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CONSERVATISM AS A PREDICTOR OF RESPONSES TO HUMOUR-I. A COMPARISON OF FOUR SCALES.

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Summary- Four conservatism questionnaires (C-Scale; Wilson and Patterson, 1970; POI; Eysenck, 1976; MK; Cloetta, 1983; 16PF-Q1, Schneewind, Schröder and Cattell, 1983) were compared with regard to their ability to predict responses to humour based on the incongruity-resolution structure. We further investigated, whether a prediction of humour responses could be improved by assessing variables like toughmindedness, capitalism, rigidity and intolerance of ambiguity. The results showed that the conservatism scales overlap in their prediction of funniness of incongruity-resolution jokes, sex jokes and rejection of nonsense jokes. Correlations with the other humour scales were specific for certain conservatism questionnaires. A canonical correlation analysis relating the humour scores and the conservatism scales yielded three significant correlations ($rc_1=0.65$, $rc_2=0.51$ and $rc_3=0.44$). Capitalism was also related to appreciation of incongruity-resolution jokes and of sex jokes. The previously found effects of intolerance of ambiguity could be replicated.

INTRODUCTION

Despite nearly a century of psychological research on humour the phenomenon still has not revealed its last secrets. About 80 yr ago, in 1905, Freud's book *Der Witz und seine Beziehung zum Unbewußten* was originally published. Although not being the first, his ideas about the comic, jokes and humour dominated investigations of psychologists and psychiatrists until recently. However, his model also was criticized and much experimental evidence has been gathered since then favouring alternative views and models. Nowadays humour research has overcome Freudian thinking and a variety of new ideas have been adopted and empirically tested. But despite the increased interest in experimental research on humour during the last two decades more questions have arisen than have been answered. We still do not know the basic mechanisms underlying humour and laughter.

One question has attracted psychologists since the beginning of humour research. What are the variables that determine the type of humour one acquires? What are the causes for interindividual differences in sense of humour? The hypothesis that an individual's humour and his personality are interwoven was set up very early.

Among other variables (e.g. extraversion, intelligence, aggressiveness, anxiety) conservatism was assumed to be affiliated with preference for certain types of humour. The categories of humour that were expected to be correlated with conservatism have changed during the years. Murray's (1934) early study revealed a correlation between a Conservative-Radical (C-R) Sentiments Test and disparagement jokes. About 40 yr later a set of investigations was carried out by Wilson and coworkers (e.g. Wilson, 1973b; Wilson and Brazendale, 1973; Wilson and Patterson, 1969). Wilson and Patterson (1969) postulated a dimension 'formal vs libidinal' jokes and predicted that conservatives (with 'chronically mobilized inhibitions') will show a preference for the former type of jokes (e.g. puns, incongruity) while disliking the latter (sick and sex jokes). Later research focused on risqué sex jokes and led to the conclusion that

"...subjects scoring high on anti-hedonism (are) showing a particular dislike for jokes referring to intercourse and sex organs but significantly appreciating jokes about urination and pregnancy relative to Ss scoring low on anti-hedonism." (Wilson, 1973b, p. 181)

Wilson's results got support from Thomas, Shea and Rigby (1971) using a non-reactive technique but not from Askenasy (1976). In a study by Chapman and Gadfield (1976) an analysis of single correlations showed that there are positive as well as negative and non-significant relationships between sex jokes of different themes and conservatism.

Recently, another hypothesis has been set up, relating conservatism to the structure of jokes rather than to their content (Ruch, 1981, 1984; Ruch and Hehl, 1983d). Conservatism is thought to be the general factor determining appreciation of one type of joke, which is different in content but homogeneous in structure. The new hypothesis stresses the similarity between the mode of procession of jokes, other humorous material and Wilson's (1973a) 'dynamic theory of conservatism'. A similar mechanism, i.e. a characteristic tendency to cope with uncertainty (in sense of information theory), underlies conservative attitude as well as appreciation of humour. The new hypothesis is based on the differential psychological implications inherent in current models of humour. Conservatism is theoretically linked with parameters in humour regarded as fundamental by many humour theorists.

We will first discuss some models of humour and then present our own approach to humour, linking various categories of humour to conservatism and to related variables.

MODELS OF HUMOUR

Many variables are discussed in contemporary humour research. Researchers agree that all stimuli we consider funny have incongruent elements. Incongruity is defined as "... a conflict between what is expected and what actually occurs in a joke" (Shultz, 1976, pp. 12-13).

Some investigators (Nerhardt, 1976; Rothbart, 1973) postulate that incongruity alone is sufficient to produce humour. Others claim that the incongruity also has to be solved in order to understand or 'get' the joke (Shultz, 1972; Suls, 1972). One model became known as the 'two-stage' model or 'incongruity-resolution' model of humour. According to this model all the information in the joke body is congruent up to the point where the punchline has to be processed. The punchline is unpredictable and in contrast to the joke body. This incongruity can be solved by finding a 'cognitive rule' (Suls, 1972) which makes the joke ending predictable by the joke body.

Which of the two models, the 'incongruity-resolution' model or the model based on incongruity alone, is more appropriate is still under discussion. Factor analytic investigations (Ruch, 1981, 1984) carried out in Austria and Germany using different samples of jokes and cartoons showed that there are three stable dimensions in sense of humour. In these analyses Ss had to rate between 48 and 120 jokes and cartoons on several 7-point rating scales. Some samples were very homogeneous (e.g. students, patients with special psychosomatic disorders); some were fairly representative. A three mode factor analysis showed that the ratings used were two-dimensional, and therefore the two most typical representatives ('Funniness' and 'Rejection') were used in further studies.

