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# AGE DIFFERENCES IN THE ENJOYMENT OF INCONGRUITY-RESOLUTION AND NONSENSE HUMOR DURING ADULTHOOD

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This study tested a model of the development of incongruity-resolution. and nonsense humor during adulthood . Subjects were 4.292_14- to 66-year-old Germans. Twenty jokes and cartoons representing structure-based humor categories of incongruity resolution and nonsense were rated for funniness and aversiveness. Humor structure preferences were also assessed with a direct comparison task. The results generally confirmed the hypotheses. Incongruity-resolution humor in-creased in funniness and nonsense humor decreased in. funniness among progressively older subjects after the late teens. Aversiveness of both forms of humor generally decreased over the ages sampled. Age differences in humor appreciation were strongly correlated with age differences in conservatism. An especially strong parallel was found between age differences in appreciation of incongruity -resolution humor and age differences in conservatism.

## AGE DIFFERENCES IN THE ENJOYMENT OF INCONGRUITY-RESOLUTION AND NONSENSE HUMOR DURING ADULTHOOD

Little attention has been given to the development of humor after adolescence. McGhee, Ruch, and Hehl (1990), however, recently advanced a model of humor development in. adulthood. The model is based on data demonstrating age differences in certain personality variables (discussed later), along with findings showing a strong link between these variables and appreciation of certain forms of humor. Because these personality variables are presumed to mediate preferences for the kinds of humor explained by the model, any developmental changes in these variables during the adult years should lead to parallel changes in the kinds of humor appreciated. This study constitutes a first test of this model. using a large cross-sectional sample.

Ruch (1981, 1984; Ruch & Hehl 1986a) has completed several factor analytic studies that consistently point to the importance of two principal humor-appreciation factors: (a) incongruity plus resolution (i.e., incongruities containing the information--explicitly presented or implicitly understood--required for full resolution) and (b) nonsense (i.e. incongruities that are only partly resolvable, not resolvable, or in which the apparent resolution adds yet another incongruity). Interestingly; these factors were based on the structure of cartoons and jokes, not on their content. Thus, an incongruity-resolution structure or a nonsense structure consistently emerges as the key determinant of appreciation across a wide range of specific content. Ruch (1981, 1984: Ruch & Hehl, 1987) has also demonstrated the importance of distinguishing between positive and negative reactions to humor and that appreciation should be viewed as the net effect of both funniness and aversiveness. To this point, humor researchers have neglected to simultaneously examine these two components of humor appreciation.

The model of humor development advanced by McGhee et al. (1990) is based on personality dimensions that (a) are strongly correlated with appreciation of incongruity-

resolution and nonsense humor and (b) show age-related changes between adolescence and the onset of the retirement years. They noted that the inconsistent findings relating personality variables to humor appreciation probably reflect the fact that the studies focused on the content rather than on the structure of the humor stimuli used. Their model is based on findings relating humor to conservatism intolerance of ambiguity; and sensation seeking. Numerous studies have shown that more conservative individuals find incongruity-resolution humor funnier and less aversive than do more liberal individuals, whereas the reverse pattern occurs for nonsense humor (Hehl & Ruch, 1985,1990; Joachim, 1986; Rath, 1983; Ruch, 1981.1984; Ruch & Hehl, 1985, 1986b). Similarly; increased funniness of incongruity-resolution humor and aversiveness of nonsense humor have been found to be associated with increased intolerance of ambiguity (Ruch & Hehl 1983b, 1985, 1986a) and decreased sensation seeking (Hehl & Ruch, 1985; Ruch 1988). The findings are all consistent with theoretical view's that these personality dimensions should he associated (positively for conservatism and intolerance of ambiguity and negatively for sensation seeking) with dislike or avoidance of novel, complex, incongruous. or ambiguous events that leave one in a state of high subjective uncertainty (Kish, 1973; Wilson, 1973; Zuckerman, 1979). Comparable empirical support for these theoretical views has been obtained in the areas of art (Furnham & Bunyan, 1988; Wilson. 1973: Zuckerman, 1979), music (Glasgow, Cartier, & Wilson, 1985; Litle & Zuckerman, 1986), and poetry (Gillies & Campbell, 1985).

