and about the benefits of the different scales. This paper seeks to provide insights into these questions by analysing Spanish public opinion ideology as measured by CIS surveys. In 1976, the Centre for Sociological Research (CIS), a leading public body for studies of Spanish society, defined the ideological self-placement scale as being from 1 to 10. Since then, a myriad of different scales has been applied by CIS in more than 1400 surveys (over 3.5 million interviews). In total, we identify 20 scales in studies with available micro-data, with the number rising to 28 when all the CIS studies carried out are included. This research identifies which scale is used in each study and analyses whether this has an effect on the estimation of the ideological distribution of the population. After studying, from an empirical perspective, the relationship structures between the different scales, we conclude that the scale used does have an effect. We finish the paper by offering clear guidelines on how questionnaires related to ideology should be asked.

Keywords Questionnaires · Surveys · Underlying constructs · Likert scales · Political ideology

1 Introduction

Discerning the ideological position of voters is crucial when designing electoral strategies, defining policies and determining the content of the social and economic programmes of political parties and candidates. Measuring political ideology, however, is not an easy task since many factors are at play. Questions about the nationalist sentiment of the respondent, their conservative, liberal or progressive profile, or their voting history, are variables that can help to define, although not without errors, an ideological profile (Sánchez and Sánchez 2009; Bauer et al. 2017; Bellucci and Pellegata 2017; Sánchez 2017; Zuell and

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Scholz 2019; Carroll and Kubo 2021; Sinclair 2022). In any case, despite the multitude of factors influencing a person's ideology, the utilization of a numerical scale for self-assessment remains a widely accepted method to comprehend the collective political tendencies of countries, regions, and communities.

In fact, according to Medina (2015), the left–right dichotomy sets up partisan competition, defines the structure adopted by party systems in each country, and shapes the electoral decision of voters. In reality, asking about ideological self-placement—scaling positions from left to right—already conditions a polarization in the response, motivated to a large extent by the political parties themselves (Cano 2015; Lelkes 2016; Todósijevic 2016; Gestefeld et al. 2022) and by the media (Ramírez and Vinuesa 2021). It is therefore understandable the large amount of effort devoted by Likert scale researchers to study its reliability.

Our research takes a somewhat different approach. We focus on studying what the implications are (what are the consequences) of using different scales, which vary not only in their number of response categories but also in their labelling, on the measurement of ideology and on the ideological classification of the population. We do that by analysing, as a ruling example, the responses of Spaniards to CIS surveys.

The rest of the paper is organised as follows. Section 2 outlines objectives and research questions while briefly presenting a background. Section 3 overviews the international panorama regarding ideological self-placement. Section 4 shows a classification of CIS studies focused on ideological self-placement, detailing the 20 different scales used in the surveys with available microdata and showcasing how the use of multiple scales has evolved over time. In Sect. 5, we analyse the 1461 studies that contain the ideology variable and study the evolution of the yearly average (1977–2022) of ideological self-placement on a 1–10 scale. Section 6 explores the impact of the scale used by comparing the aggregate distributions of ideology attained for the same moment in time with different scales. Section 7 looks more closely at the analysis, focusing on the five studies that ask the same respondents their ideological self-placement using two different scales. We show for each of these studies the transfer relationships between scales. We finish with a discussion of the results and conclusions. This study is accompanied by an appendix of Supplementary Material in which more details of this research are presented.

2 Objectives and background

Ideological self-placement has been measured using a profusion of numerical scales: from a scale of 1 to 3 to a scale of 0 to 10, including a wide range of intermediate options. In fact, ever since Rensis Likert published his seminal work in 1932 on the measurement of underlying constructs (Likert 1932), the study of the number of points/positions that a Likert scale should contain has been a widely researched topic in the literature from a multitude of disciplines and employing different approaches and perspectives. The passage of time has not mitigated the popularity of these topics, as they still continue to attract the interest of researchers today (Kroh 2007; Willits et al. 2016; Matas 2018; Taherdoost 2019; Aybek and Toramen 2022). An extensive review of recent literature that covers most of the relevant aspects that affect a Likert scale can be found in papers by Joshi et al. (2015), Jebb et al. (2021) and Alabi and Jelili (2022).

Analysis of the use of a scale is, in fact, even more complex than at first sight, since, in addition to numerical values, the scales may also include explanations/descriptions,

generally partial, with text labels. These labels are usually located at the two extreme points (or anchors) of the scale and also, at times, in other positions. We ask, therefore, what, if any, impact these practices may have on the outcome.

Indeed, while the central section of the scale usually contains numbers, normally it is only the extremes of the ideological self-placement scale that contain labels, such as “Left” and “Right” or “Extreme left” and “Extreme right”. This is despite the existence of research (e.g., Krosnick 1991) that advocates the convenience of using fully labelled scales for a better understanding of the question by the respondents. The literature, however, has not reached a consensus on this point. Other authors suggest that a scale with more numbers, and the majority unlabelled, may allow the respondent to select a position closer to his or her political ideology (McRoy and Pancratz 2020).

A larger scale, however, raises various practical problems and may not make a significant difference. On the one hand, more possibilities of choice can cause cognitive difficulties in choosing (Schwartz 2005), or make the recommendation to label each one of the values of the scale more difficult to follow due to the need to have an ever-growing dictionary of words, and to guarantee that the distances between two contiguous words have the same value (Cummins and Gullone 2000). On the other hand, there are studies that show minimal sensitivity in the results to changes in the number of points on the scale (Evans 2019; McRoy and Pancratz 2020). There is even research that analyses whether the direction of the scales influences the responses (Stefkovic 2022), i.e., the impact of reversing the scale, and whether the results would change if the scale was turned the other way round. In fact, although the CIS usually uses a left–right scale, in fourteen of its studies it tried a change of direction, with the scales fully labelled.

The enormous variety of scales in use prompts a plethora of questions, such as: Can using a particular number of points or more on a scale condition the result in terms of both averages and distributions? How does labelling influence respondents? On a scale of 0 to 10, is it possible that respondents do not identify with 0 because they see it as a number with negative connotations? The most used scale is 1 to 10 (Dassonneville 2020) despite the fact that it does not have a centre but rather two, the values 5 and 6. Is the value 5 identified as the centre, biasing the responses to the left? (Del Castillo 2004). Or is it possible that 5 is considered as a non-political option when the “None” option is not explicitly available? Why not use a 1–9 scale with a clear centre and symmetry on the left–right axes? (Nilsson and Erlandsson 2015). Will the convenience of using one or the other scale depend on the object of study? Or, as Bisquerra and Pérez (2015) indicate, is the 11-point scale (0–10) the ideal one?

