

ADOLESCENTS' MIDPOINT RESPONSES ON LIKERT-TYPE SCALE ITEMS: NEUTRAL OR MISSING VALUES?*

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Midpoint responses have two possible meanings: a true neutral meaning, and a meaning in the sense of 'undecided'. This article reports a longitudinal panel study of 1887 Dutch youths aged 12–24 years regarding the use and meaning of midpoint responses for 7 political attitude scales, each comprising a number of 5-point Likert items.

Younger adolescents use nonsubstantive responses more often, which reflects their level of political knowledge. These responses are also found to be involved in the vast majority of cases concerning change in political opinions. Finally, midpoint responses are more frequently a reaction to earlier 'don't know' responses, indicating that midpoint responses are used in the sense of 'undecided'.

THE MIDPOINT: MEANING AND IMPLICATIONS

The original meaning of the midpoint on a Likert-type item is neutral: 'neither agree nor disagree'. In political opinion research practice, however, it has been found to have many different meanings (Ryan 1980). These meanings can be summarized into two categories: (1) True neutral meanings besides 'neither/nor', such as 'neutral' and 'indifferent' (e.g. Presser and Schuman 1980, Ayidiya and McClendon 1990, Chen *et al.* 1995), and (2) meanings that refer more to a kind of nonresponse, such as 'undecided', 'don't know', 'never thought about it', and 'no opinion' (e.g. Schuman and Presser 1977, Tuohy and Stradling 1987, Gilgen and Barnholtz 1992).

Studies have shown that respondents—regardless of the actual description of the midpoint in the questionnaire—can also give both kinds of meanings to the midpoint. Thus, the midpoint is used more often if the response alternative 'don't know' is not offered (Lambert 1983), and if an explicit midpoint is offered, respondents give fewer 'don't know' responses (Presser and Schuman 1980, Ayidiya and McClendon 1990).

Because of this semantic ambiguity of the midpoint in political opinion research, midpoint responses (MPRs)—together with 'don't know' responses (DKRs) and missing item responses—have been termed 'nonsubstantive responses' (NSRs) (Francis and Busch 1975). A number of authors regard the extent to which respondents use these NSRs as an index of political knowledge or information (Francis and Busch 1975, Rapoport 1982, Althaus 1996).

Reviewing the research into the use of midpoint response categories, Krosnick and

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Fabrigar (1997) conclude that consistent and univocal results are lacking regarding its effects on the validity and reliability of survey measurement. The authors emphasize the need for further research into this question.

ADOLESCENTS AND THE USE OF NSRs AND MPRs

Numerous studies have shown that the actual use of NSRs varies for different categories of respondents. With respect to political items, women and respondents with low socio-economic status or low education generally respond more often with NSRs (e.g. Francis and Busch 1975, Converse 1976, Althaus 1996, Narayan and Krosnick 1996). These effects have been explained by referring to low levels of involvement with politics (e.g. Francis and Busch 1975, Converse 1976, Althaus 1996) or to satisficing, cognitive strain and informational overload (Krosnick *et al.* 1996, Narayan and Krosnick 1996, Schwarz *et al.* 1999).

Whichever explanation is given for the relatively abundant use of NSRs, in both cases a curvilinear age effect is to be expected: a systematic decrease in the use of NSRs from adolescence up to young adulthood, and an increase again for the older age groups, since research has shown that political involvement increases with adolescent age (Watts 1999) and decreases in the elderly (Jennings and Markus 1988). The same applies for the relation between age and cognitive-informational capacities (Neimark 1975, Flavell 1977). With adults, it has indeed been repeatedly demonstrated that the number of NSRs is larger for the older age groups (Ferber 1966, Francis and Busch 1975, Rapoport 1982, Schwarz *et al.* 1999). However, to our knowledge, detailed information about the use of NSRs through adolescence is lacking.

Younger adolescents can be expected to give more NSRs: more missing data, more responses in the sense of 'don't know' and 'no opinion', and more neutral responses. It may also be assumed that political opinions will be less stable in adolescence, since during this period young people are still engaged in forming opinions of their own: NSRs will increasingly be converted into substantive responses (SRs).