The humour dimensions extracted seem to have a close relationship to the two models described above. Factor 1 contains jokes and cartoons with incongruities that ought to be resolved. This factor supports Suls' model and was therefore labelled the 'incongruity-resolution' type of humour. Probably this factor can be related to the arousal boost-jag hypothesis (Berlyne, 1972). Factor 2 was called 'nonsense' or 'absurd' jokes. Humour of this type (mostly cartoons) is based on the moment of surprise. These incongruities cannot be resolved or their resolution brings new incongruities. On the whole they remain absurd or

incongruent. Rothbart and Pien (1977) have described the structure of these jokes at the Welsh Conference on Humour. A good description of this factor might also be "... pure or unsolvable incongruities" (Shultz, 1976).

The third factor contains all sex jokes and only sex jokes. They can be based on either the incongruity-resolution or the nonsense structure. This is also confirmed by their double loadings on the first or the second factor. So if we speak of sex jokes we have to distinguish whether we speak of incongruity-resolution sex jokes or of nonsense sex jokes.

Our results show that we should not look for a general model of humour. On the contrary, we should distinguish at least two kinds of humour, one in which the solubility of the incongruity is important and one in which the incongruity is sufficient. These seem to be the major dimensions of humour. Suls (1983), in a recent survey of the literature, comes to the same conclusion. Additionally, if a common salient feature of some jokes becomes dominant, then it can be separated from the major dimensions to form its own category, as has been done with sex jokes in our case. We have studies in progress that will try also to take into consideration other salient features; but the jokes presented are based on either the one or the other structure.

THE SENSE OF HUMOUR INVENTORY (3WD)

The next step was to construct inventories that can measure these three factors. Two short alternative forms and a longer one are available. The shorter forms (3WD-A, 3WD-B) consist of 35 jokes (verbal jokes and cartoons) each; 5 jokes are for 'warming-up', and 10 jokes are for each of the three factors. These parallel forms can be employed for testing reliability and for multiple measurements, because repetition of the same humour test may not be indicated. The longer form (3WD-K) consists of 15 jokes for each factor, and again 5 jokes for 'warming up'. Ss rate each joke for 'funniness' (not funny vs very funny) and degree of 'rejection' (no rejection at all vs strong rejection) on two unipolar 7-point rating scales. Therefore the forms provide six scores; three for funniness of incongruity-resolution, nonsense and sex jokes and three for their rejection. The Rejection scale represents the negative emotions (e.g. painfulness, anger, indignation, disgust) inducible by jokes. It turned out that the corresponding Funniness and Rejection ratings within each joke category are only slightly negatively correlated or in some samples even uncorrelated; i.e. jokes are rejected (e.g. due to moral, ethical reasons, simplicity, complexity) relatively independent of their degree of funniness. Several reliability studies have been carried out and it could be shown that the Cronbach alphas (1951) are sufficiently high for each of the tests.

THE RELATIONSHIP OF SENSE OF HUMOUR TO CONSERVATISM AND TO INTOLERANCE OF AMBIGUITY

In several studies we tried to predict the personality of people who found the different types of humour funny and of those who rejected them (Hehl and Ruch, 1983, 1985; Ruch, 1981, 1984; Ruch and Hehl, 1983a, c, d, 1984). Our approach was twofold:

(1) We tried to locate our humour factors within comprehensive personality and attitude spaces.

(2) We tried to 'explain' the variance of the 'funniness/rejection' judgements using personality variables.

In our second approach the aim was to conduct the studies within the theoretical framework of the dimensions of humour. Taking into account the two different models of humour we formulated several hypotheses about links between humour and personality. Both

types of jokes contain incongruities that are unexpected and surprise the recipient. Suls states that

"... It is suggested that degree of incongruity is directly related to the amount of surprise experienced, and the amount of surprise that the punchline creates should produce a corresponding need to solve the problem, ... The prediction here is that the more surprising the punchline, the more one should want to overcome the surprise. When the problem is solved, the recipient should experience greater appreciation." (Suls, 1972, p. 91)

We have mentioned before that Suls' model fits our first factor well. Jokes of our second factor contain incongruities that cannot be resolved at all or cannot be completely resolved, or in which the resolution adds new incongruities (Rothbart and Pien, 1977). The need for resolution postulated by Suls will not be satisfied here completely. Our hypothesis was that there are individual differences in this need for resolution. Already in an everyday-life situation one can see that people differ with regard to their preference for structured, stable stimuli vs uncertain, unpredictable stimuli.

Our hypothesis was that these individual differences in the need for reducing uncertainty play a role in the appreciation of humour. Some people will prefer jokes with incongruities that can be resolved and reject jokes that remain incongruent. It was hypothesized that differences in humour emerge because some people like incongruities and other people like their resolution. We looked for personality variables that can predict these differences in appreciation of humour and we found two variables, intolerance of ambiguity and conservatism.

Intolerance of Ambiguity

Intolerance of ambiguity classifies people according to the intensity of their experience of ambiguous (i.e. new, unsolvable and complex) stimuli as a source of threat. Berlyne (1972) argues that the arousal decrease evoked by the resolution of incongruity is experienced as pleasant. We postulated that the reduction of ambiguity has higher values of reinforcement for the high ambiguity-intolerant people. Therefore they should rate the incongruity-resolution jokes funnier than the (ambiguity-) tolerant Ss. As nonsense jokes do not provide ambiguity reduction, they should be rejected more strongly by the group of intolerant persons.

We showed for a sample of 134 Ss, that 57 (of the 120 jokes used) correlated with the Intolerance of Ambiguity questionnaire (Brenkelmann and Brenkelmann, 1960b) at least at the 5 % level of significance (Ruch and Hehl, 1983a, c). Only one of the 57 jokes was of the nonsense type; the remaining 56 jokes came from the incongruity-resolution or the sex joke category. Altogether, the three joke types could account for 58 % of the reliable variance of the questionnaire. Comparison of extreme groups showed that intolerants preferred incongruity-resolution jokes and sex jokes and rejected nonsense jokes.