This study seeks to answer the above questions in relation to the measurement of the distribution of ideological self-placement, leveraging on the CIS surveys. We are not only interested in measuring the impact of scales on estimated averages, but we are also interested in knowing how they impact on the ideological classification of the population. On the one hand, to study the comparability of means (i.e., the reliability of the different scales), we *homogenize* the different scales used over time to show the evolution over time of the ideology average. On the other hand, to analyse the validity, we capitalize on the simultaneous occurrence of a substantial number of studies utilizing diverse scales at the same time and study the distributions of ideological self-placement as a function of the scale used. Furthermore, by having five studies in which the same people placed themselves ideologically on two alternative scales, we exploit individual responses to study transfer/relationship structures between scales. With respect to this last point, there are limitations: it is impossible to assess whether a change in the order of the questions would have produced different transfers and whether the respondent’s

perception that they were being asked the same question twice could have influenced the outcome.

Similarly, we cannot overlook the effect that the non-response option may have on the outcome. All the questions studied include the non-response options “Do not know” and “No answer” and we consider their analysis essential, among other things, to detect what ideological position is hidden behind these answers. In other words, it could be that the choice of these answer options hides an apolitical position, a lack of knowledge of one’s own ideology, a misunderstanding of the question, a disagreement with the proposed scale or an electoral abstention (Camino 2022). A comparison of the studies that do include the options “None” or “Apolitical” or “It depends” with those that do not include any of these options may shed light on the reasons behind these responses. This issue is also relevant because the ideological self-placement variable is also routinely employed as a classification variable to respond many other inquiries. For instance, to answer questions about how centre voters behave. And, as we will see, being the ideological centre a very slippery category in conceptual terms, the scale employed and the response options available are not innocuous. They have a significant influence on shaping the ideological distributions. They impact on how many responders, and what kind of responders, end in the centre of the ideological scale, impacting eventually on the final estimated distributions and on the validity of the responses to the inquiries based on them.

Finally, note that, despite having identified 20 different scales (as shown in Sect. 4) in CIS surveys, we have not considered it appropriate to distinguish between the same scale options which are presented vertically instead of horizontally, even though there are studies that show that the question format can condition the answer by visually distorting changes in distances (Weijters et al. 2021). We consider that, in this case, the orientation of the scale is not as important as it happens in other scales, such as “Totally agree”, “Agree”, “Neither agree nor disagree”, “Disagree”, “Totally disagree”.

3 Brief international overview of ideological self-placement measurement

The variety of scales used is not just a characteristic of the Spanish institution CIS; it is also seen at an international level, where the two most used scales are from 1 to 10 and from 0 to 10, although there are also alternatives in use with 5 or 7 levels/points.

In Europe, the ‘official’ survey of the state of public opinion across this continent is the Eurobarometer, used by the European Parliament, the European Commission and other EU institutions and agencies. In Otero (2008), an application of Eurobarometer #61 is analysed, where the scale is 1 to 10, such as the one used in the questionnaire on the 2019 European elections (European Parliament 2019). The General Social Survey (GSIS) in Germany also uses this same scale (Bauer et al. 2017). However, in surveys carried out by ITANES (the Italian National Election Studies association) the scale used goes from 0 to 10, as is also the case in the Serbian Public Opinion Study (SPOS) (Todosijevic 2016) and in the European Social Surveys (ESS) (Rodon 2015; Armingeon and Weisstanner 2022). France, in its Barometre de la Confiance en Politique of February 2023, carried out by CEVIPOF (Centre de recherches politiques de Sciences Po), also uses the scale from 0 to 10 (CEVIPOF 2023). Finally, to mention just one more European example, Great Britain in its British Social Attitudes (BSA) survey carried out by the National Centre for Social

Research has, since 1983, measured ideological self-placement using 5 points (BSA 2023), while YouGov uses a scale of 0 to 10.

The Latinobarometer, a study designed and directed by the Latinobarometer Corporation, is carried out in 18 Latin American countries and, since 1996, in Spain through the CIS. It offers 15 studies measuring ideology from 0 to 10, but which include the “None” option (CIS 2023).

In the USA, the scale from 1 to 10 is used in the World Values Survey (Haerper et al. 2022), although in North America it is more common to define liberal-conservative axes instead of left–right. However, there are exceptions, such as the Chapel Hill Expert Surveys, which use a classic 0–10 scale (Hooghe et al. 2010). For example, the General Social Survey (GSS) uses a scale from 1 to 7 differentiating extremely liberal, liberal, slightly liberal, moderate, slightly conservative, conservative, extremely conservative (GSS 2022) or uses 5 points, which describe liberal, moderate, conservative, don’t know, refuse (Shino et al. 2022), or even a scale based on a set of questions (Dimock et al. 2014).

From a more global perspective there is the International Social Survey Programme (ISSP). The ISSP is an ongoing annual programme of collaboration between more than forty countries around the world that conducts consensus surveys among all participating countries. Spain is represented in the ISSP through CIS and ASEP, which alternate annually in carrying out the surveys. In those studies, in which CIS participated, 11 studies used the 1 to 10 scale and another 4, the 0 to 10 scale. The CSES (Comparative Study of Electoral Systems), which covers electoral polls from countries on several continents (CSES 2022), also uses the 0–10 scale.

4 Description of the CIS studies regarding ideological self-placement

The Centre for Sociological Research (CIS) is an autonomous entity affiliated to the Ministry of the Presidency of the Spanish Government that is dedicated to the in-depth examination of Spanish society, mainly by applying surveys. Established as a reputable institution, the CIS operates with the mandate of providing comprehensive insights into various aspects of societal dynamics by conducting periodic surveys meticulously designed to capture a wide array of opinions, attitudes, and behaviours of the Spanish population. The CIS undertakes this investigative role either independently, initiating studies that address relevant social issues, or in response to specific requests from other organizations, seeking a nuanced understanding of prevailing societal trends. Since January 2009, the CIS has offered, openly and free of charge through its website (www.cis.es), the available microdata files from the surveys carried out by the Centre together with the metadata necessary for their use. The CIS constantly tries to enhance this information by recovering the microdata of studies which have only questionnaires or other files online.

4.1 Classification of CIS studies

The CIS database offers information on 2197 studies (in addition to 55 qualitative studies) up to and including the year 2022 (in the moment of writing this paper). Of these, 630 do not have microdata, although this figure is progressively decreasing, since the CIS is gradually incorporating missing information (microdata) into its database. The studies carried out by the CIS cover a variety of topics and can be grouped according to various classifications. In this paper we propose a grouping into five blocks that we

consider useful when analysing the political ideology variable, which is the focus of this paper. This grouping proposal, partially based on the criteria used by the CIS to classify its survey studies, considers the overall theme of the studies and the survey implementation method, addressing logistical considerations such as the location of studies. Specifically:

