HUMOUR AND PROVERB COMPREHENSION AS RELATED TO HUMOUR PRODUCTION ABILITY

by

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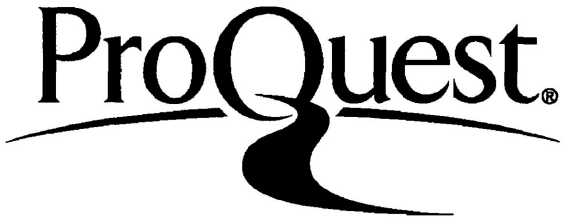

Abstract

This study attempted to determine the relationship between the ability to comprehend humour and the ability to produce it. Also of interest here is the relationship of riddle-solving ability to other humour measures as well as the relationship of proverb comprehension to humour comprehension and to humour production ability. The above relationships were determined through the relationship among seven tests. Humour comprehension was measured by way of a cartoon comprehension test and a joke endings test; and the ability to produce humour was measured by a riddles test, a 'droodles' test, a modified version of the Rosenzweig Picture Frustration Study, and a provide-a-caption test for cartoons.

Ten male and 16 female Introductory Psychology students participated in the study, with seven additional students functioning as judges. Test data were analysed by use of Spearman rank-order correlations, Pearson correlations and a factor analysis. Statistically significant relationships were obtained between:

1) the abilities to comprehend and produce humour, $p=.001$.

2) the abilities to comprehend humour and proverbs, p=.003.

3) the abilities to comprehend proverbs and produce humour, p=.005.

The first of these findings was discussed in terms of its support for Koestler's suggestion that a relationship exists between the abilities to comprehend and produce humour, and in terms of the implications for the broader question of humour's dimensionality. Also, a second interpretation, examining the possibility of other factors influencing the above relationship was put forward. The second finding was seen as supportive of Overlade's previous conclusions stressing the importance of abstraction ability to the comprehension of humour. The third finding was viewed in terms of its implications for a broader comprehension-production relationship.

Koestler's contention that 'every joke contains an element of the riddle which the listener must solve' was not supported in that a significant relationship was not found between riddle-solving ability and other humour measures.

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Theories of Humour

Bergson (1911) once noted that the question of the meaning of laughter has puzzled great minds from Aristotle onwards. These many inquiries have resulted in a host of different speculations concerning the nature of humour. Fortunately, Keith-Spiegel (1972) has provided us with an excellent review of humour theories and this author is indebted to her for the following brief discussion. For the most part grouped 'categories' of humour theories will be discussed here due to limitations of space.

According to Keith-Spiegel, biological, instinctual and evolutional theories of humour can be grouped together in that they commonly view laughter and humour potentials as "built-in" to the nervous mechanism of the organism as well as serving some adaptive function. From the biological viewpoint humour and laughter are seen as having positive physiological effects on the body. Among those emphasizing these biological factors are Spencer (1860) and Darwin (1872).

Some investigators believe laughter to be an instinct (Eastman, 1921; Gregory, 1924). Others stress its 'adaptive' features either as serving a communicative function (McComas, 1923; Hayworth, 1928) or as

a "relic of struggling, biting, physical attack and ultimate conquest" (Keith-Spiegel, 1972 p.6) which eventually became pleasurable as it blended with sympathy and affection (Gregory, 1924; Rapp, 1949).

"Superiority" theories of humour are rooted in the laughter of triumph over other people or circumstances. The humourous experience here results as a function of a favorable comparison of oneself to the less fortunate. As Keith-Spiegel (1972) notes, "according to the principle of superiority, mockery, ridicule, and laughter at the foolish actions of others are central to the humour experience." (p.6). Proponents of this type of theory include Aristotle (1895); Plato (1871); Hobbes (1651); Bergson (1911); Ludovici (1932); Leacock (1937); and Rapp (1947, 1949). However, as Keith-Spiegel points out, many theorists who include the element of superiority as part of humour do not necessarily believe that laughter is always contemptuous or scornful but rather that it may be combined with sympathy, congeniality, empathy and geniality (Bain, 1888); Carpenter, (1922); Rapp (1949).

According to Keith-Spiegel, (1972) "humour arising from disjointed, ill suited pairings of ideas or situations or presentations of ideas or situations

that are divergent from habitual customs form the bases of incongruity theories" (p.7). Leacock (1935) for instance, illustrates this approach in describing humour as "the contrast between a thing as it is or ought to be and a thing smashed out of shape, as it ought not to be" (Keith-Spiegel, p.8). Along the same lines we find Kant's definition of laughter as "an affection arising from the sudden transformation of a strained expectation into nothing" (as quoted by Keith-Spiegel, 1972, p.8). The more noteworthy of incongruity theorists include Kant (1790), Schopenhauer (1819), Spencer (1860) and more recently Bergson (1911), Leacock (1935), Willmann (1940) and Koestler (1964).

As Keith-Spiegel has noted, several theorists have emphasized the role of surprise, shock, suddenness or unexpectedness as a necessary (though not necessarily sufficient) element in experiencing humour. She also brings to our attention the similarities between the concepts of surprise and incongruity in that "both involve an instantaneous breaking up of one's routine course of thought or action" (p.9); and thus accounts for the blend of these concepts in several theories of humour. Among authors stressing the presence of surprise or suddenness as at least one essen-

tial ingredient to the humour experience are Descartes (1649), Willmann (1940), Hobbes (1651), Darwin (1872), and Sully (1902).

The idea behind "ambivalence" theories of humour is that "laughter results when the individual simultaneously experiences incompatible emotions or feelings" (Keith-Spiegel, 1972 p.10). Among those sharing this view in one form or another are Descartes (1649), Greig (1923), Winterstein (1934), Gregory (1924), Willmann (1940) and Eastman (1921).

"Release" and "relief" theories place humour in the role of "affording relief from strain or constraint, or releasing excess tension "(Keith-Spiegel, p.10). This 'excess energy' view of humour has been incorporated into several humour theories including those of Lipps (1898), Dewey (1894), Bergson (1911) and Rapp (1947).

"Configurational" theories of humour share in the view that "humour is experienced when elements originally perceived as unrelated suddenly fall into place" (Keith-Spiegel, p.11). Similar, in that each stresses the cognitive and perceptual attributes of humour, the main difference between the configurational and incongruity approaches lies in the point at which humour emerges. As Keith-Spiegel points out, in incongruity

theories it is the perception of disjointedness that amuses whereas in configurational theories it is the "sudden insight" or "falling into place" which leads to amusement. Recent configurational theorists have for the most part grounded their humour theories in the broader theoretical model of Gestalt psychology. Among those upholding this approach to humour are Hegel (cited in Schiller, 1938), Maier (1932), Schiller (1938), Scheerer (1948) and Bateson (1953).

In a psychoanalytic approach to humour, Freud (1905, 1928) maintained that, "the ludicrous always represents a saving in the expenditure of psychic energy" (Keith-Spiegel, p.13) whether it be in the expenditure of thought as in the comic, of inhibition as in wit, or of feeling as in humour. This principle is based on the idea that as energy which has been built up for occupation in certain psychic channels (cathexis) is not or cannot be utilized owing to the censoring action of the superego, it may be pleasurably discharged in laughter (Keith-Spiegel, 1972). Several offshoots of Freud's theory have since been generated among which we find the writings of Winterstein (1934), Kris (1938), Wolfenstein (1951, 1953, 1954), Reik (1954) and Grotjahn (1957) to name a few.

It should be noted here, that the above classifi-

cation of humour theories into distinct categories was carried out for purposes of summarizing the above material only. In fact, much overlap exists among humour theories. While individual explanations tend to stress the importance of certain factors and downplay the importance of others the fact remains that several humour elements (e.g. surprise, incongruity, release and relief) are shared among many humour theories.

It would seem reasonable to assume that any attempt at formulating a general definition of the humour process should take into account the multiplicity of humour elements described above.

Following upon these lines Eysenck (1942) has defined humour as the result of " the sudden, insightful integration of contradictory or incongruous ideas, attitudes or sentiments which are experienced objectively ". (p. 307). He is quick to add that " in each particular case of laughter the orectic aspect too must be considered". (p.307).

In that this definition reflects both the logical structure of humour and its emotional dynamics, it provides us with a well-rounded, tentative formulation for use in the further study of humour phenomena.

Empirical Research

Although there has been much theorizing about humour over the years, the same cannot be said about its empirical study. Past research, for the most part, made use of only one of the four methods of determining one's 'sense of humour' listed by

Eysenck (1943). Until recently, relatively little was known of other aspects of humour including the abilities to understand or to produce humour. However, in the last few years, alternative approaches to humour have been explored (see Goldstein & McGhee, 1972 and Chapman & Foot, 1976, 1977, for an overview of current research trends).

With respect to humour production, early work in this area may be found in the research of Claparede (1934) and Harrower (1932). More recently , however, research in humour production has centered on two main areas; that of humour production's relationship to creativity as well as its relationship to humour appreciation (Koestler, 1964; Babad, 1974; Treadwell, 1970; Singer & Berkowitz, 1972; Brodzinsky & Rubien, 1976; Ferris, 1972; Eysenck, 1972; O'Connell, 1969; Koppel & Sechrest, 1970).

In the former case, the relationship of humour production ability to creative ability would appear to be fairly well explored. Koestler laid the foundation for research in this area in his theoretical works : Insight and Outlook (1949) and The Act of Creation (1964). More recently, Babad (1974) has expressed the view that the same cognitive processes are required in reaching creative solutions as in the generation of humour.

