

The Measurement of Cognitive Complexity and Its Relationship With Political Extremism

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Three studies tested the relationship between political extremism and cognitive complexity in an adult sample (N = 135), a sample of students (N = 145), and a sample of political party members (N = 47). According to value pluralism theory, advocates of extreme ideologies exhibit low levels of cognitive complexity. Context theory, in contrast, states that extremists think in a more complex and sophisticated way about politics. In accordance with context theory, significant positive correlations between cognitive complexity and extremist ideology were found in all samples. The results of these studies also revealed weak correlations among the cognitive complexity instruments used in previous research. Problems concerning the measurement of cognitive style and cognitive complexity are discussed.

KEY WORDS: authoritarianism, cognitive complexity, context theory, value pluralism model, political beliefs, rigidity

High complexity indicates that a decision-maker carefully weighs all the relevant perspectives on an issue and then integrates them into a coherent position. Low complexity, in contrast, indicates that only one viewpoint is considered, which is maintained with dogmatic tenacity. The pivotal role of cognitive complexity in political life has been demonstrated by ample research. For example, Tetlock (1983, 1984; Tetlock, Hannum, & Micheletti, 1984) observed significantly lower levels of complexity among politicians of minority parties than of majority parties. Complexity has also been related to competitive versus accommodationist political strategies in international disputes, such as the American-Soviet arms control talks and Arab and Israeli speeches in international forums (e.g., Suedfeld & Tetlock, 1977; Tetlock, 1988).

Moreover, complexity has been considered an individual trait that accompanies adherence to specific ideologies. In particular, ideological contents such as fascism (authoritarian personality theory; e.g., Frenkel-Brunswick, 1949; Rokeach,

1948) and left-wing and right-wing extremism (extremism theory; e.g., Tetlock, 1993), as well as a more or less moderate position (context theory; e.g., Sidanius, 1988), were hypothesized to be sustained by a simplistic cognitive style of information processing. However, there is a direct opposition between the predictions of extremism theory, which assumes high complexity levels among moderates, and context theory, which assumes low complexity among moderates. The present studies tested the contrasting predictions of both perspectives in three samples.

The Relationship Between Cognitive Complexity and Ideology

Tetlock (1983, 1984, 1986, 1993; Tetlock et al., 1984) conducted a series of studies on the relationship between political ideology and integrative complexity. Scores on integrative complexity were based on content analysis (Schroder, Driver, & Streufert, 1967) of public speeches (Tetlock, 1983; see also Tetlock et al., 1984), interviews (Tetlock, 1984), and written protocols (Tetlock, 1986). Integrative (or cognitive) complexity refers to two major structural characteristics: the degree of differentiation of cognitive elements, and the degree of integration or interrelatedness of these elements (e.g., Fransella & Bannister, 1977; Schroder et al., 1967; Wyer, 1964).

Tetlock assumed that both left-wing and right-wing extremists are more rigid and dogmatic and therefore would show less integrative complexity. The results of the first investigations, however, did not confirm this hypothesis completely. In some cases, the data confirmed the position of Adorno, Frenkel-Brunswik, Levinson, and Sanford (1950) that people with an extreme-right ideology are characterized by low levels of cognitive functioning (see Tetlock, 1983). In other cases, the initial expectations were favored (see Tetlock, 1984; Tetlock et al., 1984).

Tetlock formulated a value pluralism model to account for these inconsistencies. According to this model, one can identify a set of core values present in any ideology, and political topics may produce a conflict between them. The central hypothesis of value pluralism theory is that greater value conflict produces greater integrative complexity. In a study conducted in a student sample, Tetlock (1986) administered Rokeach's (1973) Value Survey and asked the participants to write down their thoughts about six political issues. These six political issues were chosen because the author expected them to lead to a conflict between a value pair in the Rokeach Value Survey. The results indicated that the individual's integrative complexity about these issues could be predicted from the importance ascribed to the value pair, as well as their conflict potential.

The degree to which a given political position is associated with complexity depends on the number of conflicting values a person with that position must engage when thinking about a given issue. In keeping with Rokeach's (1973) value theory, Tetlock (1993) argued that the center-left ideological position is characterized by the highest levels of value conflict. Advocates of center-left ideology ascribe high importance to the values of freedom and equality, whereas

advocates of other ideologies ascribe high importance to just one of these values. For the center-left adherent, these values often conflict with each other on important issues such as redistributive income policies, implying the reconciliation of economic freedom and social equality.

In contrast to value pluralism theory, context theory predicts that extremists exhibit superior cognitive performance. Extremists do not conform to societal positions and they withstand the modal pressure to which moderates give in. Extremists have, according to Sidanius (1984), “the following qualities among others: (1) relatively high field independence, (2) relatively high intelligence, (3) armed with a relatively large informational arsenal . . . and (4) relatively high stress tolerance” (p. 812).

Sidanius (1988) gave two reasons for the marked superiority of political extremists. First, because of high intellectual sophistication, extremists have more self-confidence and high self-esteem. They are more likely to deviate from societal norms than people with low self-esteem, who tend to avoid social censorship. Second, people who are more politically sophisticated have more political information in support of their opinions. According to Sidanius, there is a positive relationship between the extent of knowledge in support of an opinion and its extremity or polarization.