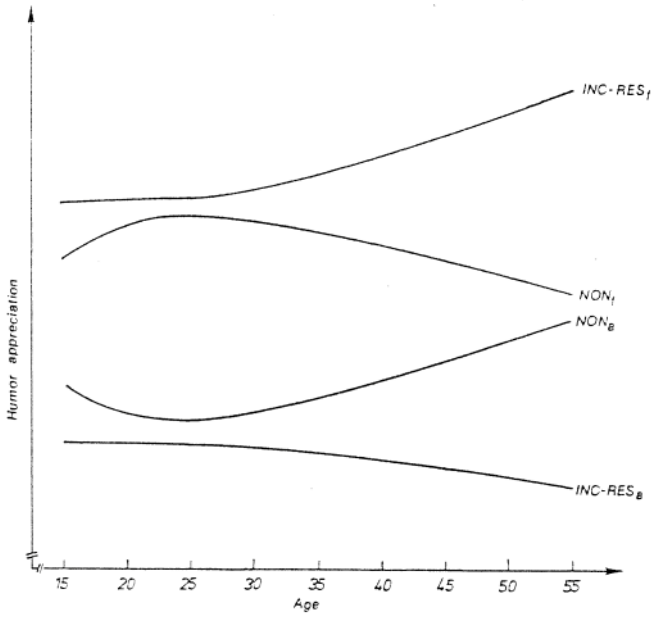


Figure 1. Adult life span changes in. funniness and aversiveness of both incongruity -resolution and nonsense humor. as predicted by the model of humor development proposed. (INC-RES*= funniness of incongruity-resolution humor; NON = funniness of nonsense humor; NON* = aversiveness of nonsense humor; INC-RES* = aversiveness of incongruity-resolution humor. )

Finally, Ruch (1986) directly examined the link between humor appreciation and the enjoyment or dislike of various forms of complexity. novelty, and asymmetry. He found that subjects who showed greater appreciation of incongruity-resolution humor also preferred simpler patterns of dots on a card and simpler art forms. Subjects who showed greater appreciation of nonsense humor preferred more complex patterns of dots, asymmetrical (as opposed to symmetrical) polygon forms, and more complex and fantastic art forms, and they chose to spend a greater amount of time wearing prism glasses that distort the visual field.

In short, conservatism, sensation seeking, and intolerance of ambiguity have been strongly linked with enjoyment of or interest in a broad range of events (including humor) that increase subjective uncertainty.

Numerous cross-sectional studies have demonstrated age differences in these personality dimensions during adulthood (see McGhee et al., 1990, for a review). For example, most data suggest that age differences in conservatism do not occur until the late 20s, when they increase until past age 60. Sensation seeking, on the other hand, when studied cross-sectionally, peaks in the late teens or early 20s and decreases during the adult years. These and other data led McGhee et al. (1990) to propose the model of humor development shown in Figure 1.

In this study, we used a cross-sectional sample to test this model. Obtaining supporting data by such an approach leaves open, of course, the possibility that mere cohort differences account for the age differences observed. Thus, older cohorts may always have been more conservative and less sensation seeking than younger ones throughout their development. The demonstration of predicted age differences, however, is an essential preliminary step to undertaking a longitudinal study aimed at determining whether any age differences found also represent genuine developmental changes.

The following specific hypotheses were tested, based on the model shown in. Figure 1 (see McGhee et al., 1990, for a more detailed rationale for these hypotheses); (a) Funniness of incongruity-resolution humor (INC-RESf) should slowly increase with age, beginning in the late 20s or early 30s (i.e., it should develop parallel to conservatism, the most potent predictor of INC-RESf). (b) Funniness of nonsense humor (NONf) should change in the form of a mild inverted U-curve, with a progressive drop after age 30 (i.e., it should develop parallel to changes in the most potent predictors of NONf: general sensation seeking, experience seeking, and venturesomeness). (c) Aversiveness of incongruity-resolution humor (INC-RESa) should decrease with increasing age, especially after age 30. This prediction is based on findings showing INC-RESa to be correlated with predictors of general aversiveness of humor (emotional lability or neuroticism, anxiety, and depressivity) and with the predictors of appreciation of the incongruity-resolution structure of humor (conservatism). (d) Aversiveness of nonsense humor (NONa) should be related to age in a U-shaped manner, with the lowest point of aversiveness Occurring at approximately age 30. This prediction reflects the anticipated combined influence of age differences in two separate groups of predictors of NONa, namely the specific predictors of NONa (low sensation seeking and high conservatism) and the general predictors of aversiveness of humor.

## METHOD

### General Background

Subjects were participants in a vocational guidance project offered by a well-known German consumer magazine. One part of this project consisted of a psychological test battery that consumers could answer at home, providing information. regarding their personality and aptitudes. The tests were administered in five parts every month over a 5-month period. Reprints of the tests were also included in certain newspapers and in all branches of a particular bank.

### Subjects

Among those returning forms, only the 4,292 subjects who participated in all five tests and whose percentage of missing data did not exceed a certain limit were included in our sample. There were 3.057 male subjects between 14 and 66 years of age and 1,235. female subjects between 14 and 54 years. The breakdown by sex in the different age groups is shown in Table 1. The age-group intervals used were a compromise between the desire to have enough intervals to represent meaningful age differences and to have a reasonable number of subjects in each group.

The sample was far from representative. Same groups were undoubtedly overrepresented (e.g., those interested in changing their professions, the unemployed, young people just starting a career, students, and those interested in psychological testy). There was probably no age group that constituted a random sample, but we had no reason to believe that this lack of representativeness would result in a heavy biasing of scores. In any case, because we expected different patterns of age differences for different humor measures, a possible bias can be estimated.