With respect to empirical research, certain authors have noted the presence of a sense of humour in subjects involved with creativity studies (Getzels &

Jackson, 1962; Gordon, 1962) and some humour measures have been included in studies relevant to creativity research (Maddi & Berne, 1962; Guilford, Hertzka & Christensen, 1953). More specifically, researchers have found a significant relationship between humour production and creative abilities (Treadwell, 1970; Singer & Berkowitz (1972); Brodzinsky & Rubien, 1976). Ferris (1972), in a review of research and theory in humour and creativity, maintains that a test of generative humour ought to be a good measure of creative potential. Also assuming the establishment of a humour-creativity relationship, Karlins (1967) began work on a new creativity measure using wit as a means of assessing creativity.

With respect to the relationship of humour appreciation to humour production, results have been contradictory. Eysenck (1972) has stated that in some unpublished work of one of his students little correlation was found between these different ways of expressing one's sense of humour. O'Connell's (1969) results suggested that the ability to produce wit and humour was not closely related to its appreciation. Likewise, Koppel & Sechrest (1970) found evidence supporting the existence of humour appreciation and humour creation as distinct and measurable concepts.

Contrary to these results, Treadwell (1970) found that humour appreciation scores were significantly correlated with her cartoons test score, a measure of humour production ability. Babad (1974) obtained similar results with respect to his humour appreciation and production tests. As such, the relationship of the abilities to appreciate and produce humour remains open to further investigation.

Early interest in humour comprehension centred on the failure of subjects with organic deficit (as well as highly sophisticated and well adjusted individuals) to comprehend cartoons due to intellectual and emotional factors (Levine & Redlich, 1951, 1955, 1960).

More recently, interest in the ability to comprehend humour has come to light with the occurence of what Goldstein, Harman, McGhee and Karasik (1975) have called the third (and present) 'phase' of humour analysis, which stresses cognitive and physiological approaches to humour. Several cognitive explanations of humour are now available, which according to Goldstein et al. (1975) are characterized by : " a) the perception of some incongruity, ambiguity, novelty or complexity in the humour stimulus; and b) the resolution (understanding or cognitive integration) of the stimulus" (Goldstein, et al. p. 60). Authors sharing

this view include Koestler (1964) Shultz (1972) and Suls (1972).

The development of the ability to comprehend humour in children also has recently received much attention (Zigler, Levine & Gould, 1966: Shultz, 1972; McGhee, 1968, 1971, 1974, 1976). For the most part these attempts have centred upon the effect of developmental changes in the conceptual thinking of children on the comprehension and appreciation of various types of humour.

In summary then, recent theories of humour, in keeping with the modern cognitive approach, have placed greater emphasis on the issue of how we understand humour. As we have noted earlier, the issue of humour production ability is also of current concern. However, little is still known of the relationship between these two areas. Concerning this issue, Koestler (1964) has suggested an idea which has not been empirically tested. In his work on the act of creation he states that:

> Every good joke contains an element of the riddle -- it may be childishly simple, or subtle and challenging -- which the listener must solve. By doing so, he is lifted out of his passive role

> and compelled to co-operate, to repeat to some extent the process of inventing the joke, to recreate it in his imagination. (p.86).

Koestler further states that, "The less suggestive and the more implicit the joke the more will the consumer's reactions approximate the producer's whose mental effort he is compelled to recreate" (p.94). In essence then, what Koestler is suggesting is that a certain relationship exists between the ability to understand humour and the ability to produce it. It is the empirical examination of this hypothesis which is of primary concern to the present investigation. From what point of view this problem might best be approached however, must now be considered.

There are two alternatives for approaching this problem. On the one hand, one could examine the processes involved in humour comprehension and determine their degree of similarity to those involved in humour production. It is felt, however, that greater difficulty might be encountered here, since so little is presently known about the basic processes involved.

A preferable alternative to this method would be to determine if individual differences which occur as the result of one process correlate with the individual

differences found in the other. Thus, if as Koestler suggests, the abilities to comprehend and produce humour are related, we might expect an individual who scores high on a measure of humour production ability to also excel in the ability to comprehend humour.

Such an examination of the degree of relationship between different aspects of the humour process, however, leads to a broader question, that of humour's dimensionality. In addressing this matter Eysenck (1972) asks:

> Can we even speak of such a thing as "sense of humor", or are there several different senses involved? When we refer to a person's sense of humor we may mean one of several quite distinct and different things. We may mean that a person with a good sense of humor laughs at the same things we do; this is the <u>conformist</u> meaning of the term. Or we may mean that he laughs a great deal and is easily amused; this is the <u>quantitative</u> meaning of the term. Or we may mean that he is the life and soul of the party, telling funny stories and amusing other people; this is the <u>productive</u>

> meaning of the term. Are these three "senses of humor" usually found in the same person? The answer seems to be NO; in some unpublished work, one of my students found little correlation between these different ways of expressing "sense of humor". (p.xvi).

Leaving open, as he does, the question of how many 'senses' of humour are involved, Eysenck invites the inclusion of other 'senses' which can be shown to constitute one's 'sense of humour'. One such factor would necessarily be the ability to comprehend humour since without it one could hardly appreciate humourous stimuli. In determining then the degree of relationship between the two 'senses' of humour, comprehension and humour production ability, we are in effect providing a partial answer to Eysenck's basic question. One of the purposes of the present study, then, is to explore the dimensionality of humour.

Other areas of interest to this research are the types of relationships existing between proverb comprehension and humour comprehension as well as that between proverb comprehension and humour production.

Fry (1963), in his theory of humour has pointed to the fact that joke content which is implicit lies

on a higher level of abstraction than explicit content such that "getting the joke" requires a certain degree of abstract functioning. Likewise, Redlich, Levine and Sohler (1951, 1960) have made reference to the association of humour comprehension and abstract thought. In their later work they state that "there seems to be little doubt that the comprehension of a humorous cartoon involves a high order of intellectual abstraction " (Redlich & Levine, 1960 p. 25).

Now, the interpretation of proverbs has long been associated with the measurement of abstract functionning. Psychotherapists have made extensive use of Benjamin's (1944) list while more recently, Gorham (1956 a) has constructed a proverbs test where the subject is asked to tell the meaning of a proverb. According to Gorham " for normal subjects, even as young as fifth graders, this request stimulates what Goldstein refers to as the 'abstract attitude' " (Gorham, 1956b p. 435).

In studying the relationship between proverb and humour comprehension Overlade(1954) found these two abilities to be significantly related by way of one's abstraction ability.

Now, if in fact, as hypothesized in this study, the abilities to comprehend and produce humour are related we could further hypothesize that abstraction ability, already identified as a factor in the comprehension of humour may also play a part in the production of humour. This study then , will attempt to replicate Overlade's (1954) finding as well as

study the association between the abilities to comprehend proverbs and produce humour.

Lastly, it is proposed that if, as Koestler (1964) suggests, "every good joke contains an element of the riddle (...) which the listener must solve" (p.86), one could reasonably expect riddle-solving ability to be positively related to humour comprehension ability. Also, since riddle-solving requires the ability to generate humourous answers, we might expect riddle solving ability to be positively related to other measures of humour production ability.

Thus, in line with the above theoretical formulations it is hypothesized that:

1) The ability to comprehend humour will be positively related to the ability to produce it.
2) The ability to answer riddles will be positively related to the ability to comprehend humour.
3) The ability to answer riddles will be positively related to the ability to produce humour.
4) The ability to comprehend proverbs will be positively related to the ability to comprehend humour.
5) The ability to comprehend proverbs will be positively related to the ability to produce humour.

METHOD

Subjects

Twenty-six Introductory psychology students, ranging in age from 18 to 40 years with a mean age of 23, were asked to participate in a testing session of one and one half hours duration. The 10 male and 16 female students were each given two marks towards their final course grade for their participation in this task. Seven additional participants (four male, three female) served as judges. This group consisted of four graduate and three undergraduate students ranging in age from 21 to 25 years with a mean age of 23.

Materials and procedure

The present study made use of the following seven measures.

Humour Production: The subject's ability to generate humour was determined by

1) A Provide-a-Caption Test (P. A. C. T.) requiring the subject to supply as humourous a caption as possible for five cartoons. All drawings had been chosen from the New Yorker magazine and the original captions were removed.

2) A "droodles" test composed of five simple drawings to which subjects added a short humourous description. These stimuli coined 'Droodles' by Roger Price (1954) had been selected from his book The Rich Sardine. An example of the type of answer desired (obtained from this same book) was provided as part of the test instructions (see appendix B).

3) A third measure consisting of 11 items chosen from the Rosenzweig Picture Frustration (P-F) Study (1948). These materials were previously utilized by O'Connell (1969) in assessing the ability to produce wit and humour. As in O'Connell's study, the request "try to be as humourous as possible" was added to the usual instructions.

4) A 'riddles' test comprised of seven riddles for subjects to answer. These riddles were chosen from a number of popular riddles as found in joke books, newspapers and television programs. The first test item here was of little difficulty and was included to help subjects "get started" with this considerably demanding task. This item was not included in test results and served the aforementioned purpose only.

Humour comprehension: Humour comprehension measures were obtained by way of

5) A Cartoon Comprehension Test (C. C. T.) consisting of five cartoons (with or without captions) chosen from various issues of the New Yorker magazine. Cartoons with sexual or aggressive themes were eliminated from this selection since stimuli of this type have been associated with 'failure to understand' humour in certain people (Levine & Redlich, 1955). In this test the subject's task consisted of briefly describing in the space provided what he thought was funny in each of the cartoons.

6) A multiple choice Joke Endings Test (J. E. T.), first used by Overlade (1954), consisting of 12 joke stems, each having four possible endings. The subject is asked to read over the first part of the joke and then decide which ending would make the whole joke the funniest. Scoring procedures for this test were first established by Overlade who determined the 'correct' ending to each item from the judgments of a group of 65 subjects who completed the test. In this way, Overlade found several items which contained an answer chosen significantly more often than second choices and these first choices then became the 'correct' answers.