Two studies conducted by Sidanius (1978, 1988) addressed the hypothesis that extremists show higher levels of cognitive complexity. Cognitive complexity was measured by the political prediction test—a test developed by the author (see below)—in which the participant had to estimate the degree of political rioting and murder likely to occur on the basis of six items of information. Both studies supported context theory. Sidanius (1984, 1988) also reported greater political interest and information in extremists.

The Present Studies

Given the contrasting predictions of the two perspectives, the present studies sought to confront Tetlock’s and Sidanius’ theories about the relationship between political extremism and cognitive complexity. As has been pointed out by Durrheim (1997), the theories of Tetlock and Sidanius state that any relationship between cognition and particular ideological contents depends on the political context. Thus, the best way to compare the predictions of the two theories would be to test them within the same sample. Rather surprisingly, such a comparison was never attempted in previous research.

In addition, these theories are based on a rather limited empirical database. In particular, the work of Sidanius was based on samples of (Swedish) social science students, whereas Tetlock’s theory is primarily based on elite discourse. The present research therefore used samples of adults (Study 1), students (Study 2), and political party members, including extreme right-wing activists (Study 3). Study 3 is particularly interesting because previous studies on the relationship

between political ideology and cognitive complexity did not use a sample of true extremists. Nonetheless, because right-wing extremists have usually been considered especially low on complexity, their presence would provide a stringent test of context theory while enabling a comparison of the predictions of context theory and authoritarian personality theory.

Study 1

Two tests measuring cognitive complexity, used in previous research conducted by Tetlock and by Sidanius, were administered. As far as we know, no previous research has combined these methodologies. Sidanius (1984, 1988) also reported that extremists show greater information search and greater interest in politics. It would not be surprising that people who are more informed provide more complex written opinions on political issues. We therefore investigated the possibility that the relationship between cognitive complexity and political extremism is mediated by the fact that extremists are more informed and interested in politics.

Method

Participants and procedure. Participants ($N = 203$) were recruited by undergraduate students in the political sciences who asked their neighbors to participate so as to obtain a heterogeneous sample. Each of the 22 students was asked to collect 10 questionnaires. The sample consisted of 116 males, 72 females, and 15 persons who did not specify their gender; their mean age was 36.3 years ($SD = 12.5$). Of these participants, 128 had attended higher education, 54 had completed secondary education, 11 had left school at age 14, and 10 did not specify their education level. Most participants completed the whole questionnaire ($N = 135$); the others failed to provide full information on the cognitive measures.

A self-placement 9-point left/right scale was administered on which 43.5% of the participants endorsed a position on the left side (1 to 4) of the scale, 34% indicated a neutral stance (5), and 22.5% endorsed a position on the right side (6 to 9) of the scale. Most participants who checked the neutral point of this scale agreed with the programs of the Christian Democrat party and the Nationalist party, which represent the political center. These political parties are neutral in terms of the left/right dimension (for an overview of the political parties in Flanders, see Van Hiel & Mervielde, 2002). Hence, a neutral score does not imply a lack of interest in politics.

Comparison of the groups of participants who did and did not fill in the questionnaire completely revealed no significant differences regarding position (left, neutral, right) on the left/right self-placement scale [$\chi^2(3, N = 200) = 1.56, n.s.$]. Participants who completed the questionnaire had a significantly higher level of education [$\chi^2(3, N = 193) = 9.74, p < .05$].

Measures. Interest in politics was assessed by 9-point scales anchored by “very unimportant” and “very important.” The information scale (Cronbach’s $\alpha = .76$) consists of four items probing the degree to which the individual (1) ascribes high importance to getting recent information about politics, follows the daily news (2) on television and (3) in the newspapers, and (4) views weekly television programs on politics. The discussion scale (Cronbach’s $\alpha = .79$) consists of three items probing the degree to which the individual discusses politics with (1) friends, (2) relatives, and (3) colleagues.

As a measure of political ideology, participants expressed agreement with 25 items of the current political beliefs questionnaire (Van Hiel & Mervielde, 1996) on a 5-point scale anchored by “certainly disagree” and “certainly agree.” Ten of these items referring to general conservatism showed sufficient reliability (Cronbach’s $\alpha = .79$). We also asked the participants to rate on 9-point scales to what extent they agreed with the programs of the six major political parties. The first of two principal components extracted from the correlations among political party preferences was interpreted as a left/right dimension. High scores reflect agreement with the program of the extreme right-wing party and disagreement with the programs of the Socialist and Green parties. We constructed one aggregated left/right scale (Cronbach’s $\alpha = .83$) by summing the scores on the first principal component representing political preferences, the standardized scores on general conservatism, and the standardized scores on the self-placement left/right scale. Extremism was defined as the absolute value of the difference between the individual’s score and the median score.