Conservatism

Conservatism was the other variable we tried to link with humour based on the incongruity-resolution structure. Why should conservatism predict an appreciation of incongruity-resolution jokes? Wilson's (1973a) dynamic theory of conservatism regards conservatism as generalized fear of uncertainty; the typical conservative person avoids stimuli which are uncertain in the sense of information theory (i.e. new, complex, incongruent, ambiguous).

Using this broad definition of conservatism, the characteristic 'intolerance of ambiguity' appears as a partial aspect of Wilson's theory.

It was hypothesized that conservatism is predictive for the Funniness rating of the incongruity-resolution factor and the Rejection rating of the nonsense jokes. The hypotheses were supported by two investigations.

The first, more explorative one, was carried out with a representative sample of 110 Austrians of both sexes, ranging in age from 18 to 60. In addition to age and sex, the sample was also balanced for types of profession and region. The second study, conducted to confirm the results of the first, used 134 male German students. Psychology students were not admitted. In addition to the different nationality, another conservatism questionnaire was used and the number of jokes was raised from 48 to 120.

In Study I the product-moment correlation between the factor scores of the incongruity-resolution jokes and an Austrian version of the Wilson and Patterson Conservatism Questionnaire (C-Scale, 1970) was quite high ($r = 0.48$, $d.f. = 108$, $P < 0.001$). There were no significant correlations with the nonsense ($r = -0.15$) and sex factors ($r = -0.12$). The multiple correlation between the Funniness ratings of the 48 jokes (which were the predictors) and the C-Scale (which was the criterion) was 0.79, indicating that 69 % of the reliable variance of the C-Scale could be explained by the jokes.

Each joke was correlated with the C-Scale separately. Twenty-one of the 48 correlations reached the 5 % level of significance. All of the jokes with positive significant correlations were from the incongruity-resolution category, indicating that conservatives prefer this type of humour. In addition an interesting higher order relationship was found; the loading of each joke in the first factor increases or decreases directly with the amount of overlap in variance between this joke and the C-Scale. In other words, the higher a joke is correlated with conservatism, the higher is its loading on the first factor. The more a joke is preferred by conservatives the more typical this joke becomes for that factor.

To demonstrate the strength of this relationship between the profile of the correlations and the factor loadings, Tucker's Phi was calculated and turned out to be very high (0.90). The corresponding values for loadings on the nonsense and sex joke factor were 0.10 and 0.24, indicating no relationship. We also demonstrated (Ruch and Hehl, 1983b), that the correlation between single conservatism items and funniness of the incongruity-resolution factor increased with their increasing (part-whole corrected) correlation with the C-Scale; i.e. the more typical an item was for conservatism the better it predicted funniness of incongruity-resolution jokes. The shapes of the two correlation profiles were very similar (Tucker's Phi was 0.94).

The hypotheses regarding rejection of jokes were also supported by our studies. The correlations of the factor scores with the nonsense factor, using the Rejection scale, was 0.33. Sex jokes correlated 0.35 and the incongruity-resolution factor correlated -0.09; i.e. conservatives rejected nonsense and sex jokes.

Study II should replicate the findings of Study I. The Funniness ratings of 74 of the 120 jokes correlated significantly with the German version (Schneider and Minkmar, 1972) of the C-Scale. Among these jokes there was no nonsense joke, and only those of the sex jokes with a double loading on the first factor correlated with the C-Scale. Again it was the incongruity-resolution type of humour that related to conservatism.

The product-moment correlation between the factor scores of the incongruity-resolution factor and the C-Scale was 0.46. The sex jokes correlated 0.28 and the nonsense jokes -0.27 with conservatism. The 'sum' of the three orthogonal varimax factors correlated 0.66 with the reliable variance of the criterion.

The loadings of the 120 jokes in the first factor and their single correlations to conservatism were again compared. Tucker's Phi was 0.91. Again, conservatives rejected nonsense jokes more strongly. The correlation with rejection of sex jokes was not significant.

It can be concluded from these two studies that conservatism can be seen as a variable that lies 'behind' the incongruity-resolution factor. The variance of the sample with regard to conservatism was responsible for the appearance of this factor. If we selected a sample of Ss equal in conservatism this factor would not appear. Conservatives are people who prefer solvable jokes while rejecting non-solvable ones. There are individual differences in the need for resolution of incongruities postulated by Suls and these individual differences can be predicted by conservatism.

SOME NEW QUESTIONS: A FURTHER STUDY

There are still some open questions. Although the conservatism questionnaires used in the two studies are somewhat different, both of them were derived from the original Wilson and Patterson scale. Whether other models of conservatism are equally predictive or not, needs to be investigated. We should also try to assess conservatism in different ways using non-reactive measures such as behaviour observations, preference for political parties, music or clothing. An experimental approach would be to manipulate situations to make people more conservative or less conservative and to determine whether or not there are systematical changes in their reactions to humour. Since there are life-span changes in conservatism, similar changes should be found in humour of the incongruity-resolution type. Indeed, parallel to conservatism, scores in funniness of incongruity-resolution jokes and rejection of nonsense jokes increase with increasing age (Ruch and Hehl, 1985b). Generally, all variables listed as antecedent factors (e.g. low intelligence, stimulus aversion, anxiety proneness) of the 'conservatism syndrome' (Wilson, 1973a) should be correlated with incongruity-resolution humour. The humour test should also be able to discriminate between groups which are known to be on the opposite poles of the liberal-conservative dimension.

One purpose of the following study is to investigate whether our results can be replicated using other conservatism questionnaires. Although certainly all definitions of conservatism will overlap theoretically and empirically to a great extent, they will also emphasize different components. This study should show whether or not incongruity-resolution humour is related to a factor common in all models of conservatism.