7) Proverbs: Abstraction ability was measured by way of 12 items selected from Overlade's (1954)

proverbs test. The subject's task is to pick out the one statement out of four which is most unlike the other three. Scoring procedures for this measure were also established by Overlade. The correct answer to each item was obtained through the judgment of 18 trainee and staff psychologists. Items included in the present study had previously shown 78 per cent or greater agreement among judges as to the one proverb most unlike the others of a group.

On all measures, preliminary checkouts with small samples were made to select appropriate test items and to establish time limits. Measures were administered in the following sequence (note that the first, middle, and final tasks were comprehension tasks, while the others involved production of humour) :

1) C. C. T.
2) P. A. C. T.
3) Riddles Test
4) Proverbs Test
5) Modified Rosenzweig P-F Study
6) Droodles Test
7) J. E. T.

Subjects were asked to complete these tests in one of several group sessions held in order to accommodate all participants.

Judging:

Responses from the Provide-a-Caption Test were ranked by a 21 year old male undergraduate student . The Rosenzweig test responses were ranked by two 21 year old female undergraduate students who shared in this task by each ranking one half of the test items.

The Droodles Test responses were ranked by a 25 year old female graduate psychology student. The Riddles test responses were ranked by two 25 year old male graduate psychology students who shared in this task by each ranking one half of the test items.

Responses from the Cartoon Comprehension Test were ranked by a 24 year old male graduate psychology student.

Judges rank-ordered responses on the C. C. T. and those on the four humour production measures, such that low rankings (e.g. 1,2,3) reflected superior task performance and high rankings (e.g. 8,9,10) reflected inferior task performance. This ranking method was chosen (over an alternate approach which assigns higher rankings (e.g. 10,9,8) to superior performance levels and lower rankings (e.g. 3,2,1) to inferior performance levels) in the interest of clarity. It was decided that judges should rank responses in the simplest manner possible. With the possible occurrence of ties between ranks, the number of ranks needed for the ranking of responses for each item is indeterminate.

Raters, therefore, proceeded in a straightforward manner from a fixed rank of '1' (reflecting superior task performance) to as many higher rankings as were needed for any item. Responses judged to be tied in rank received the same rank.

Responses obtained from the C. C. T. were rated according to the judge's assessment of the subject's grasp of the point of the joke. However, the person so charged was instructed to consider equally any explanation which 'fit' the stimuli provided.

Humour products were assessed on the basis of the subject's ability to produce the most humorous answers possible which, as noted earlier, would seem to draw heavily on the subject's capacity for clever and original thought. Also, as subjects were encouraged to provide more than one answer on humour production measures, those items with more than one humour product received a more favourable ranking than single answers of the same quality. Any test items left blank, received the highest ranking of the group.

Scores obtained on the Proverbs and Joke Endings Test reflected the number of correct responses out of 12, chosen by each subject.

For computational purposes, the experimenter transformed the judges' ratings on each test item into

proper ranks ranging from 1 through to 26. The next step involved summing for each of the tests, each subject's rank on each of the test items. These sums were then ranked from 1 through to 26 (on each test) in final preparation for the statistical procedures to follow.

Results

Spearman correlations between ranks obtained on the various humour and proverb tests are presented in Table 1. Although certain tests tend to intercorrelate more strongly than others, with respect to composite test results this matrix points to the conclusion that the abilities to comprehend humour and to produce it are significantly related, (ρ=.68, p=.001). The ability to comprehend proverbs also would seem to be significantly related to humour comprehension, p=.003 and humour production abilities, p=.005. Also noteworthy is the lack of intercorrelation among certain humour tests. We find for instance, little relationship between our two humour comprehension measures and between the riddles test and other individual humour measures. Also, of interest is the fact that our composite measure of humour production correlates significantly with all other measures while our composite measure of comprehension correlates significantly with every measure but the Droodles test.

Pearson product-moment correlations (correcting for the effect of tied ranks on ρ) were performed on the above results (cf. appendix H) however we note that correlations between composite scores were omitted

Table 1

Spearman Rank Order Correlations Among Humour Comprehension Humour Production and Proverb Test Results (N = 26)

		2	3	4	5	6	7	8	9	10
1	Provide-a-Caption Test	.4829**	.3559*	.2995	.3492*	.6026***	.4323*	.7649***	.6700***	.6363***
2	Droodles Test		.3767*	.1107	.3319*	.1373	.1214	.6942***	.3529*	.2600
3	Modified Rosenzweig			.3069	.3878*	.4324*	.4387*	.6910***	.5502**	.5571***
4	Riddles Test				.2340	.2453	.4569**	.5996***	.3038	.4273*
5	Cartoon Comprehension Test					.1510	.2351	.4820**	.7334***	.6286***
6	Joke Endings Test						.5068**	.5100**	.7462***	.7412***
7	Proverbs Test							.4207**	.5200**	.7867***
8	Total Humour Production								.6829***	.6801***
9	Total Humour Comprehension (without proverbs)									.9245***
10	Total Comprehension (with proverbs)									

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

from this table since our data are comprised of rankings of unequal weight and a combination of such values would not yield proper Pearson correlational coefficients. Also, since with the Joke Endings and Proverb tests higher scores have stood for good performance and on the other five humour tests higher rankings have reflected poorer test performance, correlations between these two tests and the other tests were negative. In order to avoid confusion, all correlations are given as positive in Table 3. This gives the equivalent result to that obtained by applying the following formula to the Proverb and Joke Endings Test results:

$$Xc = S - Xr$$

where Xc = calculated score

Xr = raw score

S = sum of highest and lowest score

The matrix of correlations from Table 1, tests 1 to 7, was subjected to a factor analysis. Factor loadings obtained on these tests are presented in Table 2.

Table 2

Varimax Rotated Factor Matrix

Variable	Factor	
	1	2
Provide-a-Caption Test	.54	.51
Droodles Test	.03	.87
Modified Rosenzweig	.50	.40
Riddles Test	.48	.12
Cartoon Comprehension Test	.26	.41
Joke Endings Test	.67	.18
Proverbs Test	.78	.10

These results indicate the presence of two factors. Two interpretations of these factors will be suggested. First, in line with the goal of this study, they could be labelled as Comprehension (factor 1) and Production (factor 2). Difficulties for this interpretation are the facts that the C. C. T., intuitively a comprehension measure, loads more heavily on factor 2 than on factor 1 and the Riddles Test, intuitively a production measure, loads more heavily on factor 1 than on factor 2.

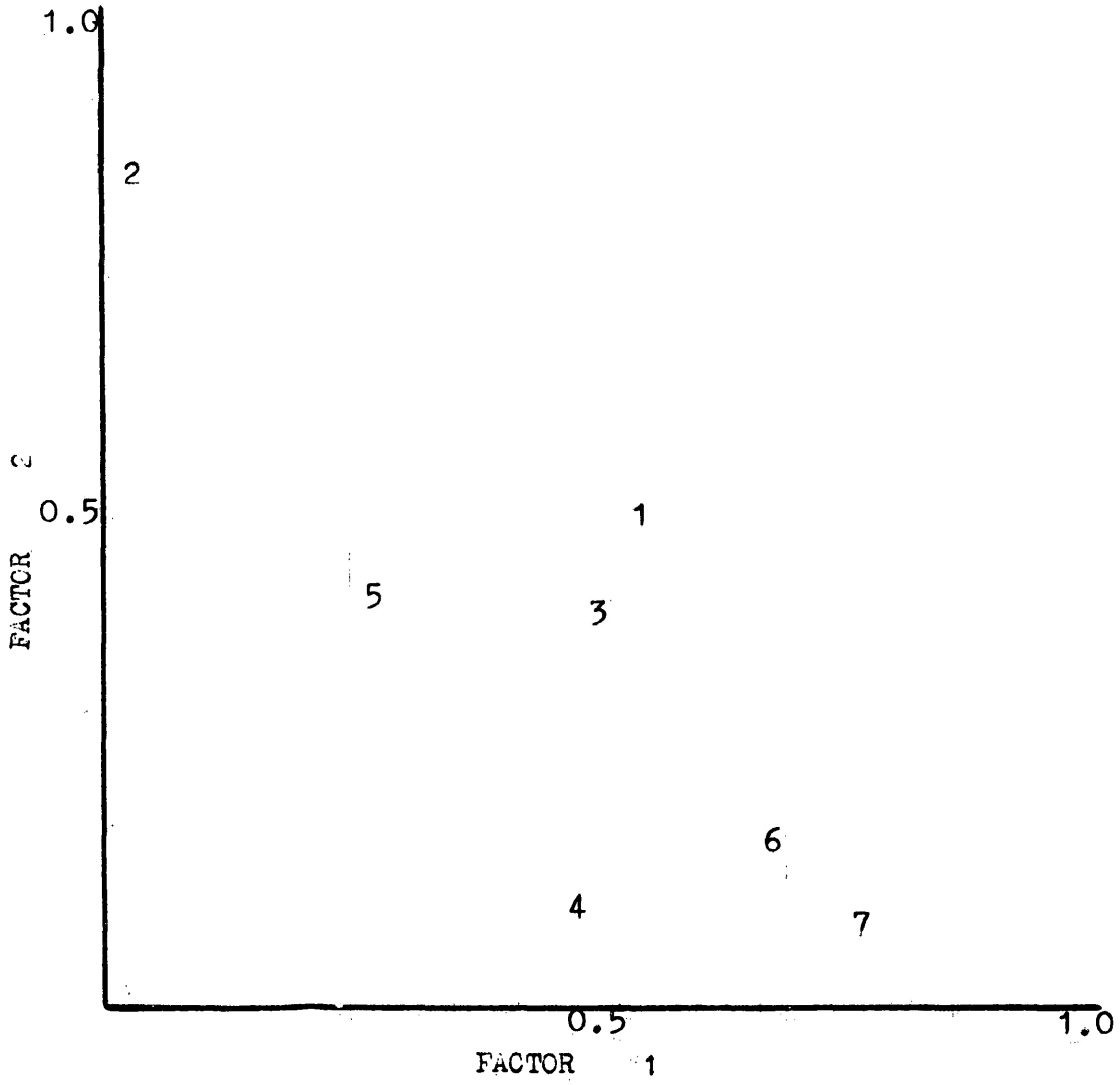
An alternative interpretation is to consider

factor 1 as a Verbal factor, and factor 2 as a Pictorial factor. The fact that the P. A. C. T., Rosenzweig, and C. C. T. load appreciably on both factors appears to fit such an interpretation.