Integrative complexity was derived from content analysis of freely written protocols (Baker-Brown et al., 1992). Integrative complexity is defined in terms of two variables: differentiation and integration. Differentiation refers to the number of characteristics or dimensions of a problem that are taken into account when considering an issue. When an individual thinks in good/bad terms, he or she clearly thinks in an undifferentiated manner. High differentiation occurs when a person views an issue from multiple perspectives. The complexity of integration depends on whether the individual perceives the differentiated characteristics as operating in isolation (low integration) or in multiple contingent patterns (high integration). The total complexity score is a combination of differentiation and integration and varies between 1 and 7. Examples of answers yielding complexity scores of 1, 3, 5, and 7 can be found in Appendix A.

Participants were asked to write down their opinions about four items of the current political beliefs questionnaire (Van Hiel & Mervielde, 1996). High-loading topics on different political belief factors were assessed to obtain a representative sample of different content domains. These topics were independency of Flanders, increased aid for Third World countries, less commitment to UN humanitarian actions, and tax increase on capital gains.

The answers of 50 participants to the first three items were analyzed by two independent coders. The correlation between the cognitive complexity scores

assigned by the two coders was quite satisfactory ($r = .81, .78, \text{ and } .83$, respectively). Conflict between coders was resolved through discussion. The answers on the fourth item (tax increase on capital gains) as well as the answers of the remaining participants were analyzed by one of the original two coders. Coders were blind to the participant's political position. Given the high intercorrelations among the cognitive complexity scores, we report an aggregated measure of integrative complexity by summing the scores on the four issues (Cronbach's $\alpha = .69$).

The political prediction test of Sidanius (1978) was developed as a measure of cognitive complexity. Participants had to estimate the degree of political rioting and murder likely to occur in unidentified countries on the basis of six items of information: equality of income, national wealth, public health expenditure, military expenditure, voting participation, and (6) proportion of minority groups. These judgments were made on a scale from 1 (very low) to 10 (very high), corresponding to the presentation of the stimulus information. The selected values for these six stimulus variables are related to the factual degree of political rioting and murder in the real world. Cognitive complexity is defined as the number of stimulus variables showing significant correlations with the predicted target variables. Thus, the greater the number of variables the participant takes into account to judge the target variables, the greater his or her cognitive complexity. Analogous to Sidanius (1978), we chose the 10% significance level as a cutoff point.

Results

Analysis of the relationship between cognitive complexity and political extremism. The correlations between political extremism and cognitive complexity measured by the content analysis method and the political prediction test are reported in Table 1. Contrary to the predictions of value pluralism theory, cognitive complexity measured by the content analysis method unexpectedly showed a positive relationship with the aggregated extremism dimension ($r = .24, p < .01$). The negative relationship between the political prediction test and extremism was also an unexpected finding that contradicts previous findings reported by Sidanius (predictions of violence and murder, $r = -.06, \text{ n.s.}, \text{ and } r = -.19$,

Table 1. Cognitive Complexity and Political Interest Variables: Correlations With Political Extremism and the Aggregated Left/Right Dimension

	Political extremism	Aggregated Left/right dimension
Integrative complexity	.24**	-.12
Predictions of violence	-.06	.12
Predictions of murder	-.19*	.08
Information scale	.18*	-.09
Discussion scale	.32***	-.08

* $p < .05$, ** $p < .01$, *** $p < .001$.

$p < .05$, respectively). In other words, both these results indicate that instruments that have been developed in the value pluralism tradition as well as in the context theory tradition contradict their parent theory.

Authoritarian personality theory (Adorno et al., 1950) predicts a negative linear relationship between cognitive complexity and right-wing ideology. However, no significant correlations between the cognitive complexity scores and the aggregated left/right dimension were obtained ($-.12 < r < .12$, n.s.).

Nonsignificant relationships between the scores on the political prediction test and cognitive complexity measured by the content analysis method were noted ($r = .04$ and $-.05$).

Analysis of the political interest variables. In line with the results of Sidanius (1988), a significant positive correlation between political extremism and the degree to which the individual gathers information about politics was found ($r = .18$, $p < .05$). We also obtained a significant relationship between political extremism and the degree to which the individual discusses politics ($r = .32$, $p < .001$).

Significant positive relationships were noted between cognitive complexity measured by the content analysis method and the degree to which the individual gathers information about politics ($r = .38$, $p < .001$) and discusses politics ($r = .28$, $p < .001$). No significant correlations were found between the scores on the political prediction test and the political interest variables ($-.15 < r < .16$, n.s.). These results cast serious doubts on the applicability of the political prediction test.

We also investigated the possibility that the relationship between cognitive complexity and political extremism is mediated by the fact that extremists are more informed and interested in politics. We looked at the partial correlation between complexity and extremism, controlling for the interest variables. The partial correlations remained significant for the cognitive complexity measure based on content analysis ($r = .17$, $p < .05$) and the prediction of murder ($r = -.17$, $p < .05$). These results indicate that political interest and complexity independently predicted extremism.

Discussion

These results show that cognitive complexity measured by the content analysis method is positively related to political extremism, whereas the political prediction test yields negative correlations. These rather paradoxical results contradict the previous findings of both Tetlock and Sidanius. Furthermore, nonsignificant correlations between the two instruments were noted. This result, of course, questions the construct validity of these cognitive complexity measures. Hence, one can make no assumptions about the predictive utility of their two parent theories.