- *Barometers (BAR)*: this group is made up of a set of surveys that are carried out on a monthly basis (except the months of August) with the objective of measuring the state of Spanish public opinion at the time. To do this, around 2,500 people are interviewed (3,000 since September 2018), chosen at random, within the national territory, on whom, in addition to their opinions, extensive social and demographic information is collected for analysis. These surveys were previously carried out in homes through a complex sample selection procedure (see details in, for example, Pavía and Aybar 2018), but since the start of the COVID-19 pandemic they have become telephone-based.
- *Consumer Confidence Index (ICC) studies*: this group is made up of a set of monthly studies designed to ascertain the spending intentions of consumers, who are asked about their current perception and future expectations for the country's economy, their family economy and employment. Each survey is carried out by telephone on a sample of 3,000 individuals, over 16 years of age, representative of the whole of Spanish society.
- *Electoral surveys (ELE)*: this group is made up of surveys carried out during the electoral period (pre-electoral) and/or later (post-electoral), on municipal, regional, national and European elections. Similar to barometer surveys, these are now being completed by telephone, assisted by a computer, since the CIS interviewers now telework (this is also the case for the following two groupings).
- *Studies on political issues (POL)*: this group is made up of non-periodic surveys of a political-institutional nature which cannot be included in the previous category, covering issues of the State, the Constitution and institutions, political culture, political parties and leaders.
- *Other studies (OTE)*: this last group is made up of a set of studies that cannot be included in the previous groups, their main objective being to delve into a multitude of different topics, such as the economy, work, topics related to the population (immigration, family and forms of coexistence, birth, childhood, youth, old age, women), environment, communication, culture, leisure and sports, science and technology, education, health, justice, etc.

To demonstrate the importance that the measurement of ideological self-placement has for the CIS, Table 1 offers the distribution of the number of studies grouped according to this classification, detailing the number of studies that ask about the ideological self-placement. The category which shows the most studies in this respect is OTE, although it is true that in 18% of the cases the ideological self-placement of the respondent is not asked. With approximately 400 studies, the BAR and ELE categories

Table 1 Distribution of studies (with microdata) by type of study and ideology

Type of study	With ideology	Without ideology	Total
BAR	402	4	406
ICC	133	0	133
ELE	377	5	382
POL	164	4	168
OTE	395	87	482
TOTAL	1471	100	1571

The number of studies classified in each combination has been obtained from information dated December 31, 2022. Study 2743, classified in this research with the prefix POL (studies on political issues), has been broken down into two (2743A and 2743B) and treated as two independent studies given that it was applied to two different samples. Studies 3242, 3245, 3263 and 3269 have been included for the purposes of this statistic in two groups (*BAR* barometers, and *ELE* electoral surveys) as they correspond to both groups

Totals by rows and columns in bold

also play an important part in the CIS studies. Only 4 of the 406 available barometers did not ask about political ideology. In the ELE block, which includes electoral surveys, this variable is present in 98.7% of the studies.

4.2 Taxonomy of scales used by the CIS

Over the years (from 1976 to 2022), the question of ideological self-placement has been posed by the CIS using 8 different numerical scales that, combined with the different text labels used and the different options used to capture other response alternatives, results in 28 different ways of measuring. Microdata are not available for 8 of them, although the availability of the questionnaires permits to know them. These correspond to scales from 1 to 3, from 1 to 4 and different variants from 1 to 5. Excluding these scales, we find a total of 20 different definitions of ideological self-placement.

During the construction of the taxonomy of scales we maintained the chronological order of their use by the CIS. Table 2 shows the grouping into 6 numerical scales and includes the 20 scales with response specifications found within the numerical scales. In the rest of the paper, we use the code in brackets in Table 2 to identify each scale.

Table 2 Response options according to type of scale

Scale		Response options
1–5	(S1)	Extreme left, left, centre, right, extreme right
1–6	(S2)	Extreme left, left, centre-left, centre-right, right, extreme right
1–7	(S3)	Extreme left, left, centre-left, centre-right, right, extreme right
	(S4)	Extreme right, right, centre-right, centre, centre-left, left, extreme left, does not accept this distinction
	(S5)	Extreme left, left, centre-left, centre, centre-right, right, extreme right
	(S6)	Left, right
	(S7)	Extreme right, right, centre-right, centre, centre-left, left, extreme left
	(S8)	Extreme left, left, centre-left, centre, centre-right, right, extreme right, none
1–10	(S9)	Left, right
	(S10)	Extreme left, extreme right
	(S11)	No text
	(S12)	Extreme left, left, centre, right, extreme right
	(S13)	Very left, very right
	(S14)	Left, centre (5), right
	(S15)	Left, right, none
	(S16)	Far left, far right
0–10	(S17)	Extreme left, extreme right
	(S18)	Left, right, none
	(S19)	Left, right
By pairs	(S20)	In the questionnaire file (study 2692) the scale 1 to 10 appears, but in the microdata appear the pairs (1–2), (3–4), (5–6), (7–8), (9–10)

Although 6 groups and 20 different scales have been identified, these are not all used to the same extent, quite the contrary. The number of studies in which each of the scales is used is presented in Table 3. The data in the table show that in 85.47% of the studies

Table 3 Distribution of studies according to type of scale

Scale	Number of studies	Scale	Number of studies
S1	2	S11	1
S2	2	S12	1
S3	31	S13	1
S4	1	S14	2
S5	2	S15	16
S6	1	S16	63
S7	5	S17	2
S8	1	S18	20
S9	1259	S19	21
S10	40	S20	1

Five studies contain a double scale of ideological self-placement: POL1163 (S3 and S4); OTE2731 (S2 and S17); POL2743A (S1 and S9); POL2743B (S1 and S19); ELE3198 (S8 and S9)

in which the ideological self-placement is asked the scale used is S9 (1–10), identifying 1 with “Left” and 10 with “Right”. The second largest group, although far behind the first since it is used twenty times less frequently, is made up of the surveys that use the S16 (1–10) scale, where the label “Far left” is added to 1, and to 10 “Far right.” However, this scale has been used by the CIS in 78.05% of studies carried out in 2022, revealing a possible change in their approach. Overall, the scales made up of 10 levels/points are the most used by the CIS, being employed 94% of the time.

More details of the relationships between scales and studies is presented in Section A1 of the Supplementary Material. There, the studies are identified using a prefix that identifies the type of study (BAR, barometers; ICC, consumer confidence indicators; ELE, electoral studies; POL, political studies; and OTE, other topics) followed by 4 digits that give the number to which the study corresponds in the CIS database.

4.3 Analysis of the use over time of the scales by the CIS

Figure 1 shows, in time perspective, the frequency with which each of the scales has been used over time in the CIS questionnaires. As can be seen, until the end of 1983 the most used scale was S3 (1–7), identifying 1 with “Extreme left” and 7 with “Extreme right”, while from 1983 scales from 1–10 were used more frequently. From 1983 to 1985 the S10 scale was used, identifying 1 with “Extreme left” and 10 with “Extreme right”, and from 1985 the S9 scale was implemented. At the end of 2019 the S16 scale began to be used more frequently (1–10), identifying 1 with “Far left” and 10 with “Far right”, thus avoiding the use of the word “Extreme”.