Table 1. Distribution by Sex and Age Group

| Age (years) | Male | Female | Total |
|---|---|---|---|
| 14-16 | 393 | 298 | 691 |
| 17-19 | 762 | 477 | 1239 |
| 20-22 | 400 | l05 | 505 |
| 23-25 | 377 | 103 | 480 |
| 26-28 | 351 | 69 | 420 |
| 29-31 | 266 | 52 | 318 |
| 32-35 | 217 | 51 | 268 |
| 36-40 | 128 | 40 | 168 |
| 41-45 | 88 | 21 | 109 |
| 46-50 | 43 | 14 | 57 |
| 50+ | 32 | 5 | 37 |
| Total | 3,057 | 1,235 | 4,292 |

## Materials and Procedure

The tests were presented on four pages in the middle of each magazine. Instructions at the beginning of each test indicated how to answer, materials that could be used, and conditions to choose when. answering (during the day, when alert, in a quiet room without consulting others, and with no alcohol intake).

Two sense-of-humor tests were included among a series of questionnaires (measures of personality, intelligence, psychosomatic disorders, attitudes, and vocational interests). Several sociodemographic questions were also asked.

Humor tests. The humor tests were included in the fourth and fifth questionnaires. A total of 20 jokes and cartoons were used (10 in each test) including 10 incongruity-resolution jokes or cartoons and 10 nonsense cartoons. Jokes and cartoons were rated for funniness and aversiveness on unipolar S-point scales (1 = not funny at all, 5 = extremely funny: 1 = not aversive at all, 5 = extremely aversive). Some were borrowed from our standard tests. and others had never been used.

Relative funniness of the two types of humor was assessed in a direct fashion by presenting four pairs of jokes or cartoons at the end of the third questionnaire. One of each pair was representative of the nonsense category and the other representative of the incongruity-resolution category (these jokes and cartoons were different from the 20 mentioned earlier). Subjects were asked to indicate on a 5-point scale whether they

considered A much funnier, A slightly funnier, A and B equally funny, B slightly funnier, or B much funnier. A structure-preference (SP) score was derived by adding the four judgments. High scores indicated greater preference for incongruity-resolution humor, and low scores indicated the same for nonsense humor. A score of l2 indicated an overall lack of preference.

Because prior research pointed to a general preference for incongruity-resolution humor over nonsense humor, preference for one structure over the other was also indirectly assessed by computing a separate structure-preference index (SPI) for each subject for both funniness (SPIf= total INC-RESf - total NONf) and aversiveness (SPIa = total NONa - total INC-RESa) for the set of 20 cartoons and jokes. Thus, higher positive scores always indicate greater appreciation (greater funniness and reduced aversiveness, respectively) of incongruity-resolution humor, whereas higher negative scores indicate greater appreciation of nonsense humor.

Index of conservatism. A measure of conservatism was necessary to test the view that age differences in humor appreciation occur parallel to age differences in conservatism. A valid conservatism index was constructed by using four subscales from one of the attitude scales administered (Hehl & Wirsching, 1983) that correlated highly with the Wilson and Patterson Conservatism Scale (Wilson, 1973) in two prior studies (Hehl & Ruch, 1990). These four scales were the Traditional Family Ideology, Liberal Upbringing of Children, Orientation Toward Work and Achievement, and Orientation Toward Property and Saving Money scales, In combination, these scales provided a good index of subjects' level of conservatism.

Because the correlations between conservatism and these scales vary in strength, and the data from prior studies did not include subjects overage 30, the scores were factor analyzed to empirically establish a conservatism factor. Thus, the scales were intercorrelated, and the factor scores for the first principal component were computed. The loadings of the four scales were .55, -.63, .59, and .70, respectively. The order of the size of the loadings is comparable with the order of the correlations of the scales with the conservatism scale.

## RESULTS

Given the large number of subjects used in this study only effects significant at the .01 level are discussed.

### Preliminary Analyses

Two principal-components factor analyses computed on funniness and aversiveness ratings confirmed the factor Structure obtained in. previous studies. In both cases, the first two factors were clearly identified as incongruity-resolution humor and nonsense humor. The same factor Structure was obtained for both sexes.

Additional analyses (Cronbach's alpha) revealed no age trends in the reliability (internal consistency) of the four humor scales. In 37 of 44 cases, these reliabilities were in the .70s or .80s; none fell below .64. Thus, the four humor scales assessed appreciation with comparable quality at all age levels. Similarly, Spearman-Brown split-half reliabilities (prophecy formula) computed on the two humor tests (administered 1 month apart) revealed reliabilities ranging from .64 to .77.