The use of MPRs could also be considered from the perspective of this general development of converting NSRs into SRs. MPRs could—as it were—represent a kind of 'quasi development' of NSRs into SRs: although the young people have not yet been able to form a definite opinion, they would like to give a genuine response (e.g. because they have become aware of the social undesirability of 'don't know' or missing responses). In this sense, MPRs are a continuation of DKRs with the connotation of 'undecided'.

RESEARCH QUESTIONS AND METHODS

The aim of this study was to investigate (i) whether the number of NSRs decreases with increasing age of adolescents, and (ii) whether young people's MPRs on Likert items may reflect nonresponses in the sense of 'undecided'.

SAMPLE

The data for this study were collected in a written panel survey, which is part of a large-scale panel survey: the Utrecht Study of Adolescent Development (USAD, Meeus and 't Hart 1993). The sample was drawn from a representative panel of 10,000 Dutch households. A maximum of three young people were randomly chosen from each of the investigated households: a maximum of one aged between 12 and 14 years, and a maximum of two between 15 and 24 years. This sampling method does not exclude a cluster effect due to the presence of siblings. All reported analyses were therefore repeated with only one—randomly selected—adolescent per household ($N = 1,592$), and this produced no significant differences in result statistics.

Respondents were approached in both September 1991 and September 1994. In 1991, 3,220 young people were successfully contacted. This sample may be regarded as representative with respect to gender, age, education, and religion of Dutch young people aged between 12 and 24 years who have native Dutch parents (see Meeus and 't Hart 1993). Of these 3,220 respondents, a total of 1,887 were again successfully contacted in 1994. The data reported here are from this latter group, the 1,887 respondents who filled in both questionnaires, so that data can be presented taking account of individual developments in response patterns.

Attrition analyses were conducted for all reported variables to examine whether the respondents who participated in both measurements differed from those who were not reached in the second measurement. The latter group were found to be older ($M = 18.9$, $SD = 3.5$ vs. $M = 17.8$, $SD = 3.7$; $t(3,218) = 8.93$, $p < .001$, $d = .32$). Their social class background was slightly lower ($\chi^2[4, N = 3,220] = 12.03$, $p < .05$, $\phi = .06$) and females were relatively overrepresented ($\chi^2[1, N = 3,220] = 16.79$, $p < .001$, $\phi = .07$). The higher mortality of the 'older', the female, and the lower class young people is not surprising, since they are more likely to have left home to live on their own, which increases the likelihood of losing track of them. The effect sizes of the differences are small, however, as can be read from the respective d and ϕ values. On all the other research variables (i.e. education, religion, political attitudes and the use of specific response categories) differences never reached either statistical (i.e. $ps > .05$) or substantive significance (i.e. $ds < .09$ and $\phi s < .05$).

POLITICAL ATTITUDE SCALES

Political opinions were measured using 7 scales made up of several items in the form of 5-point Likert scales. The opinions investigated concern three different domains: economics, socio-political freedom, and political intolerance. Together these three domains provide a reasonably complete picture of the total spectrum of political opinions in the Netherlands (Middendorp 1991). This study makes use of the responses to the 31 items of the 7 scales (a description of the scales and the English translation of scale items can be found in Vollebergh 1991 and Raaijmakers *et al.* 1998).

The response categories of the scale items were: (1) strongly agree; (2) agree; (3) neither agree nor disagree; (4) disagree; and (5) strongly disagree. For 29 of the 31

TABLE 1 Age differences in proportions of NSRs, DKRs and MPRs

	<i>Age in 1991</i>				<i>F</i> (<i>df</i> = 3, 1,883)	η^2
	<i>12-14</i> (<i>N</i> = 441)	<i>15-17</i> (<i>N</i> = 512)	<i>18-20</i> (<i>N</i> = 396)	<i>21-24</i> (<i>N</i> = 538)		
<i>NSRs</i>						
91	.47 _a	.36 _b	.30 _c	.29 _c	97.53*	.13
94	.34 _a	.29 _b	.28 _b	.28 _b	14.71*	.02
94-91	-.13 _a	-.06 _b	-.03 _{bc}	-.01 _c	35.76*	.05
<i>DKRs</i>						
91	.22 _a	.08 _b	.04 _c	.02 _c	203.25*	.25
94	.07 _a	.03 _b	.03 _b	.01 _b	36.51*	.06
94-91	-.16 _a	-.05 _b	-.02 _{bc}	-.01 _c	105.63*	.14
<i>MPRs</i>						
91	.23 _a	.27 _b	.25 _{ab}	.24 _{ab}	7.61*	.01
94	.26	.26	.25	.26	0.98	.00
94-91	.04 _a	-.01 _b	-.00 _{ab}	.01 _{ab}	7.29*	.01