Related concepts

We also used other questionnaires measuring related dimensions. According to Eysenck (1975) there are three dimensions in the attitude space. Radicalism-Conservatism (R) is the most important one, nearly orthogonal to this dimension follow tough-tendermindedness (T) and capitalism-socialism (C). The question arises, whether humour is only related to R as the main axis in the attitude space or whether the other dimensions (T and C) also contribute to appreciation of humour. We therefore included these dimensions and another measure of toughness, machiavellianism (which is also orthogonal to conservatism) in our testing procedure. Intolerance of ambiguity and rigidity was assessed in order to replicate the previously found results (Ruch and Hehl, 1983c, 1985b). The former concept originated from research on the authoritarian personality (Adorno, Frenkel-Brunswik, Levinson and Sanford, 1950) and could be located in the toughminded-conservative quadrant. Thus, the second purpose of this study was to examine whether or not these concepts (in addition to

conservatism) improve the prediction of appreciation of humour. This can be seen as a first step in the location of sense of humour in the attitude space.

METHOD

Subjects and Material

Subjects were 61 male and 60 female students of the University of Düsseldorf. Psychology students were not admitted. Ss were recruited by means of pamphlets and were paid for their services. The range in age was 18 - 32 yr with a mean of 22.6 yr. The testing session lasted 4 hr including breaks. The questionnaires the Ss had to answer included four conservatism questionnaires and both forms (3WD-A and 3WD-B) of the humour test. The conservatism questionnaires used were those by Schneider and Minkmar (1972; German version of the Wilson and Patterson C-Scale, 1970), Eysenck (POI, Public Opinion Inventory; 1976), Cloetta (MK; 1983) and Schneewind, Schröder and Cattell (16PF-Q1; 1983). The questionnaire by Schneewind et al. is a subscale (Q1) of the German version of the 16PF. The scale is in fact a Radicalism scale with conservatives scoring low on it. Therefore we inverted the scores to get comparable results.

The MK questionnaire (Cloetta, 1983) also includes a score for machiavellianism and the POI (Eysenck, 1976) provides scores for toughmindedness and capitalism. Additionally, rigidity and intolerance of ambiguity (Brenkelmann and Brenkelmann, 1960a, b) were assessed.

Form A of the humour test was placed at the beginning of the test booklets. Form B was placed at the end in order to estimate short term reliability and to control testing effects. Between answering the two forms there were on the average 2 hr. Six Ss had incomplete sets of data leaving 115 Ss for the further analysis.

RESULTS

The first analysis was done to control for the reliability of the humour test. Cronbach's alphas (1951) were calculated for each scale of both forms separately. Then parallel test reliabilities (correlation between the corresponding subscales) were calculated (see Table 1).

insert table 1 about here

For inventories with only 10 items per scale the resulting coefficients were sufficiently high.

The product-moment correlations between the Conservatism scores and the 'Funniness'-ratings of the three joke types were calculated next. (Unless otherwise stated, two-tailed tests were applied.)

insert table 2 about here

It can be seen that all conservatism questionnaires correlated with funniness of incongruity-resolution jokes and sex jokes. Form B produced higher correlations but the relationship was also confirmed using Form A.

Differences were found in the predictability of the four scales. The Wilson et al. C-Scale was the best predictor of the incongruity-resolution jokes but had the lowest of all correlations with sex jokes. This category was best predicted by the Eysenck scale. This interactive effect showed that the differences in the predictability cannot be explained totally by different reliabilities of the four questionnaires. There were differences in the reliability estimations (Cronbach's alpha) of the four questionnaires (C-Scale, 0.84; POI, 0.84; MK, 0.65; 16PF-Q1, 0.60) which were partly due to differences in the number of items (C-Scale, 40; POI, 36; MK, 18; 16PF-Q1, 12). The differences in the ability to predict funniness of the first and the third factor resulted from other causes than differences in reliability.

All the correlations between conservatism and nonsense jokes had negative signs indicating a slight preference by liberals for nonsense jokes. The correlations using Form A were higher but, nevertheless, only two correlations reached the 5 % level of significance.

The correlations between the conservatism scales and the 'Rejection' scores were calculated next and are presented in Table 3.

insert table 3 about here

The results for the Rejection scale were not as consistent as those for the Funniness scale. Using the Cattell scale, the predicted rejection of nonsense by conservatives emerged. The Wilson et al. questionnaire was only predictive in Form A for rejection of nonsense.

Conservatism, as defined by the Eysenck and the Cloetta scales, was associated with low rejection of sex jokes and incongruity-resolution jokes. It is interesting to note that rejection of sex jokes was positively correlated with conservatism as defined by Cattell's scale. Here we have the puzzling result that conservatism is positively as well as negatively correlated with rejection of sex jokes. This might be due to different definitions of conservatism and will be analysed further. On the whole the correlations to the Rejection scales were not very high. These results will have to be replicated before reliable interpretations can be made.

Intercorrelation Among the Four Questionnaires

The question arose to what extent the different questionnaires measure the same concept. We have to analyse the intercorrelations between the four tests to determine whether or not the tests are comparable. The differences in their predictability might be due to the fact that their item contents only have small overlap. The intercorrelations among the four conservatism questionnaires are presented in Table 4.

insert table 4 about here

It can be seen that all the correlations were significant, high and in the expected direction. However, since the highest correlations were 0.53, there was a maximum overlap of only 28 % of the variance indicating that the questionnaires might stress different aspects.

The first hypothesis is substantiated; all four conservatism questionnaires correlated with each other and overlap in their prediction of appreciation of sense of humour. The next step was to investigate whether the other concepts are also predictive.

Correlation Between the Humour Tests and the Related Variables.