This result is important because the previous research of Tetlock and Sidanius used a rather limited number of complexity measures. In particular,

to measure complexity, Tetlock used only the integrative complexity test of Schroder et al. (1967), whereas Sidanius administered only the political prediction test. Previous reviews and studies have amply demonstrated that more than one task should be used in measuring cognitive complexity (e.g., Fransella & Bannister, 1977; Hageseth, 1983; Vannoy, 1965; see also Grote & James, 1997). We therefore conducted Study 2, in which various operationalizations of cognitive complexity were used.

Study 2

The aim of this study was to provide an answer to two questions. First, do other instruments that measure cognitive complexity show relationships with those instruments we administered in Study 1? The inclusion of alternative cognitive complexity instruments may result in a clearer picture of what exactly is being measured by the content analysis method and the political prediction test. Second, is there a relationship between cognitive complexity and political extremism?

We administered the *Einstellung* problems (Luchins, 1942) and the cognitive complexity tests of Bieri (1955, 1966) and Scott (1962). Together with the instruments used by Sidanius and Tetlock, these measures are representative of five decades of theorizing about cognitive complexity in general, and in the realm of political psychology in particular. Factor analysis on these cognitive complexity measures should indicate whether they refer to one dimension or instead measure different aspects of cognitive complexity. Hence, the use of these “third party” measures not associated with either Tetlock’s or Sidanius’ theories provide an objective framework to interpret the exact nature of the integrative complexity test as well as the political prediction test.

Some authors assume that one reason for the inconsistent results reported in previous studies may be the fact that these measures, being devoid of social content, seem to generate task-specific responses that are unrelated to the social and political phenomena to which they are theoretically linked (e.g., Durrheim & Foster, 1997). Therefore, in the present study, all these instruments were adapted as much as possible to the domain of politics.

Method

Participants and procedure. The sample consisted of first-year psychology students ($N = 145$) who filled in the tests as part of the requirements for a course in methodology. Tests were administered in groups of 15 to 25 persons in a session of 1½ hours. The distribution of the scores on a 9-point left/right self-placement scale was as follows: 58% of the participants endorsed a position on the left side (1 to 4) of the scale, 29% of the participants indicated a neutral stance (5), and 11% of the participants endorsed a position on the right side (6 to 9) of the scale.

Moreover, half of the right-wing participants filled in a number (6) just next to the neutral point. Because of the low number of right-wing participants in this sample, we decided to exclude their data when analyzing variables related to political extremism. The present results were therefore limited to left-wing extremism.

Measures. Analogous to Study 1, we administered questionnaires measuring the political interest variables, political ideology, and the political prediction test. The reliabilities of the information scale and the discussion scale were comparable to those reported in Study 1 (Cronbach's $\alpha = .75$ and $.80$, respectively). The aggregated left/right scale showed sufficient reliability (Cronbach's $\alpha = .68$).

Integrative complexity was measured by asking participants their opinions about independency of Flanders and new political movements. The latter topic was included because it was of particular importance to the political situation. The answers of all participants to the two items were analyzed by three independent coders. The reliability of the cognitive complexity scores assigned by the coders was quite satisfactory (Cronbach's $\alpha = .86$ and $.81$, respectively). Conflict between coders was settled by discussion. The correlation between the scores on the two topics was rather modest ($r = .25$). Hence, in the following, the complexity score for each theme was analyzed separately.

The *Einstellung* problems (Luchins, 1942) involve presenting participants with a series of mathematical problems that can be solved with the use of a long solution. That is, using a fixed series of steps is the only way to solve the problem. The repeated presentation of these set problems leads to the automatization of the use of the long solution. The experimenter then presents one or more "extinction problems," which cannot be solved with the long method but only with a short, direct solution. Participants high in rigidity persist in trying to use the long method when it is inapplicable. Conversely, participants low in rigidity rapidly discover the short method. Examples of set and extinction problems are given in Appendix B.

Previous research (for an overview, see Christie, 1993) has shown that the largest differences between authoritarians and non-authoritarians in *Einstellung*-rigidity are obtained under conditions of ego-involving instructions. We therefore told the participants that this instrument was part of an intelligence test. Participants were tested individually in another room. Because two research assistants were involved in administering the Luchins test, we were able to test only 8 to 10 participants in each session. As a result, data from 61 participants were available. Scores of 14 participants were excluded because of arithmetic errors or because no automatization was obtained (see also Christie, 1993).

Bieri's (1955, 1966) test was the most popular instrument during the 1960s to measure cognitive complexity. The test was developed in the context of person perception. The participant assigns for each "object" (i.e., a person) a number from -2 to 2 on several "constructs" (i.e., personality dimensions). According to Bieri, individuals high in cognitive complexity show more diversification in scoring these objects on the dimensions. The ratings are compared element by

element for each pair of rows. Whenever there is exact agreement between ratings, a score of 1 is given. The more agreement, the higher the score and the lower the degree of cognitive complexity. These scores were reversed so that high scores reflect high complexity.

Some adaptations to this test were made. First, instead of using bipolar dimensions, unipolar scales were presented to obtain a format similar to the other parts of the questionnaire. Second, political parties and items that were part of the current political beliefs questionnaire (Van Hiel & Mervielde, 1996)¹ were used as objects and dimensions.