Note. NSRs: Nonsubstantive responses (including missing item responses); MPRs: Midpoint responses; DKRs: Don't know responses. Means in the same row that do not have the same subscript differ at $p < .001$ (Scheffé). In italics: paired differences (94-91) with paired *t*-test, $p < .001$.

* $p < .001$.

items one extra response category was added: (6) haven't thought about it yet. Substantive responses (i.e. the item values 1, 2, 4, and 5) were coded in the direction of Conservatism, so that the values 4 and 5 always reflected conservative responses (denoted as SR+) and the values 1 and 2 reflected nonconservative responses (denoted as SR-).

RESULTS

EFFECT OF AGE

A number of analyses of variance were conducted to determine the effect of age (categorized into four age groups) on the proportion of nonsubstantive responses, both cross-sectionally and longitudinally. The results are reported in Table 1.

In 1991 the 12-14-year-olds used nonsubstantive responses (NSRs in Table 1) much more often than the 15-17-year-olds, who in turn gave this response more often than those aged 18 years and over. In 1994 these results were replicated, in that the 12-14-year-olds (in 1991) again gave more NSRs than all older adolescents, but the overall effect of age became much less important (from $\eta^2 = .13$ in 1991 to $\eta^2 = .02$ in 1994). Adolescents below the age of 18 showed a larger decrease in NSRs than young adults aged 18 and over, but the largest decrease was clearly shown by the adolescents aged 12-14 in 1991. A highly similar—though more pronounced—pattern was found for the use of don't know responses (DKRs in Table 1).

The pattern of age effects in the use of midpoint responses (MPRs in Table 1),

TABLE 2 Turnover table of item response pairs

<i>Item response pairs</i>		<i>Cell statistics</i>		
<i>1991</i>	<i>1994</i>	<i>Observed frequencies</i>	<i>Expected frequencies</i>	<i>Adjusted residuals</i>
DK	DK	622	165.90	37.74
	MP	1567	1341.70	7.49
	SR+	1884	2532.50	-18.90
	SR-	1109	1141.89	-1.16
MP	DK	420	462.37	-2.82
	MP	5773	3739.26	44.67
	SR+	5293	7057.97	-33.97
	SR-	2956	3182.40	-5.26
SR+	DK	428	813.83	-18.43
	MP	4300	6581.63	-43.79
	SR+	18895	12423.05	108.86
	SR-	1797	5601.48	-77.17
SR-	DK	365	392.89	-1.61
	MP	3200	3177.41	0.53
	SR+	1939	5997.47	-82.67
	SR-	6768	2704.22	99.83

Note: DK = don't know response; MP = midpoint response; SR+ = substantive response in direction of conservatism; SR- = substantive response in direction of non-conservatism.

however, was rather different. Here, no substantive age effects could be observed, although a small increase in the use of MPRs was demonstrated for the youngest age group (from .23 in 1991 to .26 in 1994; paired *t*-test: $t=3.60$, $df=440$, $p<.001$, $d=.24$). Thus, with the increase in adolescents' age the number of DKRs falls sharply, while for the adolescents aged up to about 15 years, this decrease is accompanied by a slight increase in MPRs.

ADOLESCENTS AND MPRs: 'NEUTRAL' OR 'UNDECIDED' RESPONSES?

Table 1 shows that the sharp fall in DKRs for the youngest adolescents (12-14 years) was accompanied by a slight increase in MPRs. This might perhaps be explained as follows. Adolescents who gave DKRs in 1991 first converted these responses into MPRs in the sense of 'undecided'; next, these 'undecided' responses were converted into substantive responses or, occasionally, true neutral responses.