### Age Differences

Separate 2 x 2 x 11 (Sex x Type of Humor x Age Level) repeated measures analyses of variance (ANOVAS) were computed on funniness and aversiveness ratings. Prior studies have generally shown no sex differences in appreciation of incongruity-resolution and nonsense humor, and our results confirmed this finding for both funniness Scores, F(1 , 4270) = 0.95, ns, and aversiveness scores. F(1, 4270) = 2.31, ns. Accordingly these results are not discussed here. A type-of-humor main effect was obtained in each case, indicating that incongruity-resolution humor was generally seen as funnier than nonsense humor. F(l, 4270) = 104.14, p <.001, whereas nonsense humor was judged more aversive than incongruity-resolution humor, F(l, 4270) = 272.53, p <.001.

Table 2. Funniness and Aversiveness of Incongruity-Resolution Humor and Nonsense Humor

| | | M | | | | SD | | | |
|---|---|---|---|---|---|---|---|---|---|
| Measure | n | INC-RESf | NONf | INC-RESa | NONa | INC-RESf | NONf | INC-RESa | NONa |
| Age (years) | | | | | | | | | |
| 14-16 | 691 | 26.71 | 25.38 | 18.52 | 21.13 | 5.93 | 5.53 | 6.79 | 6.70 |
| 17-19 | 1.239 | 25.56 | 25.63 | 18.00 | 19.82 | 5.90 | 5.69 | 6.70 | 6.37 |
| 20-22 | 505 | 25.56 | 25.41 | 17.40 | 19.53 | 5.68 | 5.92 | 6.58 | 6.42 |
| 23-25 | 480 | 26.04 | 25.26 | 16.55 | 18.77 | 5.58 | 6.04 | 6.24 | 6.34 |
| 26-28 | 420 | 25.64 | 24.97 | 16.00 | 18.56 | 5.70 | 5.75 | 6.26 | 6.21 |
| 29-31 | 318 | 26.33 | 24.36 | 15.41 | 18.02 | 5.40 | 5.67 | 5.28 | 6.07 |
| 32-35 | 268 | 26.26 | 24.34 | 16.02 | 18.46 | 6.04 | 5.81 | 5.46 | 6.19 |
| 36-40 | 168 | 26.27 | 24.18 | 15.40 | 18.32 | 5.37 | 5.72 | 5.17 | 5.35 |
| 41-45 | 109 | 27.59 | 24.64 | 15.34 | 18.34 | 5.30 | 5.30 | 5.65 | 6.17 |
| 46-50 | 57 | 27.70 | 22.74 | 15.54 | 19.30 | 6.90 | 6.45 | 6.46 | 7.56 |
| 50+ | 37 | 28.81 | 23.54 | 14.49 | 17.73 | 5.71 | 5.36 | 5.40 | 6.72 |
| Sex | | | | | | | | | |
| Male | 3.057 | 26.07 | 25.30 | 16.94 | 19.08 | 5.80 | 5.75 | 6.59 | 6.48 |
| Female | 1.235 | 25.96 | 24.76 | 17.53 | 20.23 | 5.81 | 5.80 | 6.06 | 6.23 |
| Total | 4.292 | 26.04 | 25.15 | 17.11 | (9.41 | 5.81 | 5.77 | 6.45 | 6.43 |

Note. INC-RESf= funniness of incongruity-resolution humor; NONf funniness of nonsense humor: INC-RESa = aversiveness of incongruity-resolution humor; NONa = aversiveness of nonsense humor.

Significant age-level main effects were obtained for both funniness. F(10, 4270) = 2.31, p < .01, and aversiveness, F(10, 4270) = 8.50, p <.001. However, the Age Level x Humor Type interaction effects provided the key tests of the prediction that appreciation of incongruity-resolution and nonsense humor show different patterns of age differences across the adult years. The interaction effects were significant for both funniness, F(10, 4270) = 7.97, p < .001, and aversiveness, F(10, 4270) = 8.50, p <.001. The mean scores associated with these effects are shown in Table 2 and Figure 2.

All four hypotheses were tested by deriving polynomials from the pertinent curve in our developmental model shown in Figure 1. Thus, Hypothesis a was tested with polynomials derived from the INC-RESf curve, Hypothesis b with polynomials derived from the NONf curve, and so forth. The reference points used in deriving these polynomials were the midpoints (15, 18, 21, etc.) of the 11 age intervals used. These four sets of polynomials were then entered into trend analyses. Trend analyses were similarly computed on INC-RESf, NONf, INC-RESa, and NONa scores to specifically test for significant linear and quadratic effects predicted by the model. The unequal distances between the midpoints of the age intervals were taken into account in these analyses.

The trend analyses performed on the four sets of derived polynomials were significant for INC-RESf, T(l, 4281) = 4.16, p <.001; NONf, T(l, 4281) = 2.47, p <.02; and INC-RESf, T(l, 4281)= 3.5l, p < .00l; but not for NONa, T(l, 4281)= -.82, ns. Thus, the age differences

in humor appreciation obtained were consistent with our developmental model for INC-RESf and NONf and for INC-RESa, but not for NONa, Because the NONa curve (shown in Figure 2) appeared to show a U-shaped curve across the first 10 age groups, this analysis was redone, excluding the oldest group. Again, however, the analysis was not significant, T(l, 4246) = 0.33, indicating that the unexpected drop in NONa scores for the 50+ group was not responsible for the failure of the data to conform to the model.