Scott's (1962) measure of cognitive complexity is based on an object-sorting task in which the participant must place 28 countries in meaningful categories. Each country may belong to one or more categories. Participants are asked to use categories that have political relevance. Whenever nonpolitical categories were used, the data were excluded from further analyses. Cognitive complexity is defined as the dispersion of these countries over the set of distinctions yielded by the category system. Dispersion is calculated with a formula based on information theory.²

Results

Structure of the cognitive complexity measures. Data from 39 participants were excluded because they failed to complete adequately at least one of the cognitive complexity tests. Many participants failed to fill in the open answers ($N = 20$) and Scott's cognitive complexity test ($N = 19$). Only two participants did not complete Bieri's cognitive complexity test. All participants completed the political prediction test. High scores on these instruments indicate high levels of cognitive complexity. Analogous to previous research (e.g., Fransella & Bannister, 1977; Vannoy, 1965), rather weak correlations among the cognitive complexity scores on the diverse instruments were noted (see Table 2).

We used the principal-axis factoring method to extract principal components from the correlations among the cognitive complexity scores. This method takes into account the commonality of the measures, which should be expected to be rather low given the weak correlations between the measures. Component extraction was followed by oblimin rotation. The first two components accounted for 20.54% and 11.51% of the variance. As shown in Table 3, the political prediction scores loaded on the first dimension. The second dimension consisted of the scores on Bieri's and Scott's cognitive complexity measures and the integrative complexity measures. These dimensions were statistically independent ($r = .03$, n.s.).

¹ Examples of such items are "Tax increase on capital gains" and "Increased aid for Third World countries."

² Complexity = $H = \log_2 n - [1/n \sum [n_i \log_2(n_i)]]$, where n is the total number of countries, n_i is the number that appear in a particular combination of groups.

Table 2. Intercorrelations Among the Cognitive Complexity Scores in Study 2 and Study 3

	Pr. violence	Pr. murder	Compl. Bieri	Compl. Scott	Integr. theme 1	Integr. theme 2
Pr. violence	—	.46	-.04	.02	-.01	.06
Pr. murder	.10	—	-.14	.08	.20	.01
Compl. Bieri	-.13	.05	—	.14	.07	.08
Compl. Scott	N.A.	N.A.	N.A.	—	-.01	.20
Integr. theme 1	.07	-.14	-.23	N.A.	—	.25
Integr. theme 2	.01	.14	-.11	N.A.	.46	—

Note. The cognitive complexity tests were fully completed in Study 2 and Study 3 by 106 and 45 participants, respectively. Correlations obtained in Study 2 and Study 3 are shown above and below the diagonal, respectively. N.A., not administered; Pr. violence, predictions of violence; Pr. murder, predictions of murder; Compl. Bieri, scores on Bieri’s cognitive complexity test; Compl. Scott, scores on Scott’s cognitive complexity test; Integr. theme 1 and 2, integrative complexity on the first and second theme, respectively.

Table 3. Factor Structure of the Cognitive Complexity Scores in Study 2

Complexity measure	I	II
Predictions of murder	.98	.07
Predictions of violence	.45	.05
Bieri’s complexity test	-.14	.18
Scott’s complexity test	.02	.27
Integrative complexity—theme 1	-.03	.71
Integrative complexity—theme 2	.12	.32
Eigenvalue	1.21	0.72

Note. Loadings greater than .30 are in boldface.

The scores on the *Einstellung* problems were not included in the factor analysis because of the low number of observations. Correlations between the time to solve the two extinction problems and the factor-analytical dimensions did not reach the traditional significance levels ($-.27 < r < -.11, N = 42$). Moreover, no significant relationships were found between scores on the *Einstellung* problems and political extremism.

Analysis of the relationship between cognitive complexity and political extremism. The correlations between political extremism and the cognitive complexity measures are reported in Table 4. We calculated one complexity score by summing the murder and violence component for the political prediction test and summing the scores on the two themes for integrative complexity. These results are comparable to those found in Study 1. A low correlation between political extremism and the score on the political prediction test ($r = .06, n.s.$) was noted. A significant relationship was found between political extremism and the scores on Bieri’s test ($r = .22, p < .05$), as well as a near-significant relationship for the

Table 4. Correlations Between the Cognitive Complexity Measures and the Political Interest Variables and Political Extremism (Study 2)

	Political extremism	Information scale	Discussion scale
Political prediction test	.06	.06	-.04
Integrative complexity	.16	.23*	.19*
Bieri's test	.22*	.32**	.17*
Scott's test	.02	.15	.11

* $p < .05$, ** $p < .01$.

integrative complexity scores ($r = .16, p < .10$). No such correlation was obtained for Scott's cognitive complexity measure ($r = .02, n.s.$).

Analysis of the political interest variables. The results on the political interest variables were strikingly consistent with those found in Study 1. A significant positive correlation was found between political extremism and the degree to which one gathers information about politics ($r = .21, p < .05$) and discusses politics ($r = .24, p < .01$).