As shown in Table 1 and Fig. 1, the S9 scale (1–10) has been the most used (especially since 1985). Its use is not homogeneous between study categories, with studies on political issues (POL) and other studies (OTE) showing more scale variability; practically all of these currently tend to use the S16 scale, a scale from 1 to 10, while defining the boundaries, such as with the expressions “Far left” and “Far right”.

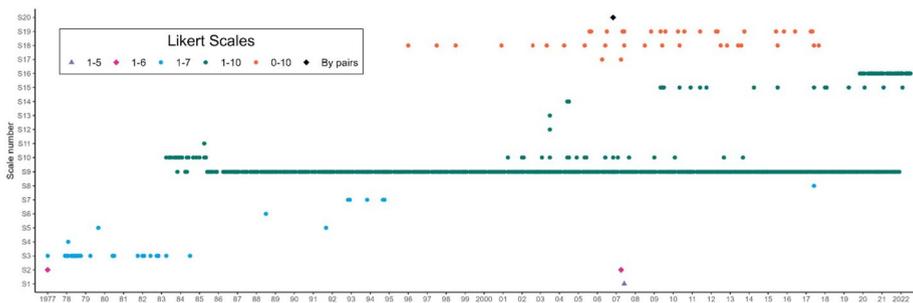


Fig. 1 Evolution over time in the use of the different scales by the CIS (1977–2022). (Source: compiled by the authors based on CIS data)

5 Evolution over time of the ideological self-placement average

On the Likert scales, the response categories are arranged in such a way that the distances between contiguous categories are as homogeneous as possible, and may have a neutral point (DeVellis 2003) which corresponds to a centrist ideology in the political context. The question of whether “data should be processed on an ordinal scale or on an equal interval scale” is often raised. According to Norman (2010), Likert scales are similar to equal interval scales and can be used in parametric analyses with this assumption. In fact, simulation-based studies (Harpe 2015; Huiping and Shing-On 2017; Mircioiu and Atkinson 2017; Wu and Leung 2017; Canto de Gante et al. 2020) show that increasing the number of qualifications in the response category of a Likert scale would result in a normal distribution and would be similar to an interval scale. The CIS itself treats the self-placement variable of the ideological scale as quantitative, using its average value as a reference indicator and its standard deviation as a measure to verify the validity of the calculation of the average (Del Castillo 2004).

In accordance with the previous arguments, it is considered legitimate to perform quantitative transformations on the data, treating the observations as numerical values measured on an interval scale. The use of different scales by the CIS over the years, sometimes motivated by international agreements, makes it difficult to compare the results. Therefore, in order to study the evolution over time of the average in ideological self-placement in Spain, all the responses are transferred to a 1–10 scale, used in 94% of studies with available microdata. The scales of the remaining 6% of studies are homogenized (re-scaled) to the 1–10 scale, using:

$$x_k = x_{k-1} + \frac{9}{n - 1}$$

where $x_1 = 1$, k takes values from 1 to 10 and n is the number of options of the initial scale.

Note, however, that the 1–10 scale presents a certain weakness with respect to its perceived average value, in our opinion. The central value as perceived by the respondent is usually 5 (see, for example, DeVellis 2003) when the actual average value associated with the scale is 5.5. This can cause some dissonance, distorting the analyses and skewing the results slightly to the left.

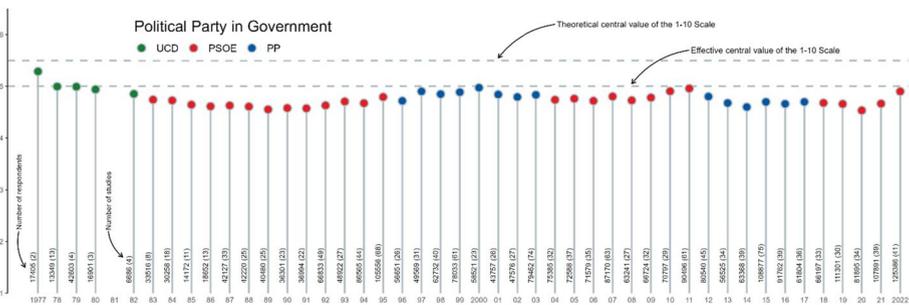


Fig. 2 Evolution of the annual average (1977–2022) of ideological self-placement on a 1–10 scale. The values were re-scaled to the 1–10 scale for those studies with a different scale. (Source: compiled by the authors based on CIS data)

Once all the available studies are homogenized, we analyse how the average of the ideological self-placement of Spaniards has evolved over time. As can be seen in Fig. 2, the annual average of ideological self-placement is always lower than the theoretical average value of the scale. Also, changes in government are always preceded by several years where the trend in the evolution of the average varies away from the theoretical zone of the ruling political party towards the area of the main opposition party.

6 Impact of the scale used on the distribution of ideological self-placement of Spaniards

As shown in Sect. 4, the CIS has used a wide variety of scales over time, many of them simultaneously in different studies, which were carried out at the same moment in time. It is therefore possible to consider a typical model of clinical trials with case-control pairings and compare the distributions obtained by measuring, in independent samples, the same reality (the distribution of ideological self-placement of Spaniards) at the same moment in time on different scales. For the pairings we only consider surveys whose coverage was of the Spanish population as a whole (resident in Spain) and whose data collection period (fieldwork) took place in the same month and year. Figures 3, 4, 5, 6, and 7 present the distributions derived from the pairings formed, and their analysis provides answers to many of the research questions posed in Sect. 2.

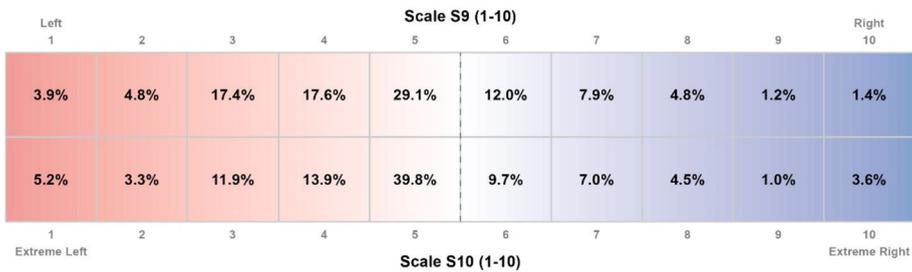


Fig. 3 Distributions of ideological self-placement obtained with the S9 and S10 scales of samples collected at the same moment in time. Details in Section A2.1 of the Supplementary Material. (Source: compiled by the authors based on CIS data)

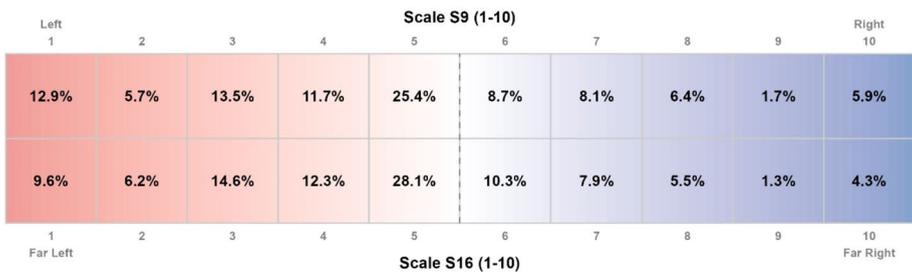


Fig. 4 Distributions of ideological self-placement obtained with the S9 and S16 scales of samples collected at the same moment in time. Details in Section A2.2 of the Supplementary Material. (Source: compiled by the authors based on CIS data)