The trend analysis computed on INC-RESf scores showed both a significant linear trend, confirming Hypothesis a, T(l, 4781) = 4.24, $p < .001$, and a significant U-shaped quadratic trend, T(l, 428l) = 2.58, $p < .011$. Thus, the INC-RESf curve shown in. Figure 2 may be best described as the sum of a linear increasing and U-shaped quadratic trend, with the linear component predominating slightly. Although we predicted that the sharpest increase in INC-RESf would occur in the early 30s, it actually occurred in the early 40s. In an equally unexpected finding, INC-RESf scores dropped during the teens.

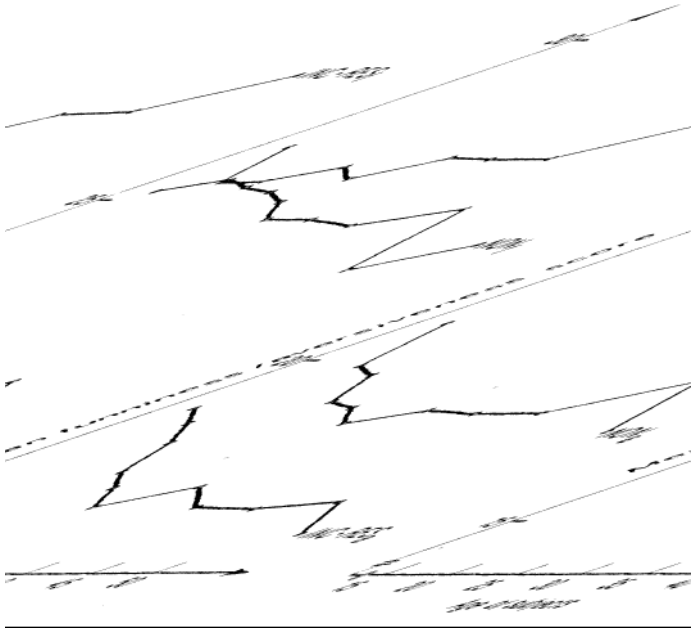

Figure 2. Development of four different aspects of humor appreciation across the life span. (INC-RES* = funniness of incongruity-resolution humor, NON*= funniness of nonsense humor; NON* = aversiveness of nonsense humor; INC-RES* = aversiveness of incongruity-resolution humor.)

The trend analysis performed on the NONf scores revealed a significant decreasing linear trend, T(l, 428l) = -3.93, $p < .001$, but a nonsignificant quadratic effect, T(l, 4281) = 0.14. Thus, although the polynomial test demonstrated a close match of the data to our model, no support was obtained for a mild inverted-U curve. Instead of an increase in NONf occurring among progressively older groups from adolescence through the 20s, a gradual decrease in funniness occurred from the late teens on into groups in their 40s.

A significant decreasing linear trend was obtained for INC-RESa scores, T(l, 4281) = -5.05, $p < .001$, supporting Hypothesis c. The fact that the quadratic trend was also significant, T(l, 4281) = 2.35, $p < .02$, reflects the fact that the steep decrease in INC-RESa scores up to the early 30s is followed by a generally slower decrease thereafter.

Finally, the trend analysis computed on NONa scores produced both a significant decreasing linear trend, T(l, 428l) = -2.95, $p < .005$, and a significant quadratic trend, T(l, 4281) = 2.65, $p < .01$. The positive sign of the T obtained for the quadratic effect shows that the significant curvilinear relationship occurred for the first 10 groups, not the last 3 groups.

## Additional Assessments of SP

A 2 x 11 (Sex x Age Level) ANOVA was computed on SP scores based on the four direct comparisons of funniness and aversiveness of incongruity-resolution and nonsense humor. A significant age main effect was obtained, $F(10, 4270) = 4.18$, $p \leq .001$ * but the sex main effect, $F(1, 4270) = 1.57$, and Age x Sex interaction effect, $F(10, 4270) = .95$* were not significant. Table 3 shows descriptive data for SPS. The mean SP scores indicated that subjects failed to judge nonsense humor as funnier than incongruity-resolution humor at any age level. The preference for incongruity-resolution humor was weakest at ages 20-22, becoming progressively stronger both with decreasing and increasing (especially in. the 30s and 40s) age from that point.

The same pattern of findings emerged with the SPI measures, which indirectly assess relative funniness and aversiveness of incongruity-resolution versus nonsense humor. These funniness and aversiveness SPIS were highly correlated with each other ($r = .92$, $p \leq .001$) and with the SP comparison ($r = .93$, $p < .001$, for SPIf; $r = .80$, $p \leq .01$, for SPIa). Thus, subjects who found incongruity-resolution humor funnier showed a strong tendency to also find nonsense humor more aversive. The latter two correlations indicated that the two approaches were equally effective in demonstrating the general preference for incongruity-resolution humor.