The question is therefore whether these young people 'preferred' to convert DKRs in 1991 into MPRs in 1994. Whether they actually chose to convert DKRs into MPRs can be investigated by directly comparing the responses to the separate items over time. For each response category (DK, MP, SR+ and SR-) it is possible to investigate the extent to which the responses in 1994 differed from what might be expected on the basis of the total number of responses per category in 1991 and the proportions of those responses in 1994. Table 2 presents the results of this analysis.

For each separate item response pair both the observed and the expected frequencies are reported. The difference between observed and expected frequencies is reflected in the residual, and the adjusted residual (the standardized residual divided by an estimate of its standard error) is also presented in Table 2. Since this residual is normally distributed, with a mean of 0 and a standard deviation of 1, a positive value shows that the observed frequency was larger than might be expected on the basis of the marginal values, while a negative value indicates the opposite.

Inspection of the adjusted residuals permits three conclusions. First, very high positive values were obtained for those response pairs representing stability of opinion (i.e. DK/DK, MP/MP, SR+/SR+ and SR-/SR-). The stability of substantive responses (i.e. SR+ and SR-) was greater than the stability of nonsubstantive responses (i.e. DK and MP).

Second, the largest negative values were found in those response pairs representing a substantive change of opinion (i.e. from SR+ to SR-, and vice versa).

These results indicate that only a minority of the changes in responses reflected true substantive changes. Of the total of 57,316 item responses, 25,258 responses (=44.2 percent) were found to have changed between 1991 and 1994. Of these changed responses only 14.8 percent (i.e. $1,797 + 1,939 = 3,736$) actually involved substantive changes in the direction of political opinions.

The third conclusion concerns our main hypothesis, that MPRs may be used in the sense of 'undecided', and accordingly may reflect an undecided point in the development from DKRs to truly substantive responses. We argued that in changing their DKRs young people might initially 'prefer' MPRs to SRs. Even after three years this was found to be the case. The item response pair DK/MP was clearly more probable than the item response pairs DK/SR+ or DK/SR- (as indicated by the adjusted residual of +7.49 compared with -18.90 and -1.16, respectively).

It could be argued that the more probable conversion of DKRs into MPRs is solely due to the interchangeability of the two categories and does not really reflect any development in adolescents' political thinking. If this were the case, the conversion of MPRs into DKRs should be as probable as the other way around. However, this was clearly not the case (as indicated by the adjusted residual of -2.82 compared with +7.49).

CONCLUSION

This study demonstrates that MPRs can be a reaction to earlier DKRs. This is a clear indication that MPRs have two possible meanings: not only a true neutral meaning, occupying the middle position between two opposed substantive meanings, but also a meaning in the sense of 'undecided', by which the respondent indicates that he/she is not yet able to express a definite opinion, but would still like to give a genuine response.

The possibility of a double meaning of the midpoint—even when a separate 'don't know' category is offered—is not an argument for simply withdrawing these response categories. On the contrary, it is advisable for scales to include both a separate response category 'don't know' and a midpoint. Both responses can be regarded as an indication

of knowledge or involvement. Certainly in the case of measuring political opinions this information is essential, because—for example—it is associated with the respondents' willingness to express whether or not they hold political party preferences. It can also serve as an indication of the potential for change in opinions, since the change in opinions is often related to the shift from NSRs to SRs (see also Feldman 1989).

The possible double meaning of the MP has consequences for the value assigned to this response. In research practice up to now a choice has always been made between two alternative procedures. Either these responses are left out of the calculations, or the possibility of another meaning is ignored and the MP is scored as an entirely neutral standpoint. In the case of a true neutral meaning, scoring as the middle of the scale is useful. In the case of a meaning in terms of 'undecided', however, rating as a 'missing value' seems desirable. Since written surveys do not reveal the actual meaning attached by the respondent to the midpoint, a 'dualistic' approach is required, in which both values are simultaneously employed. Research is currently being conducted into the effects of such a dualistic approach.

This study again demonstrates that age has a massive effect on the use of NSRs. Among adolescents, the youngest give considerably more DKRs. As age increases, this number decreases, with a simultaneous increase in the use of MPRs. This finding reinforces the interpretation of the developmental pattern in the responses, in any case with such surveys of political opinions: from DKRs first, via MPRs in the sense of 'undecided', to substantive and true neutral responses.

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