Both forms of the humour test were also correlated with the other variables assessed. Since we assumed humour to be related with the main dimension of the attitude space, conservatism, we expected no correlations with the orthogonal dimensions (toughmindedness, machiavellianism, capitalism) and lower correlations with those concepts (rigidity and intolerance of ambiguity), which are only partly related with conservatism. The results are presented in Tables 5 and 6.

insert table 5 about here

insert table 6 about here

Capitalism was associated with preference (high funniness; low rejection) of incongruity-resolution jokes and, to a greater extent, of sex jokes of both forms. Capitalistic attitudes facilitated appreciation of these types of jokes and (in Form A) lowered funniness of nonsense.

There was a small negative correlation between funniness of incongruity-resolution jokes and toughmindedness but it failed to reach significance in both forms. Machiavellianism showed no significant relationship to the humour scales at all.

Rigidity and intolerance of ambiguity were related to funniness of sex jokes and of incongruity-resolution jokes (one-tailed test). Intolerant Ss also rejected nonsense jokes (one-tailed test).

It can be concluded that only the third dimension in the attitude space, capitalism, contributes directly to appreciation of jokes. The Toughmindedness scale itself is not related to humour. The results found with the Intolerance of Ambiguity scale could be replicated here.

RELATIONSHIP TO RELATED VARIABLES

We expected to obtain information about the nature of the four conservatism scales by comparing differences in their correlations with the other variables assessed. We paid special attention to the relationship between the conservatism scales and the other dimensions in the attitude space, toughmindedness and capitalism. Therefore we correlated the four scales with the scores in toughmindedness, capitalism, rigidity, intolerance of ambiguity and machiavellianism. These intercorrelations and the intercorrelations between the predictors are presented in Table 7.

insert table 7 about here

We first considered the intercorrelations among the predictors. Capitalism was totally unrelated to the other variables. As expected, toughmindedness and machiavellianism were positively correlated. Machiavellianism was also correlated with rigidity and intolerance of ambiguity, which were themselves related.

Each of the four conservatism variables was correlated significantly with tendermindedness, capitalism, rigidity and intolerance of ambiguity but not with

machiavellianism. The Wilson et al. Total score was highly correlated with tendermindedness and, to a lesser extent, with capitalism. The Eysenck scale was highly related to intolerance of ambiguity and rigidity. This also agrees with the fact that intolerance of ambiguity (like the Eysenck scale) had a higher correlation with the sex jokes than with the incongruity-resolution jokes. The Cloetta scale was more correlated with tendermindedness and capitalism than with intolerance of ambiguity and rigidity. The Cattell scale was correlated with intolerance of ambiguity but generally revealed only low correlations, probably due to lower reliability. The location of different scales in Eysenck's three-dimensional system of attitudes, used as a frame of reference, was difficult due to its related axes. We can see that the Cloetta and the Cattell scales were mainly correlated with Eysenck's (R) factor. The Total score of the Wilson et al. scale, as a composite of several subscales, was located between Eysenck's R- and T- axes. Intolerance of ambiguity and rigidity were mainly correlated with conservatism, as defined by the Eysenck scale. Machiavellianism had only partial overlap with toughmindedness.

CANONICAL ANALYSIS

The problem with univariate analyses of the relationship between humour and conservatism is that they do not take into account the degree of relatedness among the predictors (the conservatism scales) and among the criteria (the humour scales). We do not know, whether the variance of the criterion that can be explained by conservatism scale A is the same that can be explained by scale B. If scale A and B predict totally different parts of the variance of the criterion, we can sum up their effects and obtain a higher proportion of explained variance. If they overlap in their prediction of the criterion, the combination of the predictors will bring only little increments in predictability of the criterion. To meet this problem, a canonical correlation analysis was carried out. This statistical method separates the relationships between two sets of variables into orthogonal axes and allows the number of statistically significant canonical factors to be determined. The first canonical correlation is calculated between the weighted sum of the variables of the predictor set (here four conservatism scales) and a weighted sum of the variables of the criterion set (here the 12 humour scores). The weights on both sides are chosen in order to maximize the correlation of the first set of the canonical axes. If the first canonical correlation is significant a second pair of canonical factors can be extracted from the residuum. Each subsequent pair is orthogonal to the previous axes and represents the maximum of the remaining relationships between the set of predictors and criteria.

Three eigenvalues and their respective canonical correlations turned out to be significant ($ev = 0.42$, $rc1 = 0.65$, $Chi-2 = 57.5$, $d.f. = 15$, $P < 0.001$; $ev = 0.26$, $rc2 = 0.51$, $Chi-2 = 32.0$, $d.f. = 13$, $P < 0.01$; $ev = 0.19$, $rc3 = 0.44$, $Chi-2 = 22.6$, $d.f. = 11$, $P < 0.05$). The first pair of canonical factors, connecting the humour test and the conservatism scales, shared 41.7 % of their variance. The second (orthogonal) pair shared 26.0 % and the third pair shared 19.1 % of the variance. Tables 8 and 9 present the correlations of the variables of both sets with their corresponding canonical axes (columns 1-3) and with the canonical factors of the opposite set (columns 4-6). The correlations with the factors of the own set can be interpreted as (canonical-) factor loadings. The correlations of variables with the canonical axes of the opposite set represented projections of single variables of one set into the space of the other set. In order to estimate the degree of relationship between each single variable of one set and the whole canonical space of the other set we added the squares of the cross-set correlations (columns 4-6). The resulting coefficient (h^2 , column 7) represented the communality, that is the proportion of variance the variable shares with the canonical factors of the opposite set.

In column 8 the square-root of the communality is presented which is analogous to a multiple correlation between the variable and the factors of the opposite set.

insert table 8 about here

insert table 9 about here

Within-set Correlations

It can be seen (Table 8, column 1), that the first canonical factor (A1) of the predictor set was highly loaded by all conservatism scales. Factor 1 of the criterion (B1) set was positively loaded by funniness of incongruity-resolution jokes, funniness of sex jokes and by rejection of nonsense jokes (Table 9, column 1). Funniness of nonsense jokes and rejection of incongruity-resolution jokes (Form B) and sex jokes (Form A) have negative loadings. This highest canonical correlation showed that conservatives appreciate (high funniness; low rejection) incongruity-resolution jokes and sex jokes and dislike (low funniness; high rejection) nonsense jokes.