## The Role of Age Differences in Conservatism

The model depicted in. Figure 1 is based partly on the position, that age-related changes in conservatism are responsible for the predicted developmental changes in humor appreciation. A 2 x 11 (Sex x Age) ANOVA computed on the conservatism index scores yielded a significant age main effect, $F(10, 4270) = 6.11$, $p \leq .001$. As shown in Table 3, these scores decreased from middle to late adolescence, then increased slightly in the early 20s. After a period of stability in the 20s and early 30s, they increased sharply in the late 30s and continued to increase thereafter. No significant Sex effect or Age x Sex interaction effect was obtained.

Table 3. Structure-Preference (SP) Scores, Conservatism Index, and Structure-Preference Indices for Funniness (F) and Aversiveness (A)

| | | SP score | | SP index | | Conservatism index | |
|---|---|---|---|---|---|---|---|
| Age (years) | n | M | SD | F | A | M | SP |
| 14-16 | 691 | 13.70 | 2.67 | 1.33 | 2.61 | -0.0181 | 1.0629 |
| 17-19 | 1.239 | 13.21 | 2.75 | +0.07 | 1.82 | -0.1263 | 1.0574 |
| 20-22 | 505 | 13.05 | 2.86 | 0.15 | 2.13 | -0.0960 | 0.9387 |
| 23-25 | 480 | 13.14 | 2.72 | 0.78 | 2.22 | 0 0262 | 0.9532 |
| 26-28 | 420 | 13.41 | 2.77 | 0.67 | 2.56 | 0.0402 | 0.9209 |
| 29-31 | 318 | 13.44 | 3.20 | 1.97 | 2.61 | 0.0625 | 0.9085 |
| 32-35 | 268 | 13.49 | 3.14 | 1.92 | 2.44 | 0.0422 | 0.8937 |
| 36-40 | 168 | 13.79 | 3.00 | 2.09 | 2.92 | 0.2764 | 0.9411 |
| 41-45 | 109 | 14.13 | 2.66 | 2.95 | 3.00 | 0.4301 | 0.8190 |
| 46-50 | 57 | 14.56 | 2.74 | 4.96 | 3.76 | 0.5677 | 0.9938 |
| 50+ | 37 | 15.62 | 2.34 | 5.27 | 3.24 | 0.8660 | 0.8652 |

Two types of analyses were computed to determine the extent to which age differences in conservatism were parallel to those in humor appreciation. First, four product-moment correlations were computed between the conservatism index and each of the humor-

appreciation measures, with the means for the 11 age groups used as data points. As expected, the correlations were highly significant for INC-RESf(r = .95, p <.001) and NONf (r = -.82, p < .01). This relationship was also significant for INC-RESa (r = -.76, p <.01) but not for NONa (r = -.50, ns).

Second, four analyses were performed to determine the extent to which age differences in conservatism accounted for the variance in humor-appreciation scores between the age groups. The means of the conservatism scores were receded (M = 0) and used as dummy predictors in a trend analysis. As expected, this contrast was significant for INC-RESf, T(l, 4281) = 4.16, p < .001, and accounted for 90.5% of the variance associated with the age-level main effect for INC-RESf, The residual effect was not significant, indicating that no systematic differences between the age groups existed after partialing out the effects of conservatism. This contrast was also significant for NONf, T(l, 4231) = -3.10, p <.001, with conservatism accounting for 75% of the variance associated with the NONf main effect. Although the contrast was also significant for INC-RESa scores, T(l, 428l) = -3.69, p < .001. only 27% of the variance associated with the NONf age main effect was explained. Finally, the contrast involving NONa scores was not significant, T(l, 428l) = 1.87, with only 18.8% of the age-related NONa score variance explained.

This pattern of prediction was expected. Prior research suggested that conservatism would be sufficient as a single predictor of INC-RESf scores and that it would strongly predict NONf scores in the reverse direction. Aversiveness of both forms of humor, on the other hand, was expected to be significantly influenced by several additional personality variables. Degree of neuroticism, for example, should play a major role in deter-mining the extent of negative emotion triggered by a cartoon or joke.

A similar analysis was used to determine the extent to which age trends in SP scores could be accounted for by differences in level of conservatism. This contrast was highly significant, T(l, 4278) = 6.13, p <.001, with conservatism scores accounting for 91.8% of the age-related variance in SP scores. The lack of a significant residual effect indicated that no significant amount of variance was left unexplained once the effect of conservatism was extracted. A product-moment correlation between the mean conservatism and SP scores across the different age groups was similarly surprisingly high (r = .96, p <.001, N= 11).

Finally, the correlations between the mean conservatism scores and the two sets of mean SPI scores for the 11 age groups indicated that age differences in conservatism were highly correlated with age differences in preference for incongruity-resolution humor, as indicated by both the funniness (r = .95, p < .001) and aversiveness (r = .86, p < .001) measures. This finding strengthens the credibility of the surprising finding that conservatism accounted for 9 1.8% of the variance in preference scores in the direct comparison of the two types of humor. This finding is important because the direct comparison does not permit a differentiation between the funniness and aversiveness components of humor appreciation. Only the indirect SPI clearly shows that conservatism predicts preference for the incongruity-resolution versus nonsense structure of humor for both the positive and negative components of appreciation.