In Figure 1 we see that variable 2 loads high on factor 2 but low on factor 1. The cluster of variables 4, 6 and 7 load high on factor 1 but low on factor 2. Variables 1, 3 and 5 unlike the others, load considerably on both factors.

Figure 1

Graph of Rotated Factors



1= Provide-a-Caption Test
2= Droodles Test
3= Modified Rosenzweig
4= Riddles Test
5= Cartoon Comprehension Test
6= Joke Endings Test
7= Proverbs Test

Discussion

The present investigation was primarily aimed at determining the extent of the relationship between the abilities to comprehend and to produce humour. The results of this study would seem to indicate that these abilities are in fact, closely related. This finding however, lends itself to two distinct interpretations.

The first of these is that, as Koestler (1964) has suggested, the processes involved in the comprehension and production of humour are in fact essentially the same, as supported by the above obtained relationship in this study. This finding would also seem to indicate that it is possible to make predictions about individual differences in the comprehension and production of humour. More generally, our results have provided evidence for a uni-dimensional interpretation of humour where humour's various facets combined, form <u>one</u> 'sense of humour'.

It is possible, that the relationship here obtained could have as far-reaching implications as in the areas of 'speech perception' or the 'simulation of psychological processes' since comprehension-production links have been proposed in these areas also.

In the area of speech perception a theory has been proposed wherein the comprehension of speech is intimately bound up with its production. According to the motor theory of speech perception "articulatory movements and their sensory effects mediate between the acoustic stimulus and the event we call perception" (Liberman, 1957, p.122 as quoted by Lane, 1965). Also, stated somewhat differently, we find that "sound discrimination ability is a function of articulation" (Prins, 1962 p.387 as quoted by Lane, 1965). More recent inquiries into the area of verbal comprehension and production have also found these two abilities to be closely related (Kushner & Winitz, 1977; Lopez, 1975).

Within the process of simulation we find a comprehension-production relationship of a much broader base:

> The attempts to simulate psychological processes with machines are motivated in large measure by the desire to test -- or to demonstrate -- the designer's understanding of the theory he espouses. History suggests that man can create almost anything he can visualize clearly. <u>The creation of a model is proof of the clarity of the vision</u>. If

> you understand how a thing works well enough to build your own, then your understanding must be nearly perfect. [underlining mine] (Miller, Galanter & Pribram, 1960).

Thus, the extension of the humour comprehension-production relationship to other areas of research shows promise as a topic for future consideration.

A second interpretation of the present study's findings would be that the correlation obtained was largely due to the presence of a third variable related to the other two.

One such factor could well be that of general intelligence. The influence of general intelligence on the comprehension and production of humour has recently been brought to our attention by Eysenck (1979). Also, while still a matter of controversy, (cf. McGhee, 1968; Anastasi & Schaefer, 1971; Rouffe, 1973) intellectual ability has been found to be related to both humour comprehension (Overlade, 1954; Levine & Redlich, 1960; also see McGhee, 1968) and creative ability (McNemar, 1964; Petukhova, 1976, Martin Blair, Stokes & Armstrong, 1977) the latter of which, as mentioned earlier, has also been found to be significantly related to humour production ability. One could readily make a case, therefore, for the inclusion of intelligence

as a factor affecting the comprehension and production of humour. However, while some findings (Overlade, 1954; Rouffe, 1973, 1975) would seem to indicate that intelligence is indeed a factor affecting one's sense of humour it has not been found to be one of primary import. In studying the relationship of humour comprehension to creative ability, Rouffe (1973, 1975) found a significant relationship between these two abilities which transcended intelligence. Overlade (1954) obtained similar results in his study of humour comprehension and abstraction ability in that, while he found intelligence to be significantly related to humour comprehension ability, the relationship between the above variables remained once the effect of general intelligence on test results was partialled out.

A second factor which could well be contributing to our humour comprehension-production relationship may be that of abstraction ability. In studying the relationship of humour perception to abstraction ability Overlade (1954) concluded that his "experimental results in general support the theoretical position that an ability to abstract the obscure from the obvious in verbal or in configurational material is an important factor in the perception of humour" (Overlade, p.vii). Similarly, the results of the present

investigation have shown the ability to abstract the meaning from proverbial statements to be significantly related to humour comprehension ability.

Furthermore, in its use of Overlade's proverbs test, (which according to Overlade (1954) is a measure of abstraction ability found not to be related to one's level of intelligence) the present study found one's ability to perform on this test to also be significantly related to the ability to produce humour. This finding is in keeping with Harvey, Hunt & Schroder's (1961) position that: "abstract functioning is characterized by greater differentiation, greater flexibility of interpretation, and a greater number of conceptual dimensions" and that "abstract functioning is presumably characterized by (...) greater creativity" (Harvey, Hunt & Schroder, p.331).

Yet another factor could be underlying the humour comprehension-production relationship obtained in this study, that of creative ability. As noted earlier in this study, creative ability has been found to be significantly related to both the comprehension and (Rouffe, 1973, 1975) the production of humour (Treadwell, 1970; Singer & Berkowitz (1972); Brodzinsky & Rubien, 1976).

Thus, creative ability, like abstraction ability

and intellectual ability, could well be contributing to the humour comprehension-production relationship obtained in the present inquiry. It will remain the task of future investigators, however, to determine the effect of these factors (as well as any others which are found to be relevant) on the above relationship.

The results of the above-mentioned factor analysis performed on our matrix of test intercorrelations has shown the Droodles test to be relatively free of the comprehension factor and therefore a considerably pure measure of humour production ability. Thus, the future use of the Droodles test as an instrument for further research in the areas of humour production and creative ability would appear promising.

A lack of correlation between our two measures of humour comprehension was also found. One could speculate here, that these measures might be tapping somewhat different aspects of cognitive functioning with the disparity arising out of the use of differing stimuli on each of the tests; the C. C. T., as mentioned above, consists of pictorial stimuli whereas the J.E.T. makes use of verbal stimuli.

With respect to the relationship of humour comprehension ability to riddle-solving ability, non-significant results were obtained. Similarly, a non-signi-

ficant relationship was found between the riddles test and all measures of humour production ability. This lack of relationship between the riddles test and other humour measures fails to support Koestler's (1964) contention that every joke contains an element of the riddle which must be solved. In keeping with Koestler's theory, one could argue that with certain humourous stimuli, the 'element' of the riddle which each joke contains may be outweighed by the joke's other humour 'elements'. According to Koestler (1964), this would be the case, the more explicit and the more predominantly sexual or aggressive the humour. Such an interpretation however, would not seem applicable in this case since humour materials with explicit or predominantly sexual or predominantly aggressive themes (or some combination of the above) were eliminated from the present study.

Thus, for the moment, we can only conclude that inherent to riddles are elements which differentiate these stimuli from other types of humour. The nature of these elements however, remains to be determined.

It is interesting to note that while Riddles Test results failed to correlate significantly with those of other humour measures, they did in fact correlate significantly with Proverbs Test results. This

finding could perhaps be accounted for in light of the second factor-analytic interpretation put forth in the present study. That is, both of the above measures load heavily on factor 1 , previously labelled as a 'verbal' factor.

Other relationships obtained from this study include those between proverb and humour comprehension and between proverb comprehension and humour production. The first of these is in agreement with the findings of Overlade (1954) and as such, lends support to his previous conclusions.

The significant relationship obtained between the comprehension of proverbs and the production of humour would seem to suggest that, as noted earlier, the comprehension-production relationship obtained in our humour study may well extend beyond the scope of the present investigation.

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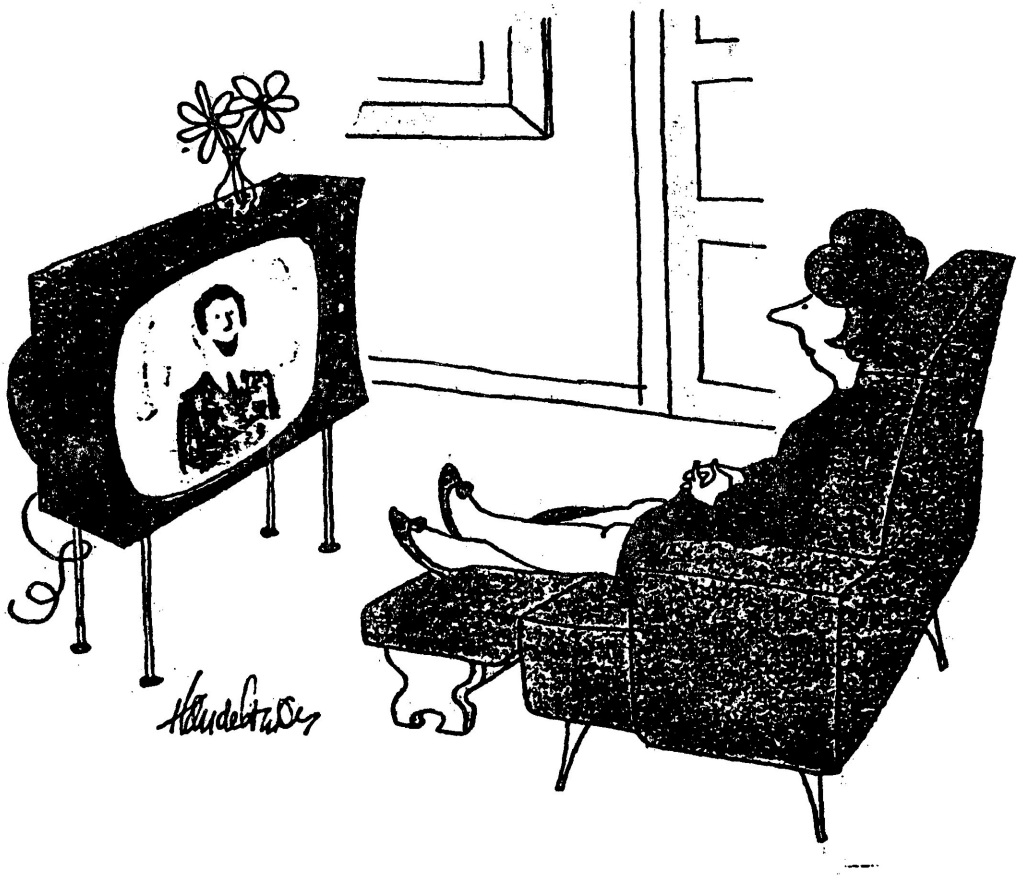
Appendix A

P.A.C.T.