Figures 3 and 4 show the distributions obtained using two 1–10 scales that only differ in how the extremes are labelled. Figure 3 shows that the use of the word “extreme” does not seem to have an appreciable effect in left/right dichotomous terms: 72.8% and 74.1% of the population is located on the theoretically left side (1–5) of the scale. However, contrary to expectations, the use of the adjective “extreme” places a greater number of respondents at the limits of the scale. In the case of left-wing voters, however, it acts as a repellent by relatively emptying scores 2 to 4 and significantly increasing the percentage of respondents who rank themselves 5: 39.8% vs. 29.1%.

On analysing the results of Fig. 4, we reach the same conclusions in terms of left/right grouping: 69.2% rank themselves below 5 on the S9 scale and 70.8% on the S16 scale. In terms of the extremes of the distribution, the use of the expression “Far...” acts as a repellent, especially on the left (again), pushing respondents towards more central positions.

Figure 5 shows the summary of the distributions obtained at the same moment in time with the S9 and S19 scales. The S19 scale differs from the S9 in having one more category (zero) and a well-defined geometric centre. The comparison between these two scales makes it possible to reaffirm a result previously identified in the literature (see, for example, Del Castillo 2004): that the score 5 is interpreted, by a majority of Spaniards, as the centre on scales with a maximum value of 10, regardless of whether that value is or is not effectively the geometric centre. In fact, on the S9 scale, 43.4% of the respondents ranked themselves between 1 and 4 (that is, what would be considered as left if we assume that 5 is the centre of the scale), while on the S19 scale 45.9% of those interviewed rank between 0 and 4. This also suggests that the effect of starting the scale at 0 is minimal, since it does not seem to disincentive respondents from choosing the lower end of the scale.

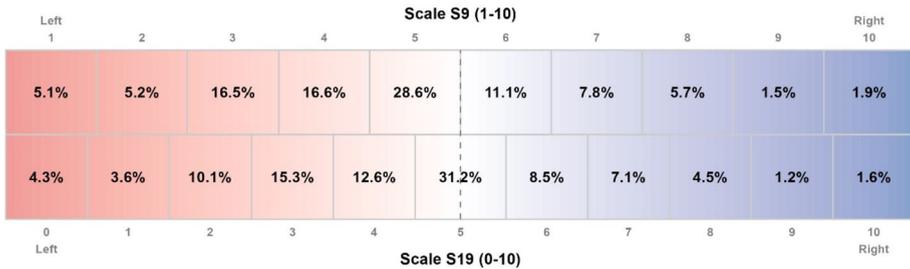


Fig. 5 Distributions of ideological self-placement obtained with the S9 and S19 scales of samples collected at the same moment in time. Details in Section A2.3 of the Supplementary Material. (Source: compiled by the authors based on CIS data)

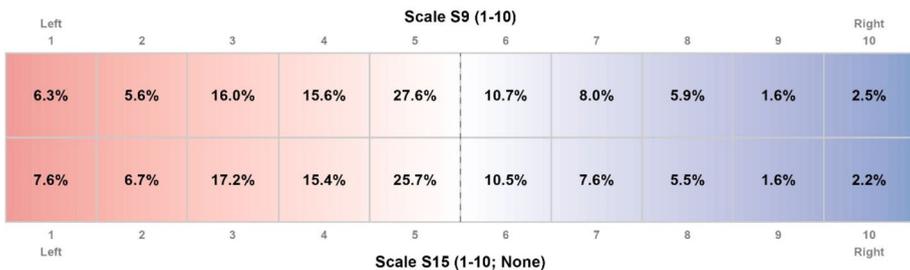


Fig. 6 Distributions of ideological self-placement obtained with the S9 and S15 scales of samples collected at the same moment in time. Details in Section A2.4 of the Supplementary Material

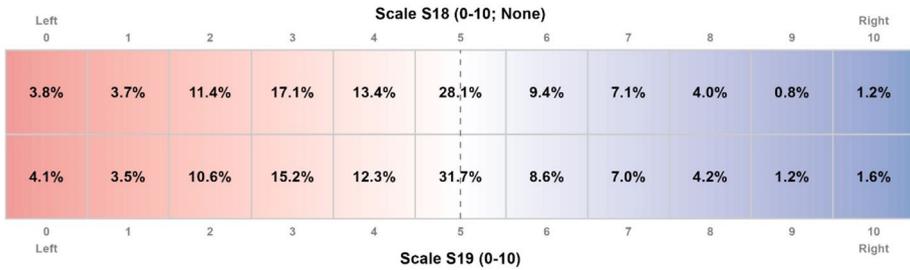


Fig. 7 Distributions of ideological self-placement obtained with the S18 and S19 scales of samples collected at the same moment in time. Details in Section A2.5 of the Supplementary Material

Figures 6 and 7 show the distributions obtained on two different scales (with 10 levels and 11 levels, respectively), but which differ in the inclusion or not of a response alternative, identified with the label “None”, outside of the scale. Both pairs of distributions are generally quite similar, their main differences focusing on the number of interviewees who place themselves at 5, identified as the centre of both scales by the majority of citizens. The weight of 5 is slightly lower in the scale that includes the label “None”, suggesting that a proportion of the citizens characterized by not having any ideology would tend to interpret the central point of the scale as equivalent to indifference, to no positioning, preferring to place themselves in the centre of the scale rather than not respond (perhaps due to social desirability).

7 Transfer relations between scales

The previous analyses allow us to compare estimates of distributions obtained at the same moment in time (so theoretically they are approximating the same underlying distribution) with different scales but taken from different questionnaires and samples. In this section we look more closely at this analysis, eliminating the effect of different samples and questionnaires, to compare how the same people locate themselves on two different scales. We do this by using the five studies in which the CIS carried out the exercise but with two measurement scales in the same questionnaire (one text only and one numeric, and almost always with several different response categories on each scale). We refer to the data available in the studies: POL1163, in which the S3 and S4 scales are used; OTE2731, scales S2 and S17; POL2743A, scales S1 and S9; POL2743B scales S1 and S19; and ELE3198, scales S8 and S9. More detail on these studies is provided in Section A3 of the Supplementary Material. We measure the relationships between the scales from the cross-distributions of respondents’ ideological self-placement responses.