## DISCUSSION

The cross-sectional age differences found in this study are consistent with the developmental model advanced by McGhee et al. (1990) for INC-RESf, NONf, and INC-RESa but suggest that the model may need to be modified with respect to NONa, The trend analyses performed on the derived polynomials showed that only the age differences in NONa scores failed to match the model.

The trend analyses computed on the humor-appreciation scores themselves permit a more refined description of the linear and curvilinear trends implicit in the model. Thus, for

example, although the predicted linear increase in INC-RESf scores beginning in the late 20s or early 30s was obtained, an even sharper increase occurred in the early 40s. The data also suggest that the curvilinear component of age differences in INC-RESf scores may be stronger than we had predicted. This was a result of the relatively high INC-RESf scores obtained by the 14- to 16-year-old group.

The fact that the sharpest increase in INC-RESf scores occurred a decade later than predicted appeared to result from the fact that the sharpest increase in conservatism also occurred later (late 30s and early 40s) than we had expected. The link established in prior research between INC-RESf and conservatism (Ruch, 1981,1984,1986; Ruch & Hehl, 1983a, 1983b, 1986a, 1986b) was strongly supported in this study, as shown by the .95 correlation between INC-RESf and conservatism scores across the different age groups, and the fact that trend analyses showed that conservatism scores accounted for more than 90% of the variance in both INC-RESf scores and the SP scores resulting from a direct comparison of incongruity-resolution and nonsense humor. Because the trend analyses showed that no variation in INC-RESf scores remained after age-related conservatism effects were removed, this finding is consistent with McGhee et al. (1990) view that the developmental changes in conservatism are responsible for increased enjoyment of incongruity-resolution humor with increasing age. Given the absence of longitudinal data concerning age differences in conservatism, however, no conclusions can be drawn about whether developmental changes in conservatism might account for such changes in humor appreciation.

Conservatism is only one (along with intolerance of ambiguity and sensation seeking) of the key personality dimensions underlying our developmental model. Moreover, as noted earlier, the fundamental determinant of these behaviors appears to be a general tendency to enjoy and seek out or to dislike and avoid various forms of stimulus uncertainty For example, according to Wilson's (1973) dynamic theory of conservatism. conservatives avoid both stimulus and response uncertainty. They prefer structured and simple stimuli that are well-known and certain or safe. This is precisely why we expected them to enjoy incongruity-resolution humor but not nonsense humor. In the former case, everything is clear after the punchline. Nonsense humor, however, leaves one in a state of uncertainty be-cause it cannot be completely resolved.

It is important to note that whereas the polynomial test revealed that the data for age differences in funniness of nonsense humor matched our developmental model, no support was obtained for the predicted mild inverted-U curve. Rather, the data point toward only a linear decrease in NONf as a function of increasing age.

We had expected NONf to be highest among subjects in their 20s, because this is when venturesomeness is highest (Eysenck, Basting. & Pearson. 1984; Eysenck, Pearson, Easting, & Allsopp, 1985). Venturesomeness comprises tendencies to take risks, such as enjoying risky sports, taking risks in general, and welcoming new and exciting sensations and experiences (even if they are unconventional or a little frightening). Because nonsense humor generally contains elements of oddity, absurdity, unexpectedness, or strangeness, this kind of openness to unconventional experiences and sensations can be expected to predict enjoyment of such unconventional humor. In fact, subjects between their mid-teens and mid-20s all showed heightened NONf Beyond this point, it slowly became less funny with progressive age. This slow decrease in funniness of nonsense among older groups is consistent with pilot data obtained for middle-aged adults by Ruch and Hehl (1985) .

Figure 2 and Table 2 show that before ages 29-31, all age groups (except the 14- to 16-year-olds, who found incongruity-resolution humor funnier than nonsense humor) judged the two humor structures comparably funny Starting in the late 20s, however, incongruity-resolution humor increased and nonsense humor decreased in funniness among progressively older groups. This trend was even stronger among subjects in their 40s. A correlation of-.70

was obtained between the two sets of mean funniness scores across the age groups. indicating the strong contrast in the pattern of age-related differences. This contrast is also evident in the fact that age-related differences in conservatism accounted for 90.5% and 75% of the age-related differences in INC-RESf and NONf scores, respectively, but with opposing signs. That is, the liberal or negative pole of the conservatism measure was associated with enjoyment of nonsense humor, but the conservative or positive pole predicted enjoyment of incongruity-resolution humor. These findings are consistent with our contention that with increasing age during the adult years. the incongruity-resolution humor structure becomes increasingly preferred to the nonsense structure, This change, in our view, is the inevitable outcome of underlying personality changes that progressively lead the individual to prefer stimuli and situations associated with less subjective uncertainty.