INSTRUCTIONS

On each of the following pages you will find cartoons without captions. You are asked to make up as funny a caption as possible for each cartoon, and to write it down immediately below the cartoon. You are allowed 12½ minutes to complete this task. Try not to leave any out. If you wish you may provide more than one answer. Do not spend too much time on any one cartoon.

27



1.

24

3.

33

4.

5.

Appendix B

DROODLES TEST

Instructions: On each of the following pages you will find a simple drawing. You are asked to describe this drawing in a phrase or two. Try to make your descriptions as humourous as possible. For example, the drawing below could be humourously described as:

"THREE WATERMELONS DOING A TIGHT ROPE ACT"

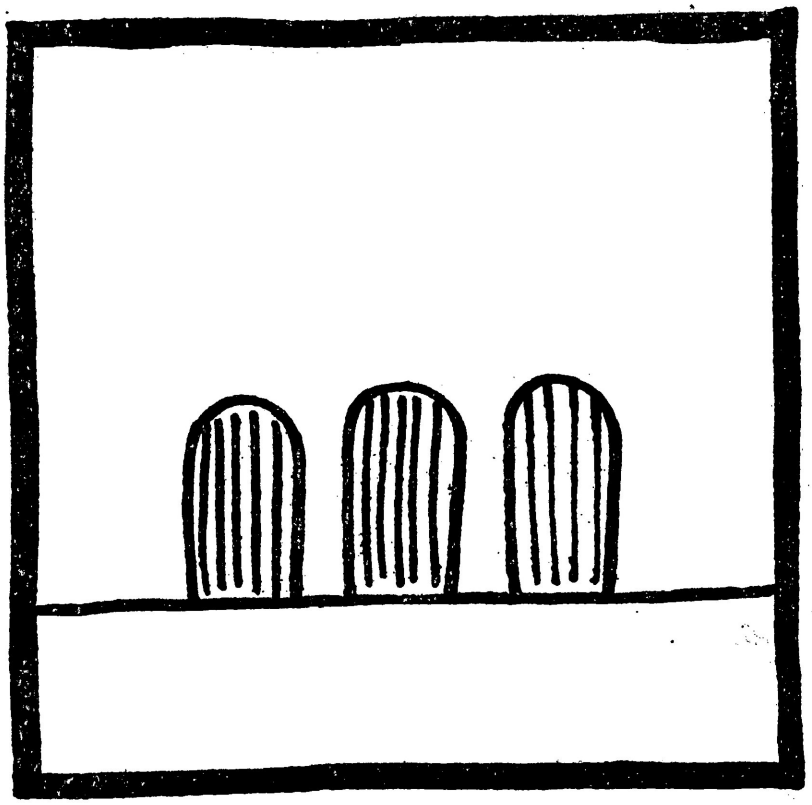
or

"MOUSE HOLES WITH CURTAINS"

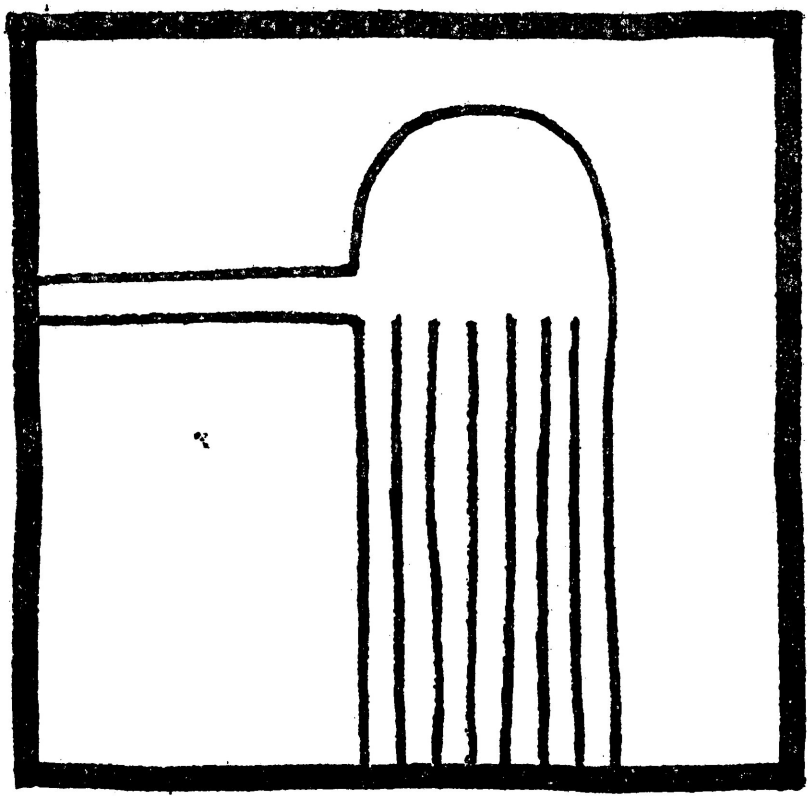
or

"HULA DANCERS TAKING A BOW (REAR VIEW) "

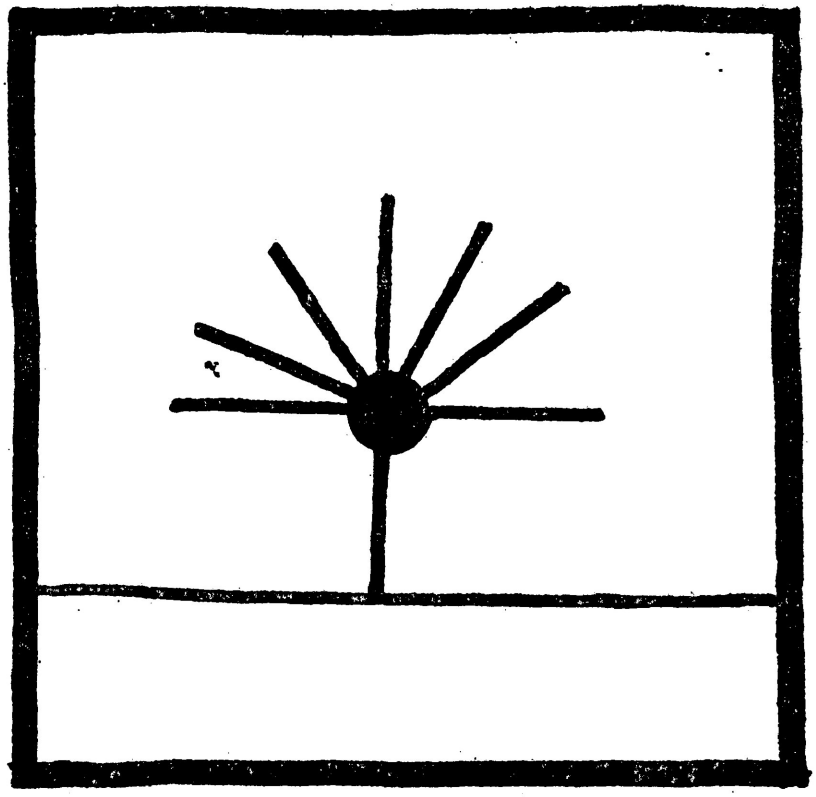
Example:



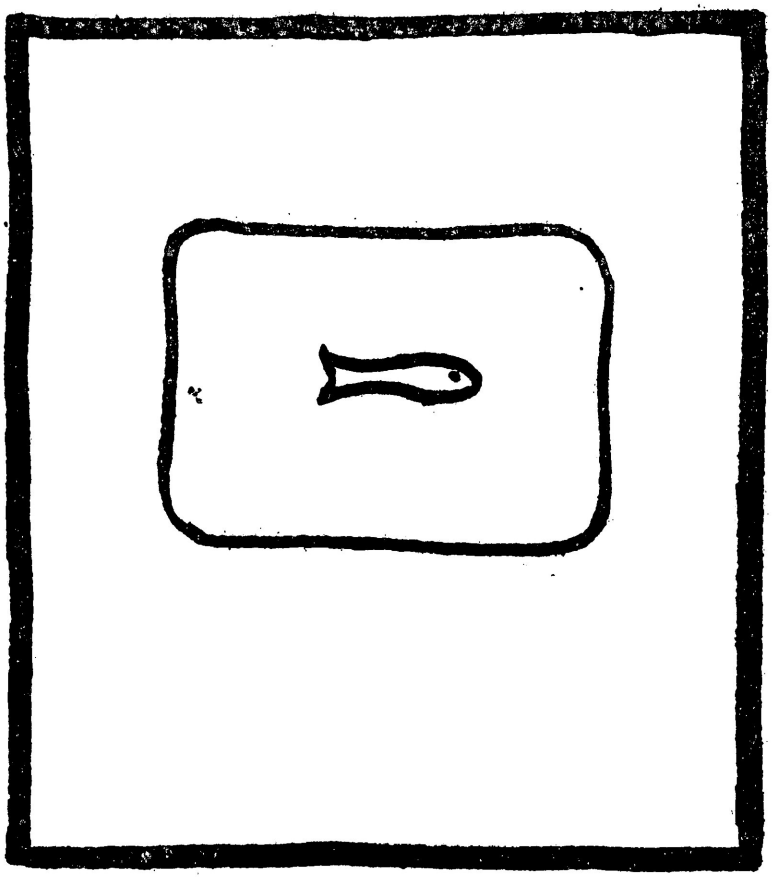
You will be allowed 15 minutes to complete this task. Try not to leave any pages blank. If you wish you may include more than one answer.