Figures 8, 9, 10, 11, and 12 show the transfer matrices between the scales used in each of these studies. These figures show the standardized row transfer matrices, also incorporating the information on the crossed distributions, which would allow the composition matrices to be easily reconstructed (Pavía and Aybar 2020). The matrices are organised with the scale with text-only response options always on the vertical axis and the numerical scale on the horizontal axis. In the graphic representations we use two visual elements to highlight the weight that each cell has with respect to the total (the larger the font size, the

greater the weight) and the relative importance of each cell within each row (the greater the colour intensity, the greater the corresponding percentage in terms of the standardized row distribution).

7.1 Transfers between S4 and S3 scales (Study 1163)

Study 1163, carried out in July 1978, belongs to the “Politics (POL)” block. In this study, questions 25 and 33 asked about the respondent’s ideological self-placement. In question 25, the S4 (1–7) scale was used, offering 9 text-type response alternatives (see Fig. 8). In question 33, the measurement scale S3 (1–7) was used, but specifying only the texts “Extreme left” and “Extreme right”, “Don’t know” and “No answer”. The transfer matrix between both scales shows that most of the responses of ideological self-placement are counted on the diagonal. This is the theoretically expected result because, despite the fact that in the first question the order of the answers was raised in reverse order (from right to left), the diagonal synthesizes the theoretical text-number relationships. The figure, however, is lower than expected a priori: only 53.7% of those who placed themselves on one of the two scales located themselves exactly on the diagonal.

Other results also stand out: 44% (22.7%) of the respondents who marked the option “Do not accept this description” (“DK/NA”) on the text scale did position themselves on the numerical scale, a circumstance that points towards the conclusion of a higher rate of self-placement when the scales are numerical. In fact, 11% more substantive responses were collected on the numerical scale than on the text scale. The greatest alignment (73.5%) is observed among those who chose “Centre”, although, even so, 10.6% placed themselves at 5 (which would correspond to “Centre right”) and 6% selected 3 (equivalent to “Centre Left”), with 14% selecting other options.

		Scale S3 (1-7)							Don't know	No answer		
		1	2	3	4	5	6	7				
Scale S4 (1-7)	Extreme Left	12 (0,545)	6 (0,273)	3 (0,136)		1 (0,049)						22
	Left	5 (0,029)	142 (0,561)	59 (0,233)	10 (0,040)	13 (0,051)	8 (0,032)	1 (0,004)	8 (0,032)	7 (0,028)	253	
	Centre-Left	1 (0,007)	5 (0,023)	101 (0,664)	23 (0,151)	16 (0,105)	1 (0,007)	1 (0,007)	2 (0,011)	2 (0,011)	152	
	Centre		1 (0,005)	13 (0,060)	158 (0,735)	23 (0,107)	3 (0,014)	1 (0,005)	10 (0,047)	6 (0,029)	215	
	Centre-Right		1 (0,016)	4 (0,043)	8 (0,127)	39 (0,619)	7 (0,111)	1 (0,016)	2 (0,032)	1 (0,016)	63	
	Right	1 (0,017)	4 (0,068)	4 (0,068)	4 (0,068)	8 (0,136)	26 (0,441)		5 (0,136)	4 (0,068)	59	
	Extreme Right		1 (0,143)				1 (0,143)	5 (0,714)			7	
	Don't accept this distrib.	5 (0,026)	11 (0,058)	19 (0,100)	36 (0,189)	8 (0,042)	3 (0,016)	1 (0,009)	53 (0,279)	54 (0,284)	190	
	DK/NA		5 (0,023)	9 (0,041)	26 (0,118)	8 (0,038)	3 (0,009)		96 (0,436)	74 (0,336)	220	
		24	176	212	265	116	51	10	179	148	1181	

Fig. 8 Study POL1163. Comparison of responses using measurement scales S4 (1–7), text only, and S3 (1–7), numerical scale

		Scale S17 (0-10)										Don't know	No answer				
		0	1	2	3	4	5	6	7	8	9				10		
Scale S2 (1-6)	Extreme Left	12 (0,000)	7 (0,292)	8 (0,258)													24
	Left	17 (0,029)	38 (0,064)	190 (0,322)	206 (0,349)	92 (0,156)	36 (0,061)	2 (0,003)	1 (0,002)	1 (0,002)				4 (0,007)	2 (0,005)		590
	Centre Left	1 (0,002)	1 (0,002)	18 (0,032)	129 (0,230)	271 (0,482)	129 (0,230)	2 (0,004)	1 (0,002)	1 (0,002)				4 (0,007)	5 (0,009)		562
	Centre Right					4 (0,009)	157 (0,360)	203 (0,466)	51 (0,117)	13 (0,030)	2 (0,005)	2 (0,005)		3 (0,007)	1 (0,002)		436
	Right			1 (0,005)		1 (0,002)	14 (0,027)	33 (0,158)	78 (0,373)	64 (0,306)	7 (0,013)	7 (0,013)		4 (0,018)			209
	Extreme Right						1 (0,017)			2 (0,154)		8 (0,015)		1 (0,017)	1 (0,017)		13
	Don't know	1 (0,002)			4 (0,009)	6 (0,014)	105 (0,241)	4 (0,009)	1 (0,002)				1 (0,002)	283 (0,651)	30 (0,069)		435
	No answer			6 (0,012)	5 (0,016)	12 (0,024)	100 (0,196)	10 (0,020)	2 (0,004)	1 (0,002)			1 (0,002)	21 (0,041)	351 (0,690)		509
			31	46	220	344	386	542	254	134	82	9	19	320	391		2778

Fig. 9 Study OTE2731. Comparison of responses using measurement scales S2 (1–6), text only, and S17 (0–10), numerical scale

7.2 Transfers between the S2 and S17 scales (study 2731)

In study 2731 (September 2017), belonging to the block “Other studies” (OTE) and entitled “Attitudes towards discrimination due to racial or ethnic origin”, the question relating to ideological self-placement was asked twice (questions 32 and 33). In question 32, the S2 scale (1–6) was used, with 8 text-type response alternatives (see Fig. 9). In question 33, the numerical scale S17 (0–10) was used, offering 13 response alternatives including “Don’t know” and “No answer”, and with the extremes of the scale labelled in the same way as the extremes of the S2 scale. As in Fig. 8, in Fig. 9, again, a strong theoretical alignment is observed between the answers of the respondents in both classifications. Most of the responses are classified around the “diagonal”. It is notable, however, that 24% (20%) of those surveyed who marked “Don’t know” (“No answer”) in question 32 selected score 5 in question 33. This shows that in the absence of the “Centre” option, a proportion of those surveyed prefer not to give a response that assigns the adjective “Left” or “Right” to themselves.

7.3 Transfers between scales S1 and S9 and S1 and S19 (studies 2743 A and B)

In November 2007, the CIS carried out a study with the aim of measuring the effects arising from the question formats used in a questionnaire. This test consisted of two independent studies (2743A and 2743B), since it was applied to two different samples. In both, the S1 (1–5) scale was used in question 18, with 7 response alternatives on a text scale (see Figs. 10 and 11), together with a numerical scale. In the first, the S9 (1–10) scale was used and in the second, the S19 (0–10) scale, both for question 28.