We obtained meaningful relationships between the scores on integrative complexity and Bieri's test on the one hand, and the degree to which the individual gathers information about politics ($r = .23, p < .05$ and $.32, p < .01$, respectively, $ps < .05$) and discusses politics ($r = .19$ and $.17$, respectively, $ps < .05$) on the other hand. No such significant correlations occurred for the scores on the political prediction test and Scott's test ($rs = .15$).

Finally, we investigated the possibility that the relationship between cognitive complexity and political extremism is mediated by the fact that extremists are more informed and interested in politics. The partial correlation controlling for the interest variables curbed the strength of the relationship between integrative complexity and political extremism ($r = .13, n.s.$). This relationship remained significant for Bieri's cognitive complexity measures ($r = .21, p < .05$). The latter result thus indicates that political interest and complexity independently predicted extremism.

Discussion

Analogous to Study 1, the results were generally consistent with context theory. The weak correlations among the cognitive complexity tests basically revealed that these tests did not measure the same complexity construct. The underlying structure of these measures consisted of one dimension with high loadings for the two parallel measures of the political prediction test, and a second dimension representing the two integrative complexity measures. As attested by the weak correlation between these two dimensions, the integrative complexity

test and the political prediction test were hardly related. Also analogous to Study 1, the content analysis method was related to the political interest variables, whereas the political prediction test failed to show such correlations.

The political prediction test did not show the expected relationship with political extremism, and it showed poor correlations with the political interest variables. These results shed further doubt on the construct validity of the political prediction test.

Study 3

The characteristics of political extremists have been the subject of fierce debate since the 1950s (e.g., Eysenck, 1954, 1981–1982; Ray, 1983; Stone, 1980). This debate, however, is one for which hardly any empirical data are available. According to Stone and Smith (1993), many political psychologists “typically base their case on intuitive evidence . . . concerning apparent similarities between regimes of the far left and far right, rather than on a systematic review of the empirical data on any personality and ideology” (p. 154). Other research explicitly designed to investigate the relationship between cognitive style and political extremism can also be criticized. Most of these studies were conducted with social science students, and few of them have used samples more or less representative of the electorate. It thus seems quite premature to generalize findings from these samples to political party members or to true extremists.

However, many authors have taken it for granted that these studies were indicative of the personality profile of political extremists. One of the consequences of this “research tradition” is the lack of data on “real extremists,” with the exception that some studies have found right-wing extremists to exhibit higher degrees of authoritarianism (see Meloen, 1993) and dogmatism (see Stone & Smith, 1993). To our knowledge, other personality measures have not been used in extremist samples.

In Study 3 we tried to confirm the relationship between cognitive complexity and political ideology in a sample including “true” extremists. Members of an extreme right-wing political party ($N = 24$) and moderate political parties ($N = 23$) completed the cognitive complexity tests. Right-wing extremists were supporters of the Vlaams Blok, a party that is similar to parties such as the Centrum Partij in the Netherlands, Le Pen’s Front National in France, and the Republikaner in Germany (Ignazi, 1992). The key political message of these parties is one in which anti-immigrant issues clearly dominate. Moreover, these political parties have been unambiguously labeled “(neo-)fascist” by Meloen (1997, p. 652; Meloen, Van der Linden, & De Witte, 1996). Members of the Christian Democrat party ($N = 7$) and the Nationalist Democrat party ($N = 16$) are considered moderates. That is, these parties do not have a left-wing or right-wing profile but are neutral on this dimension (for an overview of these parties, see Van Hiel & Mervielde, 2002).

Method

Participants and procedure. Forty-seven participants whom undergraduate students in the political sciences knew to be political party members were recruited at home. The sample consisted of 35 men and 12 women; the mean age was 34.3 years ($SD = 14.5$). Most of these participants attended higher education ($N = 33$). Correlations between these demographic variables and the aggregated left/right dimension were not significant ($-.10 < r < .14$, n.s.).

Measures. Unlike Study 2, the 9-point left/right self-placement scale, the political interest variables, the *Einstellung* problems, and Scott's cognitive complexity test were not administered. The remaining measures used in Study 3 are completely analogous to Study 2.

Integrative complexity was measured by asking participants their opinions about independency of Flanders and new political movements. The answers of all participants to the two items were analyzed by the three independent coders who also served as coders in Study 2. Participants also completed the political prediction test (Sidanius, 1978). For assessment of Bieri's (1955, 1966) complexity measure, participants also assigned for each political party a number from 1 to 5 on several items of the current political beliefs questionnaire (Van Hiel & Mervielde, 1996).

The aggregated left/right scale consisted of the sum of the scores on the first principal component representing political preferences, and the standardized scores on general conservatism (Cronbach's $\alpha = .84$).

Results

Most participants completed all cognitive complexity tests ($N = 35$). Analogous to Study 2, rather low correlations among the cognitive complexity scores on the diverse instruments were noted (Table 2). These findings thus confirm the results obtained in Study 2. Note, however, the perplexing result that unlike Study 2, Bieri's cognitive complexity measure showed negative relationships with the scores on the integrative complexity test.

A nonsignificant relationship was noted between political extremism and the political prediction test ($r = .17$, n.s.). A significant positive relationship between political extremism and the integrative complexity measure was noted ($r = .33$, $p < .05$). Finally, the scores on Bieri's cognitive complexity test correlated negatively with extremism ($r = -.28$, $p < .10$).