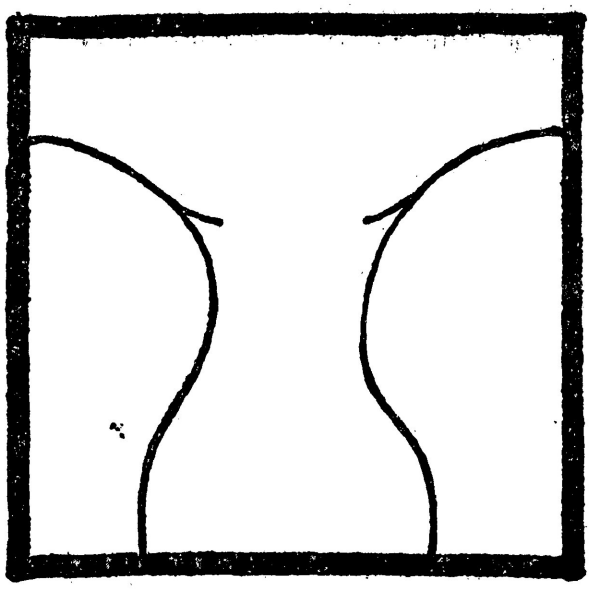
1.



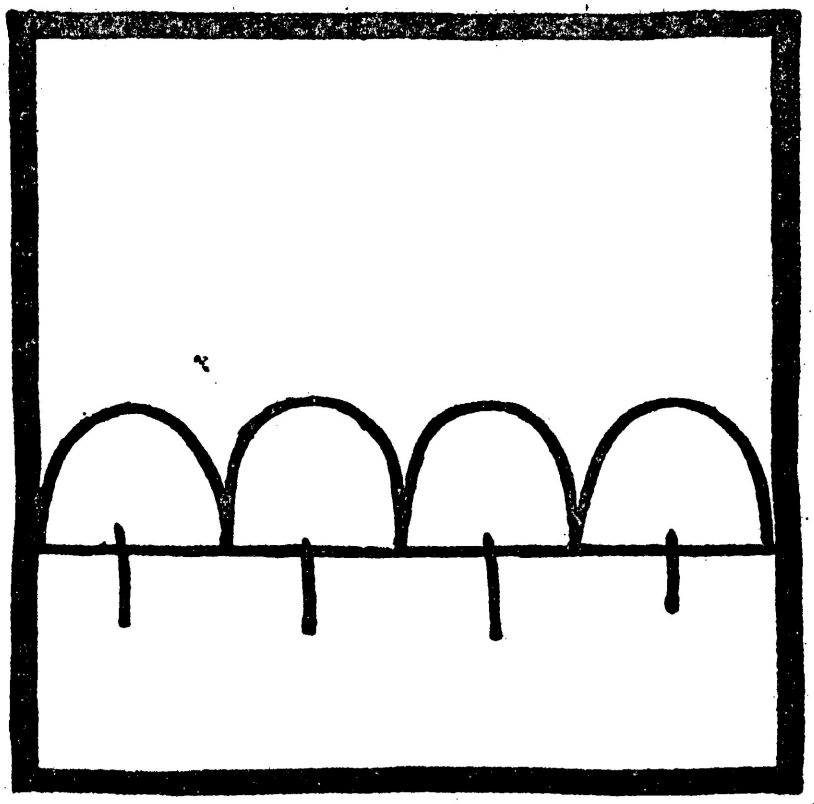
2.



3.



4.



5.

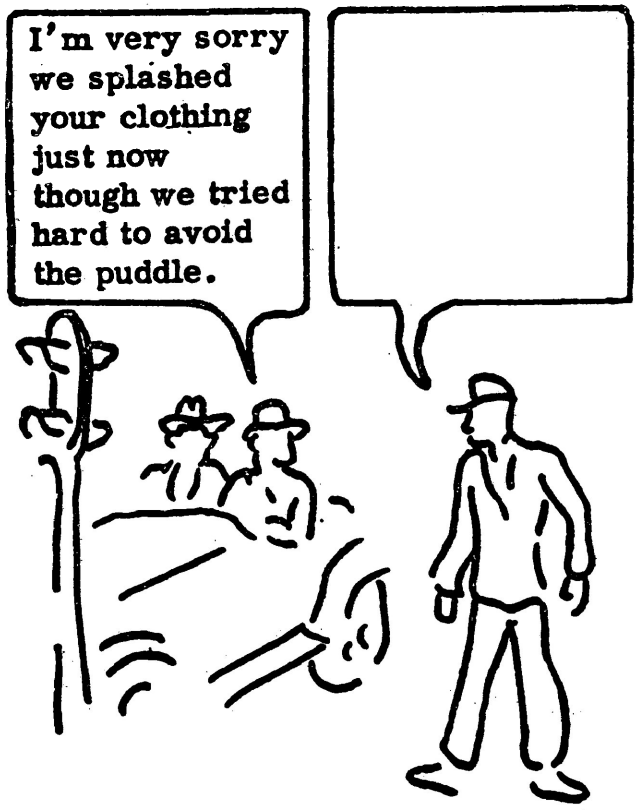
Appendix C

Modified Rosenzweig P-F Study

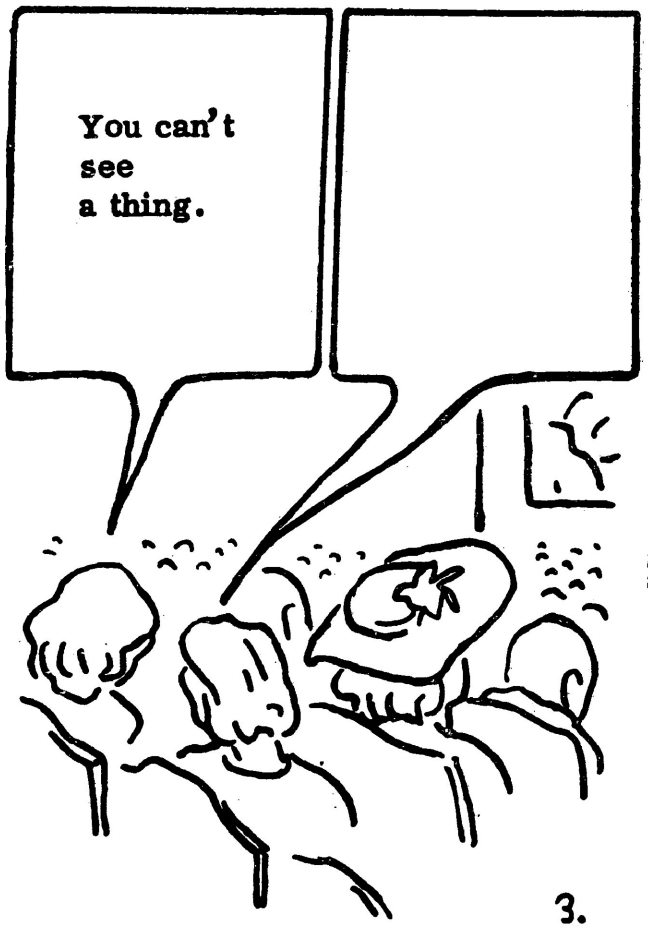
Instructions

In each of the pictures in this leaflet two people are shown talking to each other. The words said by one person are always given. Imagine what the other person in the picture would answer and write your reply in the blank box. Try to be as humourous as possible. If you wish you may include more than one answer. If you are cramped for space do not hesitate to write outside of the blank box.

You are allowed 20 minutes to complete this task. Do not spend too much time on any one question. Try not to leave any boxes blank.


I'm very sorry we splashed your clothing just now though we tried hard to avoid the puddle.