Factor 2 (A2) was mainly loaded by the Wilson and Patterson scale. There was another positive loading by the Cattell scale while the Cloetta and Eysenck scales loaded negatively. On the criterion side this axis (B2) was mainly characterized by the rejection of sex jokes; the other rejection scales had smaller but still positive loadings. B2 was loaded positively by funniness of incongruity-resolution jokes and negatively by funniness of sex jokes. Considering the fact that these two types of jokes are intercorrelated positively their opposite position on this axis is remarkable. This represents the result also found in the correlation matrix (Table 2): the Wilson scale was associated more with incongruity-resolution jokes than with sex jokes. The Wilson and Cloetta scales were also the only scales positively correlated with rejection of nonsense jokes and of sex jokes.

The scales by Cattell and Cloetta loaded the third canonical factor (A3) positively and negatively, respectively. In the criterion set this factor (B3) was mainly composed of Rejection scores. This factor summarized one result of Table 3: conservatives, as defined by the Cattell et al. scale (relative to conservatives as defined by the other scales), generally tended to have higher Rejection scores.

Cross-set Correlations

The correlations across the variable sets revealed high correlations of each of the conservatism questionnaires with the first axis (B1) of the criterion set (Table 8, column 4). Specific parts of the variance of the Wilson and Cattell scales were also related with the second (B2) and third (B3) canonical dimensions of the predictor set, respectively. Between 30 and 33 % of the variance (Table 8, column 7) of the single conservatism scales could be projected into the 'humour space'; i.e. nearly one third of the variance of conservatism could be predicted by the canonical axes of the humour variables set. The corresponding correlations (column 8) were between 0.55 and 0.58.

Projections of the humour scales into the conservatism space revealed generally lower rates (between 0.02 and 0.22) of explained variance (Table 9, column 7); i.e. the corresponding correlations were between 0.15 and 0.47 (column 8). Only the main axis (A1)

was correlated with the Funniness scores; funniness of incongruity-resolution jokes and of sex jokes of both forms were significantly related with A1. This axis was also related negatively to appreciation of nonsense, but the corresponding correlations were only significant in one form each. The Rejection scores correlated mainly with axes A2 and A3.

Furthermore, we calculated correlations between the canonical factor scores and the related variables. The results showed that A1 was highly correlated with capitalism ($r = 0.45$), rigidity ($r = 0.39$) and intolerance of ambiguity ($r = 0.50$, all $d.f. = 113$, $P < 0.001$). Surprisingly, toughmindedness was negatively related ($r = -0.41$, $P < 0.001$) while machiavellianism correlated positively ($r = 0.17$, NS). It turned out that A2 could be interpreted as a factor of tendermindedness, since there were negative correlations with machiavellianism ($r = -0.25$, $P < 0.01$) and toughmindedness ($r = -0.33$, $P < 0.001$). Those parts of the variance of the C-Scale, which were independent of the general conservatism factor A1, also contributed to this factor. A3 was correlated only with toughmindedness ($r = 0.24$, $P < 0.01$).

Generally speaking, canonical axis 1 (which explains 41.7 % of the variance) represents the general effects of conservatism, Factors 2 (26.0 %) and 3 (19.1 %) were specific effects due to the differences in the conservatism scales. In order to investigate these differences we will have to examine the item contents and the subfactor compositions of the four scales. But we can summarize that these differences can be 'detected' by the humour scales; i.e. these differences result in different correlation patterns with the humour scores.

DISCUSSION

This study tried to replicate the findings of Ruch (1981, 1984) and Ruch and Hehl (1983c) using four different methods to assess conservatism. It was predicted that conservatives would prefer solvable jokes and reject unsolvable jokes. Funniness of incongruity-resolution jokes and, to a lesser extent, of sex jokes, should be correlated with the four conservatism questionnaires. Rejection of nonsense should correlate negatively with the four questionnaires. Furthermore, it was investigated whether or not increments in prediction of humour can be obtained by including variables of different locations in the attitude space. Also, the previously found effects (Ruch and Hehl, 1983c) of intolerance of ambiguity and rigidity should be replicated.

The first hypothesis was confirmed by this study. Each of the correlations between the conservatism scales and funniness of the first and third humour factor of both forms was significant and in the expected direction. This result also appeared as a general effect (explaining 42 % of variance) in a canonical regression analysis. People who generally avoid ambiguous uncertain stimuli prefer humour which allows them to make sense of puzzling surprising information. They have a stronger need to overcome the surprise induced by the punchline, which, according to Suls, is positively related to appreciation of humour.

In order to understand some punchlines it is necessary to have certain attitudes and values. These attitudes and values might be helpful in developing a cognitive rule (Suls, 1972) which renders incongruity meaningful faster. Conservatives may also find their attitudes more often reflected in jokes of Factor 1 and 3 than liberals. Another possible interpretation would be that the same punchlines might be experienced to a different extent as incongruent and surprising by conservatives and liberals.

But there were also differences in the prediction of incongruity-resolution based jokes. Wilson's C-Scale was more predictive of funniness of Factor 1 and Eysenck's R-scale was more predictive of funniness of Factor 3. There was some evidence that this might be due to differences in toughmindedness. The C-Scale, as a composite score, could be located in the tenderminded, conservative (and capitalistic) octant where also other predictors of funniness

of incongruity-resolution jokes could be found. We showed (Ruch and Hehl, 1985b) that funniness of this joke type increases with age, aggression inhibition and (although not always significant) 'faking' scores. These three variables correlated positively with conservatism and negatively with toughmindedness; i.e. they are located in the tenderminded, conservative octant. There was also a (small but consistent) negative correlation between the P (psychoticism) scale of the EPQ and funniness of incongruity-resolution jokes (Hehl and Ruch, 1985; Ruch and Hehl, 1985b) confirming the importance of tendermindedness. We therefore assume that the first humour factor is preferred by tenderminded conservatives (albeit the first factor is more closely associated with the conservatism axis).