Discussion

Analogous to Studies 1 and 2, we obtained positive correlations between cognitive complexity and (right-wing) extremism. Unlike Study 2, however, Bieri's cognitive complexity test was negatively related to the integrative complexity

scores. Although this line of reasoning is admittedly speculative, these strikingly divergent results might be explained by the fact that Bieri's test was developed within the realm of person perception. That is, high complexity in person perception might be understood in terms of differentiating people along several personality dimensions, whereas complexity in the political realm might be considered as perceiving political issues according to *one* dimension (i.e., attitude constraint; Converse, 1964). Given the fact that political activists are highly acquainted with politics, greater attitude constraint would be accompanied by less differentiation. Conversely, the students participating in Study 2 may be considered to be generally unacquainted with politics. The least knowledgeable students might respond with a 3 to most items because they do not sufficiently know the programs of the political parties, whereas the more knowledgeable students may differentiate between political parties and hence would be likely to obtain higher Bieri scores. In sum, beyond a given level of political knowledge, increases in knowledge may constrain the Bieri scores, whereas below this point, there may be a positive correlation between political knowledge and the Bieri scores.

General Discussion

Our results yield two important conclusions. First, they confirm the predictions of context theory in showing that political extremists have higher levels of cognitive complexity. This conclusion has high generalizability because it was replicated in an adult sample, a student sample, and a sample of political party members in which "true" extremists were present. Extremists also showed greater interest in politics; Studies 1 and 2 revealed that when political interest was statistically controlled for, the relationship between extremism and complexity remained significant. Second, the results revealed weak correlations between the scores on the integrative complexity test and the political prediction test. Nor were these tests significantly related to other measures of cognitive complexity. Hence, these results shed some doubt on the validity of these measures as well as on the conclusions based on them. These doubts are especially pertinent with respect to the political prediction test because, in contrast to the integrative complexity test, this test did not show meaningful correlations with the political interest variables.

Relationship Between Cognitive Complexity and Political Extremism

Our results indicate greater cognitive complexity and interest in politics among right-wing extremists. To our knowledge, only the present research and the studies conducted by Sidanius (1984, 1988) have shown greater cognitive complexity and interest in politics among right-wing extremists. Note, however, the inconsistency between our findings and those of Sidanius with respect to the political prediction test.

Moreover, our results for the integrative complexity test are strikingly inconsistent with the findings of Tetlock (1983, 1984). The samples used in these studies may provide a partial explanation for these inconsistencies. Tetlock studied the relationship between cognitive complexity and political ideology in quite remarkable political elite samples: the U.S. Senate and the British House of Commons. Although some authors have stressed the importance of cross-sample stability of relationships found in political psychology (e.g., Brown, 1965), no attempts have been made to extrapolate these results to a public of potential voters.

It has also been argued that right-wing elites prefer repetition of simple messages rather than complex speech (Reicher, 1996). However, preference for a simple rhetorical style does not necessarily imply simple cognitions about politics (Tetlock et al., 1984). Because the studies conducted by Tetlock are based on oral conversation, it is possible that some form of rhetoric has been measured. This could be particularly true in the studies of Tetlock (1983) and Tetlock et al. (1984), in which segments of public speech were analyzed. The mean level of cognitive complexity in these two studies versus the present study is another indication of these differences in the assessment of complexity. In the former studies, mean levels of cognitive complexity were rather low ($M = 2.23$ and 2.22 , respectively),³ which suggests that political elites show moderate or high differentiation but no integration. One would, of course, expect much higher levels of integrative complexity among policymakers. Although the present sample of political party members could be expected to be less complex than the samples Tetlock studied, a higher mean level of integrative complexity was found ($M = 2.85$). Hence, these results suggest that written protocols reveal greater complexity than oral conversation.

Finally, in a re-analysis of Supreme Court decisions, Gruenfeld (1995) reported that Tetlock's conclusions were an artifact. In analyzing the court data over a broader range of conditions, she showed that the critical factor was whether justices were communicating a minority or a majority opinion. Moreover, Gruenfeld showed that minority communications were less complex than majority messages, even when given by the same individuals. Gruenfeld's study thus shows that situational factors may have huge effects, but it cannot explain the direction of the present results. That is, in Flanders—as well as in other parts of western Europe—extreme parties are almost by definition minority parties; hence, on the basis of Gruenfeld's (1995) findings, one would expect that their members would exhibit lower complexity, which contradicts our findings.

The confirmation of context theory in the present studies might be explained by the Flemish political context. Tetlock and colleagues' studies were based on legislative discourse in the United States and Britain—countries that clearly have two major political parties. Sidanius confirmed context theory in Swedish

³ Mean levels of cognitive complexity in Tetlock (1984) could not be calculated because numbers of participants in each ideological group were not reported.

samples, and in Sweden as well as in Flanders, many political parties are situated in the political center. It is possible that the presence of a political center that is broad in terms of numbers of adherents and politics, but narrow in terms of ideas and differentiation, may cause the conformist centrist pull described by Sidanius. This narrowness of ideas might even be exacerbated by the fact that political parties such as the socialists and conservatives that once were more "ideological" have been moving toward a centrist position. Such a race toward the center has been observed not only in Flanders, but also in other western European countries (e.g., Labour in Britain and the SPD in Germany). Hence, if this tendency becomes stronger in the future, cognitively complex individuals might be more likely to adhere to extremist ideologies.