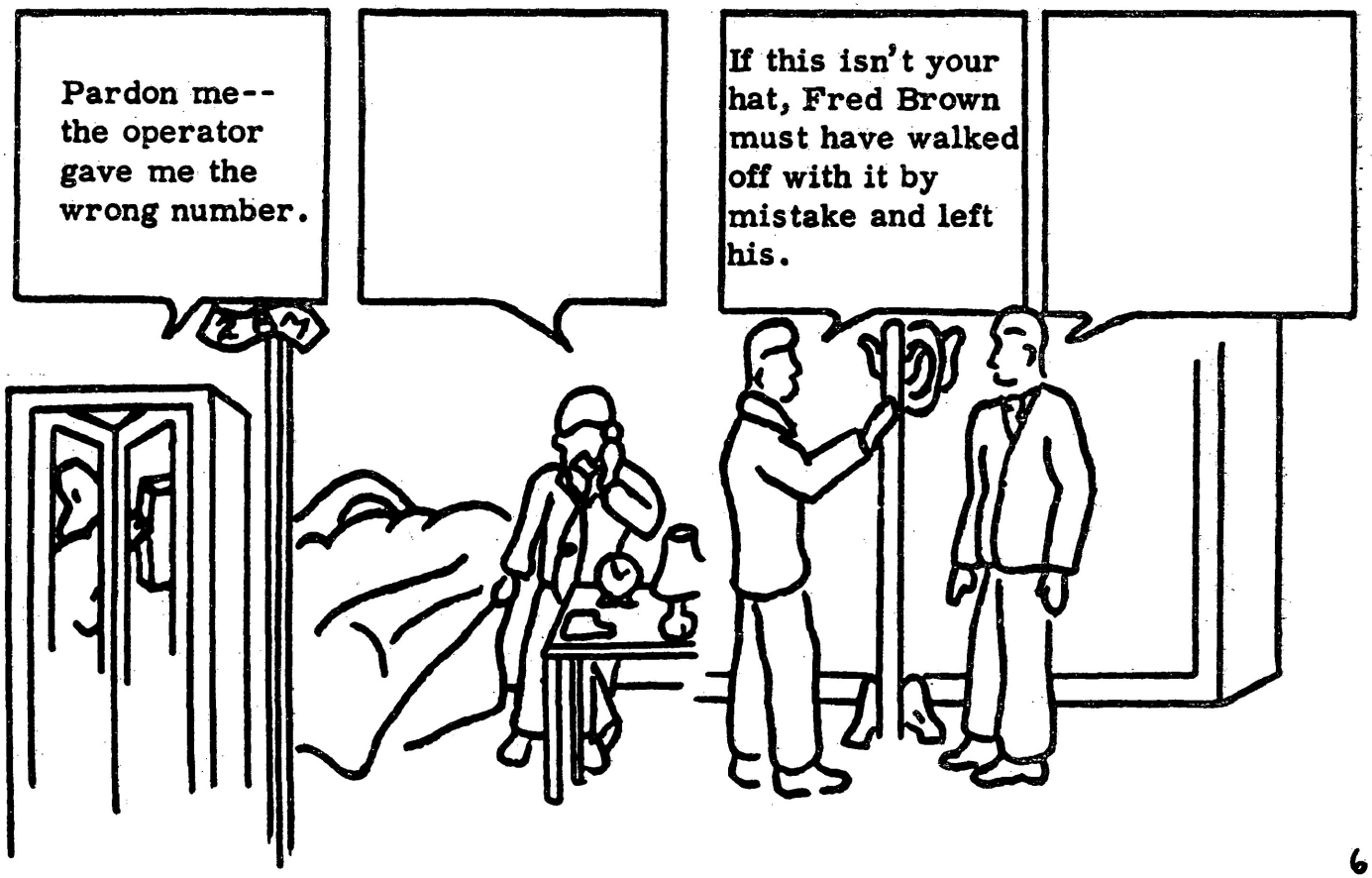

This is the third time I've had to bring back this brand new watch which I bought only a week ago-- it always stops as soon as I get home.
2.


You can't see a thing.

3.

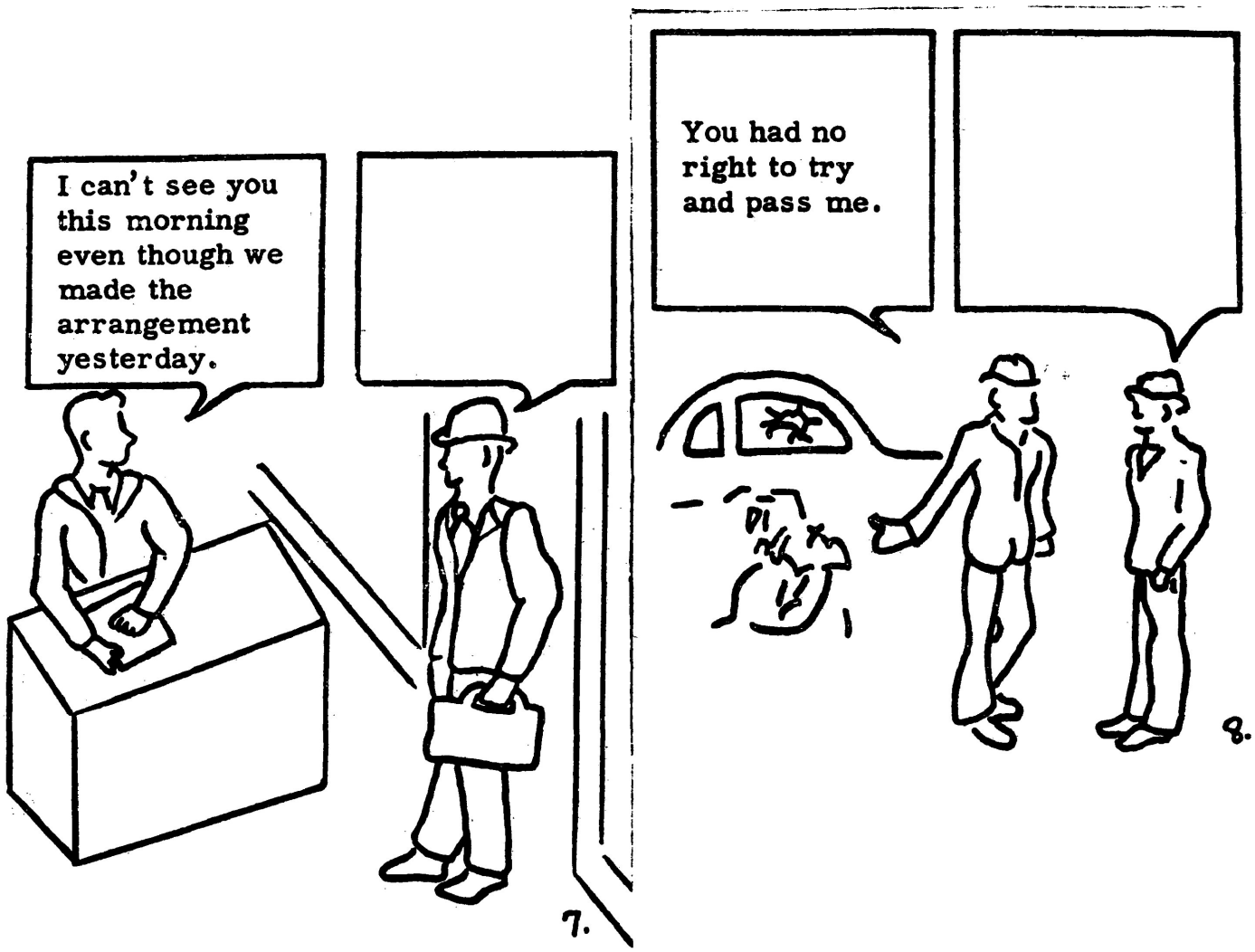

Your girl friend invited me to the dance tonight--she said you weren't going.

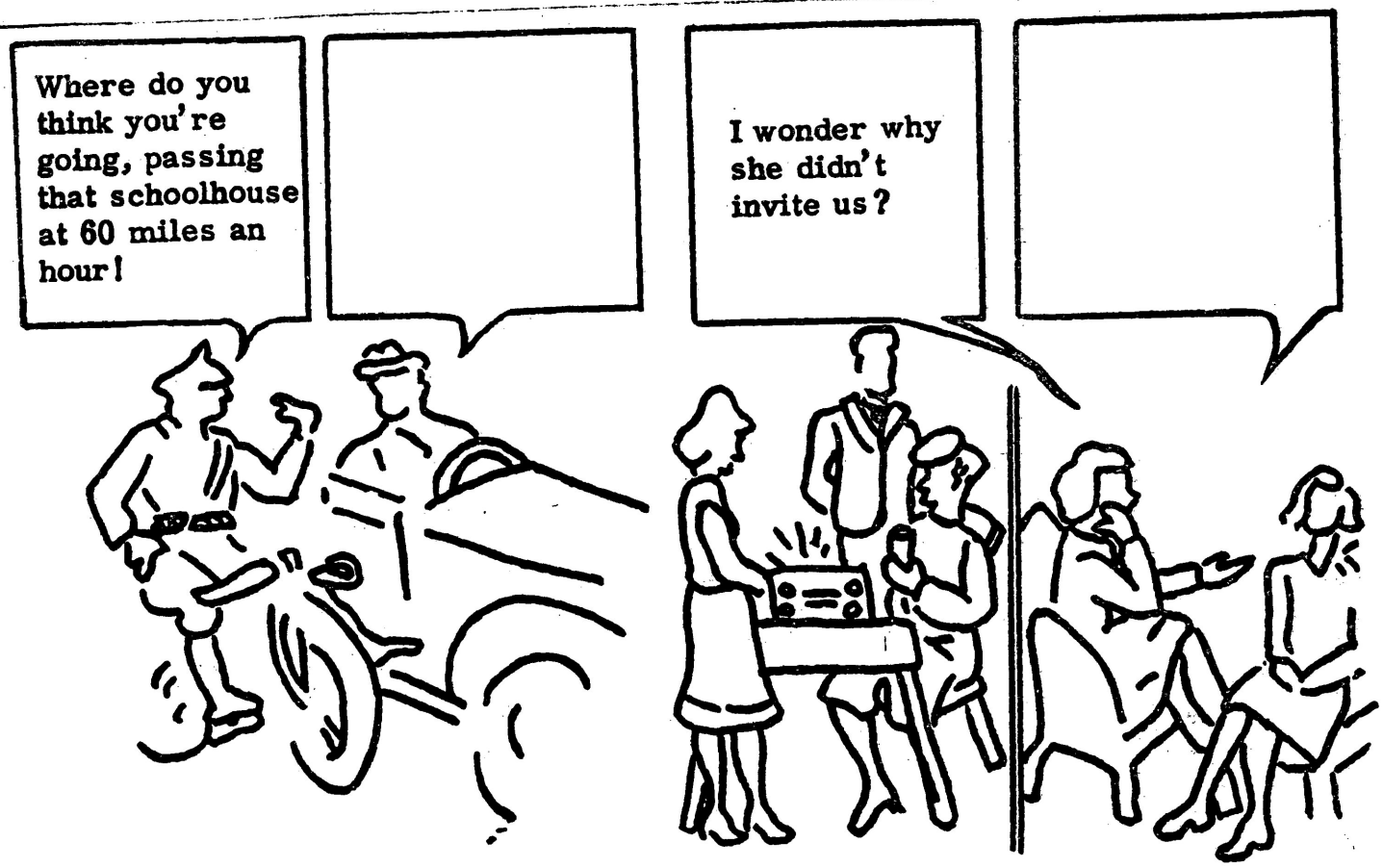
4.