On the other hand, there is some evidence for funniness of sex jokes being preferred by toughminded, capitalistic conservatives. Although the Eysenck scale itself is a potent predictor, increments in predictability can probably be obtained by including various measures of 'toughness'. There are some variables which predict funniness of sex jokes but not (or to a lesser extent) funniness of the first factor. These variables include, for example, dominance, masculinity, low Premia (the 16PF-I scale for tendermindedness) and extraversion (Hehl and Ruch, 1985). Each of the variables is associated with 'toughness'. Males give consistently higher funniness ratings to sex jokes than females (Ruch and Hehl, 1985b). In the present and also in other samples (Ruch and Hehl, 1983c, 1985b) intolerance of ambiguity and rigidity correlated higher with sex jokes than with the first factor. Both concepts usually correlated with toughmindedness (Eysenck, 1954). Furthermore, funniness of sex jokes was correlated with scales of the Allport-Vernon-Lindzey 'Study of Values' (1960), namely positive with 'Economic' and 'Political' values and negative with 'Social' and 'Aesthetic' values (Ruch and Hehl, 1985c). These values can also be located in the attitude space; the former two in the toughminded-conservative and the latter two in the tenderminded-liberal quadrant (Eysenck, 1954). Thus, their position also support the hypothesis. The other two value scales, 'Theoretical' (located in the toughminded-radical quadrant) and 'Religious' (located in the tenderminded-conservative quadrant), were not related with funniness of sex jokes. Adelson (1947) found that male students with high Ethnocentrism scores rated sex jokes as more funny than students with low Ethnocentrism scores. His result also supports our toughminded conservative hypothesis since ethnocentrism can be found in the toughminded-conservative quadrant.

In summary, it appears that conservatism predicts liking of jokes based on the incongruity-resolution structure (i.e. the first factor and incongruity-resolution sex jokes). But among conservatives, toughminded (or in Wilson's model: 'realistic') Ss prefer sex jokes and tenderminded ('idealistic') Ss (slightly) prefer the jokes contents of the first factor. This view is supported by the fact that the second canonical factor ('tendermindedness') was positively loaded by Factor 1 and negatively by Factor 3. This model also partly solves the contradiction between Wilson's results and ours. His 'hedonistic' Ss preferred sex jokes. But the Hedonism subscale (hedonistic; liberal with regard to sex) also loads on the realism (toughmindedness) factor. Indeed, also in our samples the Anti-hedonism subscale correlated with low funniness and high rejection of sex jokes (Ruch 1984; Ruch and Hehl, 1985b) but there was always a higher correlation with the conservatism Total score. Of course, the differences in our results might also be due to general changes in the last decade or due to the different nationality. But there is some evidence for a cross cultural stability of a positive correlation between conservatism and our first humour factor. Wilson (1973b, p. 179) reported that

"... the preferences of conservatives include 'lavatorial' jokes and oblique references to 'the privates'."

Those jokes can be found in our first factor. Also the 'control' jokes used in Chapman and Gadfield's (1976) study, correlating positively with conservatism, had the typical incongruity-resolution structure.

There are two problems with this tentative location of the humour scales in the attitude space. First, the Toughmindedness scale itself was not related with funniness of the joke types. But since the R, T and C scales were intercorrelated they were not a good frame of reference. Correlations with external variables can be rotated away by slight changes in the location of the axes. We will conduct a factor analysis of all items of the conservatism questionnaires. Then we will try to locate the humour scales in this comprehensive attitude space more exactly (Ruch and Hehl, 1985a). The second problem concerns the differences between the two subclusters of sex jokes, incongruity-resolution sex jokes and nonsense sex jokes. The tentative location of sex jokes is probably only valid for incongruity-resolution sex jokes but not for nonsense sex jokes. In subsequent analyses it will be necessary to separate them.

With regard to rejection of humour, the correlation patterns were not very systematic. Only rejection of nonsense loaded on the first canonical axes. The Rejection scores were loaded by (canonical) Factors 2 and 3 which were specific effects of single conservatism scales. Therefore it will be necessary to analyze the subscale composition of the different questionnaires and to investigate which subscales are correlated with the Rejection scores and which are not.

Conservatives, as well as ambiguity-intolerant Ss rejected nonsense humour. Nonsense humour obviously frustrated their need to resolve incongruities by remaining unsolvable and left them in a state of puzzlement. The Cattell scale has also been predictive for rejection of nonsense in another sample (Hehl and Ruch, 1985). Socialists and radicals (as defined by Eysenck and Cloetta) give high Rejection scores to incongruity-resolution jokes and to sex jokes. But the correlations should be replicated before a detailed interpretation is done. However, we can see that Funniness and Rejection are quite different. In most of our studies, these scales are uncorrelated and the same predictors are seldom associated with both aspects in a given humour factor.

On the whole it can be seen that inclusion of individual difference variables seems to be a fruitful approach to humour research. The individual difference paradigm will continue to contribute to our understanding of the phenomenon of humour.