As in the two previous cases, the majority of respondents related (Extreme) Left to the lower numerical values and (Extreme) Right to the higher numerical values, but the term “Extreme” was not used on the numerical scale. Likewise, also in these studies, a proportion of the respondents preferred to avoid labels. Despite the fact that the “Centre” option was available on the S1 scale (1–5), in both study 2743A and study 2743B, a proportion of the respondents simultaneously selected 5 on the numerical scale and “Don’t know” (“No answer”) on the text scale; 13.2% and 18.1%, respectively, in the first case, and 18.2% and

Scale S9 (1-10)

		1	2	3	4	5	6	7	8	9	10	Don't know	No answer		
Scale S1 (1-5)	Extreme Left	13 (0,112)	1 (0,002)	1 (0,002)	1 (0,002)										16
	Left	40 (0,061)	77 (0,117)	286 (0,436)	182 (0,277)	54 (0,082)	2 (0,003)						9 (0,014)	6 (0,009)	656
	Centre		3 (0,006)	11 (0,023)	44 (0,094)	259 (0,551)	72 (0,153)	27 (0,057)	13 (0,028)			1 (0,002)	20 (0,043)	20 (0,043)	470
	Right			1 (0,004)	1 (0,004)	14 (0,057)	58 (0,237)	77 (0,314)	55 (0,224)	13 (0,053)	17 (0,069)		3 (0,012)	6 (0,024)	245
	Extreme Right									3 (0,272)	2 (0,142)	5 (0,465)	1 (0,091)		11
	Don't know	1 (0,003)	3 (0,010)	19 (0,034)	7 (0,024)	39 (0,132)	10 (0,034)	5 (0,017)					181 (0,614)	39 (0,132)	295
	No answer	1 (0,003)	1 (0,003)	6 (0,021)	10 (0,035)	52 (0,181)	7 (0,024)	3 (0,010)	1 (0,002)				22 (0,076)	185 (0,642)	288
		55	85	315	245	418	149	112	72	15	23	236	256	1981	

Fig. 10 Study POL2743A. Comparison of responses using the measurement scales S1 (1–5), text only, and S9 (1–10), numerical scale

Scale S19 (0-10)

		0	1	2	3	4	5	6	7	8	9	10	Don't know	No answer		
Scale S1 (1-5)	Extreme Left	11 (0,478)	3 (0,130)	2 (0,087)	2 (0,087)	1 (0,040)									4 (0,174)	23
	Left	25 (0,036)	40 (0,058)	141 (0,204)	237 (0,342)	160 (0,231)	61 (0,088)	2 (0,003)	1 (0,001)			1 (0,001)	1 (0,001)	12 (0,017)	11 (0,016)	692
	Centre	1 (0,002)		5 (0,011)	26 (0,057)	37 (0,082)	284 (0,627)	42 (0,093)	27 (0,060)	3 (0,007)			3 (0,007)	9 (0,026)	16 (0,035)	453
	Right				4 (0,014)			12 (0,048)	76 (0,311)	68 (0,279)	45 (0,184)	13 (0,053)	20 (0,022)	4 (0,016)	7 (0,008)	244
	Extreme Right					1 (0,167)				1 (0,167)	1 (0,167)	1 (0,167)	1 (0,167)	1 (0,167)	6	
	Don't know	2 (0,007)	1 (0,003)	4 (0,014)	8 (0,027)	9 (0,031)	53 (0,182)	9 (0,031)	4 (0,014)	3 (0,010)	1 (0,003)			169 (0,579)	29 (0,099)	292
	No answer	5 (0,016)	3 (0,011)	7 (0,026)	19 (0,037)	19 (0,037)	53 (0,194)	4 (0,010)	5 (0,016)			2 (0,007)	13 (0,048)	171 (0,626)	273	
		44	44	155	284	218	463	133	106	52	16	27	208	233	1983	

Fig. 11 Study POL2743B. Comparison of responses using the measurement scales S1 (1–5), text only, and S19 (0–10), numerical scale

19.4% in the second. This could indicate that there is a proportion of respondents who either do not like the labels or identify 5 as not an ideological position.

7.4 Transfers between the S8 and S9 scales (Study 3198)

The fifth and last study in which the CIS asked about ideological self-placement in two questions is ELE3198 (belonging to the block “Electoral surveys”), carried out in November 2017 and entitled “Pre-election of Catalonia. Regional elections of 2017”. In question 23, the measurement scale S9 (1–10) was used, already mentioned above. In question 30, the S8 scale (1–7) was used, offering 10 textual response alternatives (see Fig. 12). Once

		Scale S9 (1-10)										Don't know	No answer		
		1	2	3	4	5	6	7	8	9	10				
Scale S8 (1-7)	Extreme Left	76 (0,916)	5 (0,049)	1 (0,013)		1 (0,013)									83
	Left	364 (0,316)	225 (0,195)	329 (0,286)	109 (0,095)	66 (0,057)	11 (0,010)	8 (0,007)	21 (0,018)	8 (0,007)	2 (0,002)	6 (0,005)	2 (0,002)		1151
	Centre Left	48 (0,073)	43 (0,065)	172 (0,261)	195 (0,295)	147 (0,223)	26 (0,039)	16 (0,016)	16 (0,024)	16 (0,024)	2 (0,003)	1 (0,001)			660
	Centre	9 (0,017)	3 (0,006)	13 (0,025)	36 (0,068)	338 (0,640)	75 (0,142)	27 (0,051)	50 (0,030)	2 (0,006)	4 (0,006)	2 (0,004)	3 (0,006)		528
	Centre Right	2 (0,002)			2 (0,008)	45 (0,176)	58 (0,227)	77 (0,302)	50 (0,196)	8 (0,031)	13 (0,051)				255
	Right	2 (0,016)	2 (0,023)			11 (0,086)	9 (0,070)	25 (0,195)	29 (0,227)	16 (0,078)	34 (0,266)	1 (0,009)			128
	Extreme Right	2 (0,020)				1 (0,100)	1 (0,100)				6 (0,060)				10
	Don't know	3 (0,050)	2 (0,033)	1 (0,017)	4 (0,067)	16 (0,267)	1 (0,017)	4 (0,067)	3 (0,050)		2 (0,033)	19 (0,317)	5 (0,083)		60
	No answer	2 (0,044)	1 (0,023)	4 (0,065)		16 (0,336)	2 (0,044)	1 (0,023)	1 (0,023)	2 (0,044)	3 (0,067)	2 (0,044)	11 (0,244)		45
	None	4 (0,060)	2 (0,025)	3 (0,030)	3 (0,030)	49 (0,613)	1 (0,013)	2 (0,025)	2 (0,025)			9 (0,112)	6 (0,062)		80
		512	284	523	349	690	184	154	138	30	66	43	27	3000	

Fig. 12 Study ELE3198. Comparison of responses using the measurement scales S8 (1–7), text only, and S9 (1–10), numerical scale

again, the respondents (in this case of the autonomous community of Catalonia) appear to relate to the response options in both questions as would be theoretically expected: most of the responses are located on the “diagonal”. Specifically, 64% of the respondents who selected the “Centre” option placed themselves at number 5 on the 1–10 numerical scale, a circumstance that reinforces the hypothesis that regardless of whether the geometric centre of the scale is 5 or 5.5, the vast majority of respondents identify 5 as the central point on scales with a maximum value of 10.