Measurement of Cognitive Complexity

Because we wished to determine whether different approaches are measuring the same complexity dimension, we emphasized the diversity of instruments measuring cognitive complexity. However, because our results show that more than one dimension is implied, additional research on the relationships among cognitive complexity dimensions is definitely needed.

It has been repeatedly argued that our understanding of cognitive style would be advanced through the use of factor analysis (e.g., Royce, 1973; Vernon, 1973; Wardell & Royce, 1978; Wolitzky & Wachtel, 1973). Despite these calls for factor analytic studies, little empirical effort has been made to establish stable, replicable cognitive style dimensions. Moreover, too many investigators have relied on just one task to assign participants to positions along a particular cognitive style dimension (Wolitzky & Wachtel, 1973). This has led to a situation in which there is hardly any integration of findings in the realm of cognitive style research.

The study of cognitive complexity is not an exception to this situation. First, although many studies (e.g., Hageseth, 1983; Vannoy, 1965; Vernon, 1973; Wyer, 1964) attest to the multidimensionality of cognitive complexity, an empirical framework that allows for more specific cognitive complexity dimensions is not available. Second, participants are often assigned to a position along a cognitive complexity dimension on the basis of one test. Third, to make things even worse, low intercorrelations among tests assessing cognitive complexity were repeatedly found (e.g., Fransella & Bannister, 1977; Hageseth, 1983; Vannoy, 1965; see also Grote & James, 1997). Also, the weak intercorrelations among a representative sample of cognitive complexity measures in the present studies indicate that the cognitive complexity concept has been operationalized in a broad and polymorphous way.

Why were the correlations between the political prediction test and the other complexity tests so weak? This question might be illuminated by the fact that complexity tests have been described in terms of differentiation and integration. It is possible that the political prediction test primarily refers to integration

because it measures the use of diverse criteria in making a prediction. In contrast, the integrative complexity test might be primarily understood in terms of differentiation. That is, Tetlock's test often yields scores of 3 or less, whereas integration only starts to play its role on the second level of complexity for scores of 5 and more. Thus, most of the variability in these complexity scores can be attributed to differentiation. Moreover, the other measures used in our studies also seem to primarily tap the differentiation aspect. Fransella and Bannister (1977) identified Bieri's complexity test as a measure of cognitive differentiation—not integration. The differentiation of a greater number of categories also leads to higher complexity scores on Scott's test (Van Hiel & Mervielde, in press). In sum, the political prediction test can be considered as a measurement of the integration aspect, whereas the other tests can be understood in terms of differentiation.

Nonetheless, the study of the exact nature of cognitive complexity and the cognitive processes associated with it are important goals for future research (e.g., Furnham, 1995; Sternberg & Grigorenko, 1997). Progress in our understanding of cognitive complexity would catalyze our knowledge about its relationship to political extremism.

APPENDIX A: Examples of Answers Scored on Tetlock's Measure of Complexity

Scores of 1 indicate no evidence of either differentiation or integration:

“I do not agree with the opinion that Flanders should be independent. Belgium is too small as a country in order to manifest itself.”

Scores of 3 indicate moderate or even high differentiation, but no integration:

“Flanders is too small a country to manifest itself in Europe. Continued federalization, though, may give extra opportunities to Flanders with respect to our social security system.”

Scores of 5 indicate moderate or high differentiation and moderate integration:

“I do not agree with this thesis. Solidarity among Flemish and Walloon people, as well as with immigrants living here, makes us stronger and enriches our culture. Independency is only advantageous to those in power and divides the people. Independency also opens the road to fascism (see Yugoslavia) and civil war.”

Scores of 7 indicate high differentiation and integration:

“Independency of Flanders would improve the quality of government. Flanders would also benefit economically from independency, and it would be easier to communicate our political situation abroad. I guess

that these changes would also prevent us from being further exploited by Walloon government. But, Walloon people would benefit from independency as well as they will quickly recognize the problems of their policies. They then will be surely able to rationalize their own policies.”

Scores of 2, 4, and 6 represent transitional levels in conceptual structure.

APPENDIX B: Examples of Einstellung Problems

Set Problem

Given: Containers of capacities 61, 31, and 12 quarts.

Obtain: 6 quarts.

Solution: Fill the bottle that holds 61 quarts; from it fill the 31-quart bottle; from the remainder, fill the 12-quart bottle twice. In short, $61 - 31 - 12 - 12 = 6$.

Extinction Problem

Given: Containers of capacities 17, 54, and 6 quarts.

Obtain: 23 quarts.

Solution: The long solution is $54 - 17 - 6 - 6 = 25$, which does not yield the desired outcome. However, filling the 17- and 6-quart bottles and pouring them into the 54-quart bottle is a short, direct solution ($17 + 6 = 23$) that yields the desired outcome.

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