Both the polynomial test and the trend analysis showed that age differences in INC-RESa scores were consistent with our developmental model. Although the significant linear decrease in INC-RESa scores across the 11 age groups was expected, the significant U-shaped quadratic trend was not. The latter trend reflects the fact that the age-related decrease in INC-RESa scores was relatively steep up to age 30, but very gradual during the 30s and 40s.

The polynomial test computed on. NONa scores suggested that these data did not match our developmental model. The trend analysis of NONa scores, however, yielded a significant quadratic relationship. After an initial peak in the NONa index among 14-to 16-year-olds, aversiveness dropped and then subsequently rose again to reach another peak among subjects in. their late 40s.

The linear trend for NONa scores was also significant, and the fact that this was a decreasing rather than an. increasing linear trend. as shown in. our model, may account for the failure of the derived polynomial test to support the model. Prior research offered no basis for predicting either the high NONa scores obtained by teenagers or the steepness of the drop in. NONa between. the mid-teens and age 30. The fact that the trend analysis of the NONa scores themselves revealed a significant U-shaped pattern suggests chat our model was not grossly in error. Perhaps the model should simply be modified to include a steeper initial drop in NONa scores, followed by a period of stability during the 30s and early 40s, and a milder eventual increase in. NONa than we had initially predicted.

On the other hand, Ruch and Hehl (1985) reported correlations between age and NONa scores for nine different samples (sample sizes ranged from 49 to 156) and found only one significant ($r = -.29$) relationship among young adults that was consistent with the findings of this study. Four studies yielded significant positive relationships across varying age ranges of adults, and four others found no significant relationship. Thus, the appropriate shape of a projected curve for the development of aversiveness of nonsense humor remains uncertain. In deriving the hypothesis for NONa, we combined several predictors, including those linked to both SP (conservatism and sensation seeking) and general aversiveness of humor apart from structure (neurotics and tendermindedness). Failure to support the model for NONa, then. may simply reflect the greater number of predictors used for this part of the model. Whereas conservatism and tendermindedness generally increase with age. neurotics decreases and then stabilizes. and sensation seeking generally decreases throughout adulthood after a peak during adolescence. Thus. determining the appropriate weighting of these factors is difficult.

We had expected nonsense humor to be more aversive among older than younger subjects, and this was not the case. In fact, the somewhat parallel curves obtained for NONa and INC-RESa suggest that the differential pattern of change in appreciation of the two humor structures predicted and obtained for funniness (the positive aspect of appreciation) may not hold for aversiveness (the negative aspect of appreciation). Rather. both sets of aversiveness scores decreased among progressively older subjects in a manner approximating what we had

expected for INC-RESa scores. Nonsense humor was always viewed as more aversive than incongruity-resolution humor (a finding confirmed by direct comparison of aversiveness of incongruity-resolution and nonsense jokes and cartoons), as predicted, but both forms of humor became progressively less aversive among older subjects during the teens and 20s before tapering off to a relatively stable level of aversiveness thereafter.

In general. the findings for NONa and INC-RESa are consistent with age-related trends in the most potent predictors of general aversiveness of humor, namely emotional liability or neurotics, anxiety, and depressivity, which also progressively decrease among older age groups (see Hehl & Ruch, 1985). Eysenck, Eysenck, and Barrett (1985) showed that the decrease in neurotics is especially strong in. adolescence. Further research using subjects in. their 40s and 50s will be required to resolve the question of whether nonsense humor becomes increasingly aversive among older individuals within this age range, as our model predicts. or whether both incongruity-resolution and nonsense humor become progressively less aversive throughout the adult years.

The large number of subjects tested is a major strength of this study However, the sample size was small in the last two age groups. Thus. future studies along these lines should give special attention to age differences in the late 40s and beyond. Our model suggests that (with the exception. of aversiveness of non-sense) the kinds of trends established here should continue into the 60s.

This study of course, was a cross-sectional study, not a longitudinal one. Thus, although we have demonstrated age differences, these differences may simply reflect cohort differences instead of real developmental changes. Our older subjects may have always been more conservative and less sensation. seeking or have always found less pleasure than younger cohort groups in stimulus and response uncertainty. Our findings do not confirm our model, then, even though they are consistent with it, The next step is clearly to undertake a short-term longitudinal study to show that genuine developmental changes follow a similar pattern. But it is essential to note that longitudinal studies of humor pose special problems; namely the same cartoon cannot be presented twice to the same subject, because humorous events are generally less funny when repeated. Thus, parallel forms of humor stimuli are required, in which prior research has demonstrated their comparability in terms of potential funniness and aversiveness for the age groups to be sampled. To this point, Ruch and Hehl (1985) have developed two such comparable forms for adolescents and young adults, but their comparability has not been established across the adult years. Presumably, however, three additional parallel forms would be required for a short-term longitudinal study, assuming a testing session every year or two.

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