8 Discussion of results

Analysis of the transfer matrices of these five studies, together with the results observed in Sect. 6, allows us to infer an important battery of results: (i) the absence of the “Centre” option increases the rate of non-response; (ii) a significant proportion of the respondents, who do not place themselves in any option when offered some text scales, systematically place themselves at 5 on the numerical scales, this value acting as a point of attraction for those who have no ideology or prefer not to label themselves; (iii) on the numerical scales 1–10, the Centre is located at 5, regardless of whether the real geometric centre is 5.5; (iv) when using scales 1–7, most of the respondents relate the number-text pairs as would be theoretically expected; (v) when the “Centre left” and/or “Centre right” options are not offered, the respondents tend to position themselves in more extreme options; (vi) when the wording of the question does not specify that 1 corresponds to “Extreme left” and 10 with “Extreme right”, but instead indicates “Left” and “Right”, the respondent from the left, and not extreme left, tends to place themselves at 1.

The list of results above raises other questions; such as is there a higher response rate in numerical scales? What response rate do text-only studies offer? And is this different to the studies which use number scales? At this point, analysis of the available data leads us to situate ourselves closer to the thesis of McRoy and Pancratz (2020) than that of Krosnick (1991), by observing higher response rates when numerical scales are used. Analysing the

1,467 studies in which the ideological self-placement question was asked and for which microdata were available, it can be seen that in the 12 where scales with only text were used, the aggregate response rate for the ideological self-placement question was 69.2% ($N=21,425$), when, in contrast, in the 1,455 studies in which a numerical scale was used, the aggregate response rate was 76.1% ($N=3,581,177$).

This comparison calls for us to look closer at the response rates, to study whether or not there are differences between response rates depending on the type of study or the type of scale used, where to make the computations, we have considered that a non-response occurs when the respondent chooses a response option outside of the response options of the Likert scale itself. On the one hand, the response rates by type of study are: (i) BAR (Barometers) 77.3% ($N=1,088,917$ in 402 studies); (ii) ELE (Electoral surveys) 80.1% ($N=929,089$ in 377 studies); (iii) ICC (Consumer Confidence Index studies) 81.7% ($N=243,825$ in 133 studies); (iv) OTE (Other studies) 70.6% ($N=1,056,203$ in 395 studies); and POL (Studies on political issues) 73.8% ($N=334,824$ in 164 studies). On the other hand, the response rates according to the type of scale used are: (i) 1–7 69.0% ($N=200,440$ in 41 studies); (ii) 1–10 76.4% ($N=3,315,484$ in 1378 studies); and (iii) 0–10 76.1% ($N=145,086$ in 43 studies). The other types of scale are present in too few studies for their rates to be comparable.

Considering the type of study, the figures for ICC, with 81.4%, and OTE, with 70.2%, stand out. The former always uses telephone surveys, while the latter normally collects information that is usually not perceived as related to political issues. These circumstances could be behind these results. In any case, a more detailed analysis of this issue would be necessary. However, considering the response rates according to the type of scale, the results seem to suggest that the possibilities of response increase with a greater number of options. The different moments in time in which both types of scale have been mainly used, however, means we cannot rule out that the explanation is something else.

9 Summary and conclusions

In the context of the measurement of ideology through the ideological self-placement of the respondents, this study identifies and analyses up to 20 different measurement scales in CIS surveys, grouping them into 6 groups according to the number of alternative responses available on the scale itself. The 20 scales within these 6 groups were identified based on whether the response options were numerical or only included text, and if they had other response options beyond “Don’t know” or “No answer”. The analysis was based on reviewing almost 2000 studies that since 1976 have been active in investigating the ideological self-placement of the Spanish population and have instigated the search for answers to a large number of hypotheses (questions), each one calling for more detailed consideration in potential future research studies.

The CIS, as well as many other institutions, is seen to favour the use of the scale from 1 to 10, defining the extremes as left/right. As has already been pointed out by, among others, Del Castillo (2004), on this scale 5 has been found to act as the effective centre of the scale, biasing the distribution. A large majority of respondents identify 5 as the centre of this scale despite being a scale without a defined central value. Trying to force people to choose 5 or 6 (centre-left and centre-right) hardly works. Many people choose 5 as effective centre of the scale in absence of labels and choose DK/NA (or other response

options) when 5 and 6 are accompanied by labels. This first solution produces a certain underestimation bias, whereas it also appears that labelling all the answer options can discourage self-placement of a proportion of the respondents. In general, however, as a rule, the relationships between political labels and numerical scores coincide with theoretically expected results.

In terms of response rate, no significant differences are observed between studies using 1–10 scales and those using 0–10 scales. Studies using scales 1–7, however, show significantly lower response rates. By type of study, we find that ICC studies obtain the highest response rates. This may be due to the method of conducting the interview, as these studies use telephone interviews.

In this study we have attempted to organise the enormous mass of data available in the CIS surveys in terms of ideological self-placement to answer general questions about how measuring political ideology. This has permitted to answer many relevant questions and to identify some other relevant questions that will be addressed in subsequent research. This includes questions such as the influence of the mode of administration of the questionnaire (by telephone, face-to-face or self-administered over the Internet) on the response rate, or the impact that the way in which the question is presented has on the distribution of self-placement. This study offers a common framework to address these questions as well as others, such as where do those who do not have an ideological stance place themselves, or how do levels of education and the scale in use affect the response.

In any case, in light of the analyses already carried out, we conclude that the most appropriate scale to use would be a 0–10 “enriched” scale. This is in line with the proposal of McRoy and Pancratz (2020) and the way ideological self-placement is measured in many countries and in some international surveys. This corresponds to a numerical scale characterised by having an odd and larger number of options. The odd number of options would allow to correctly represent the centre (symmetrical scale) and the wider scale would permit the respondents to better approximate their political ideology to a numerical value, distinguishing a certain degree of centrism/extremism. This scale would therefore be made up of 11 values in which there would implicitly be available 3 options for the centre, 3 options for the left and 3 options for the right, in addition to the values 0 and 10, which could be accompanied by “Extreme left” and “Extreme right”, respectively. This would avoid the possible confusion we detected in this study. These 11 response alternatives should be completed with, in addition to the traditional options of “Don’t know” and “No answer”, the option “Apolitical” or something similar.

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Data availability The data used in this paper is publicly available on the CIS database <www.cis.es>. Please see also the Supplementary Material.

Declarations

Conflicts of interest The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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