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Table 1. Reliabilities (Cronbach's alpha) of the humour scales and the intercorrelations between the two forms

Reliability	F U N N I N E S S			R E J E C T I O N		
	Incongruity resolution	Nonsense	Sex jokes	Incongruity resolution	Nonsense	Sex jokes
3WD-A	0.83	0.77	0.84	0.76	0.76	0.91
3WD-B	0.85	0.79	0.85	0.82	0.74	0.90
3WD-A/3WD-B	0.80	0.75	0.79	0.78	0.67	0.88

Table 2. Correlations between the 'Funniness' scores and the four conservatism questionnaires

Conservatism scales	I n c o n g r u i t y r e s o l u t i o n		N o n s e n s e		S e x j o k e s	
	FORM A	FORM B	FORM A	FORM B	FORM A	FORM B
Wilson's C-scale	.32***	.40***	-.21*	-.12	.19*	.25**
Eysenck's POI	.28**	.33***	-.17	-.07	.44***	.47***
Cloetta's MK	.24**	.31**	-.24*	-.13	.28**	.29**
Cattell's 16PF-Q1	.19*	.24*	-.16	-.13	.18*	.27**

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Table 3. Correlations between the 'Rejection' scores and the four conservatism questionnaires

Conservatism scales	I n c o n g r u i t y r e s o l u t i o n		N o n s e n s e		S e x j o k e s	
	FORM A	FORM B	FORM A	FORM B	FORM A	FORM B
Wilson's C-Scale	-.06	-.17	.22*	.10	.02	.09
Eysenck's POI	-.10	-.23*	.10	.13	-.20*	-.18*
Cloetta's MK	-.13	-.28**	.02	.15	-.21*	-.15
Cattell's 16PF-Q1	.06	.04	.33***	.34***	.13	.19*

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Table 4. Intercorrelations among the four conservatism scales

Conservatism scales	Wilson	Eysenck	Cloetta
Eysenck's POI	0.53***		
Cloetta's MK	0.50***	0.53***	
Cattell's 16PF-Q1	0.50***	0.50***	0.37***

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Table 5. Correlations between the 'Funniness' scores of both forms of the humourtest and toughmindedness, capitalism, intolerance of ambiguity, rigidity and machiavellianism

	Incongruity resolution		Nonsense		Sex jokes		FORM A	FORM B
	FORM A	FORM B	FORM A	FORM B	FORM A	FORM B		
	Toughmindedness	-.14	-.16	.15	.09	.04		
Capitalism	.22*	.21*	-.22*	-.09	.32***	.28**		
Rigidity	.16*	.28***	-.08	-.01	.20*	.24**		
Intolerance of ambiguity	.17*	.26**	-.06	.02	.37***	.40***		
Machiavellianism	.04	.02	.09	.14	.07	.13		

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Table 6. Correlation between the 'Rejection' scores of both forms of the humourtest and toughmindedness, capitalism, intolerance of ambiguity, rigidity and machiavellianism

	Incongruity resolution		Nonsense		Sex jokes		FORM A	FORM B
	FORM A	FORM B	FORM A	FORM B	FORM A	FORM B		
	Toughmindedness	.00	.08	-.14	-.04	-.10		
Capitalism	-.21*	-.31**	.03	-.09	-.36***	-.35***		
Rigidity	-.07	-.08	.10	.08	.02	.05		
Intolerance of ambiguity	.07	-.03	.15*	.17*	-.03	-.04		
Machiavellianism	-.04	.07	-.06	.02	.09	.06		

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Table 7. Intercorrelations between the four conservatism scales and toughmindedness, capitalism, intolerance of ambiguity, rigidity and machiavellianism

	Wilson	Eysenck	Cloetta	Cattell	Tough mindedness	Capitalism	Rigidity	Intolerance of ambiguity
Toughmindedness								
Capitalism	.33***	.42***	.37***	.21*	-.14			
Rigidity	.37***	.40***	.24**	.24**	-.06	.08		
Intolerance of ambiguity	.34***	.55***	.30**	.32***	-.02	.01	.47***	
Machiavellianism	-.09	.17	.16	.15	.26**	-.03	.21*	.30**

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Table 8. Loadings of the four conservatism scales on the three significant canonical factors of the predictor set (A1-A3) and their correlation with the canonical factors of the criterion set (B1-B3)

Conservatism scales	CANONICAL FACTORS OF Predictor set			CANONICAL FACTORS OF Criterion set			h2	r
	A1	A2	A3	B1	B2	B3		
Wilson's C-Scale	.71	.65	-.26	.46***	.33***	-.12	.33	.58
Eysenck's POI	.88	-.19	.05	.57***	-.10	.02	.33	.58
Cloetta's MK	.80	-.17	-.35	.52***	-.09	-.15	.30	.55
Cattell's 16PF-Q1	.69	.31	.63	.45***	.16	.27**	.30	.55

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Table 9. Loadings of the scales of the humour test on the three significant canonical factors of the criterion set (B1-B3) and their correlation with the canonical factors of the predictor set (A1-A3)

	CANONICAL FACTORS OF			CANONICAL FACTORS OF			h ²	r		
	Criterion Set			Predictor Set						
	Form	B1	B2	B3	A1	A2	A3			
'Funniness'										
Incongruity	A	.50	.21	-.18	.32***	.11	-.08	.12	.35	
resolution jokes	B		.61	.27	-.25	.39***	.14	-.11	.19	.43
Nonsense jokes	A		-.37	-.10	.14	-.24*	-.05	.06	.06	.25
	B	-.20	-.12	-.02	-.13	-.06	-.01	.02	.15	
Sex jokes	A	.61	-.33	-.03	.39***	-.17	-.01	.18	.43	
	B	.68	-.21	.11	.44***	-.10	.05	.22	.47	
'Rejection'										
Incongruity	A	-.15	.16	.34	-.09	.08	.15	.04	.20	
resoluton jokes	B		-.37	.21	.60	-.24*	.11	.26**	.14	.37
Nonsense	A	.26	.49	.50	.17	.25**	.22*	.14	.37	
jokes	B	.33	.10	.54	.21*	.05	.24*	.10	.32	
Sex jokes	A	-.23	.58	.47	-.15	.30**	.20*	.15	.39	
	B	-.14	.67	.48	-.09	.34***	.21*	.17	.41	

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.