Pardon me--
the operator
gave me the
wrong number.
If this isn't your
hat, Fred Brown
must have walked
off with it by
mistake and left
his.

5.

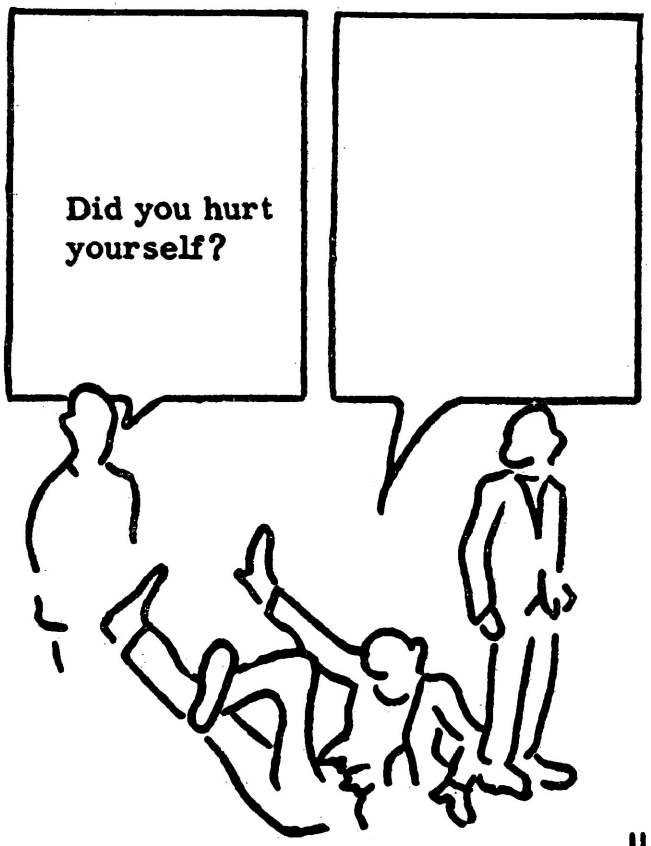
6.


I can't see you this morning even though we made the arrangement yesterday.
7.
You had no right to try and pass me.
8.


Where do you think you're going, passing that schoolhouse at 60 miles an hour!
I wonder why she didn't invite us?

9.

10.



11.

Appendix D

RIDDLES TEST

Instructions: Please answer the following riddles to the best of your ability. You are allowed 20 minutes to complete this task. Try not to leave any questions unanswered.

RIDDLES

1. What kind of paper makes the best kite?

2. Why didn't you put an ad in the paper for your lost dog?

3. What would you call a chicken dance?

4. What is it that dogs have and nothing else has?

5. What happens when an owl has laryngitis?

6. What does a cowboy call a hypodermic needle?

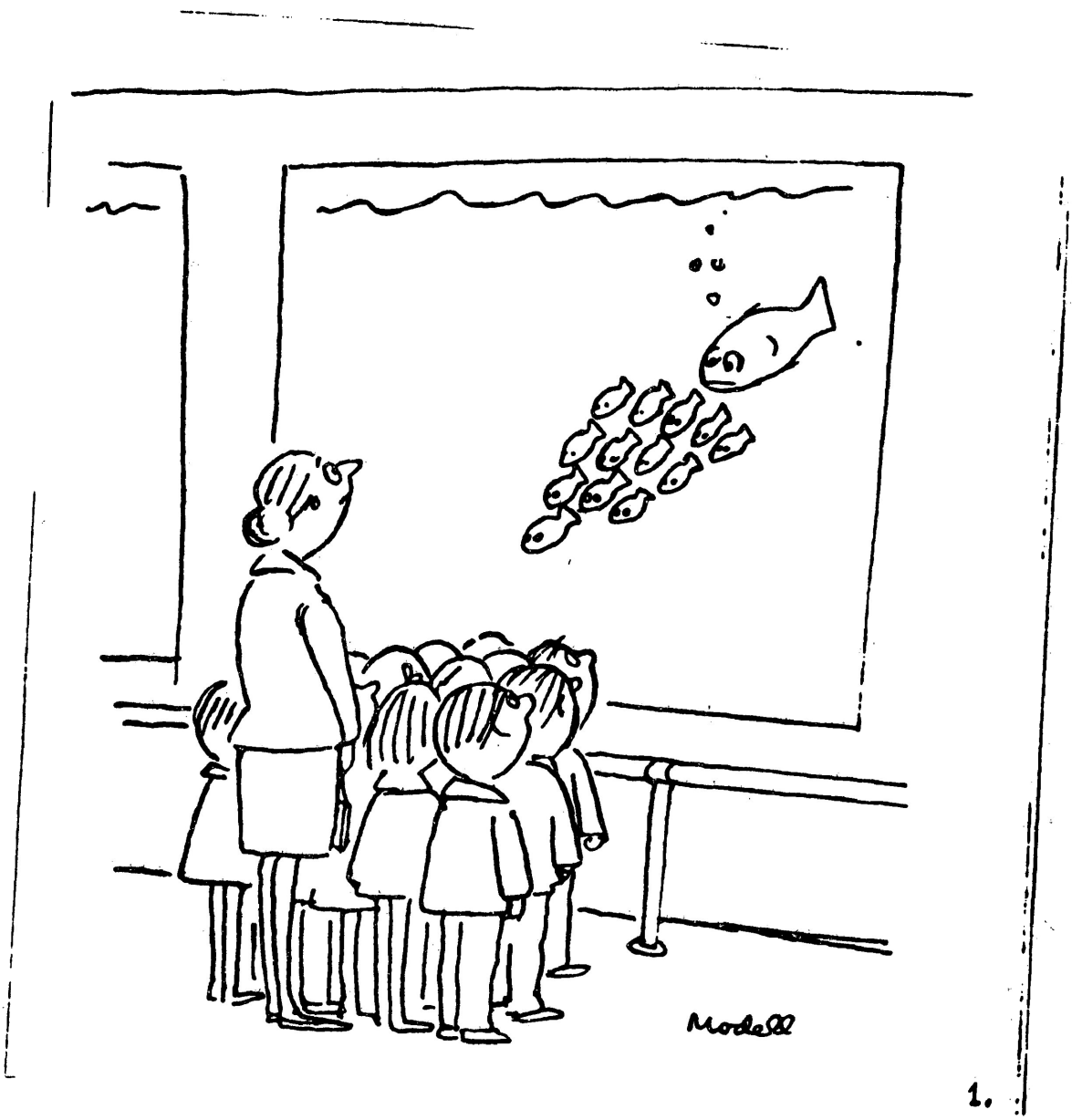
7. What is the only kind of coat that fits perfectly?

Appendix E

C.C.T.

INSTRUCTIONS

On each of the following pages you will find a cartoon. You are asked to examine the cartoon and explain what is funny about it. Write your explanation immediately below each cartoon. You will be allowed 7½ minutes to complete this task. Try not to leave any questions unanswered. Do not spend too much time on any one cartoon.



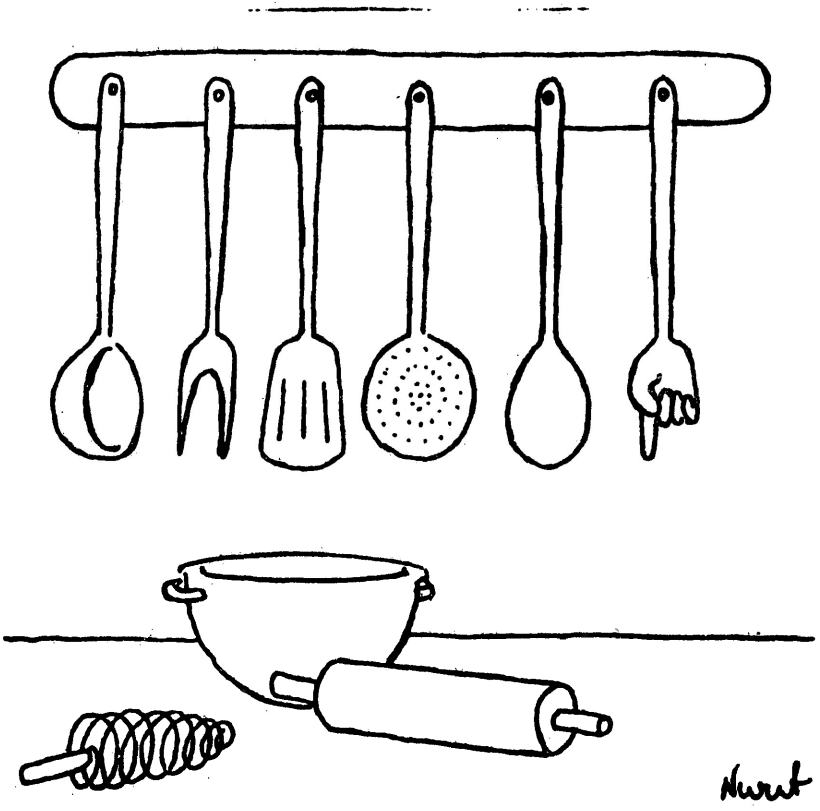
1.

"Can I get you anything? I'm going into town."

2.


LAW OF DIMINISHING RETURNS
LAW OF THE JUNGLE
LAW OF AVERAGES
UNWRITTEN LAWS

3.



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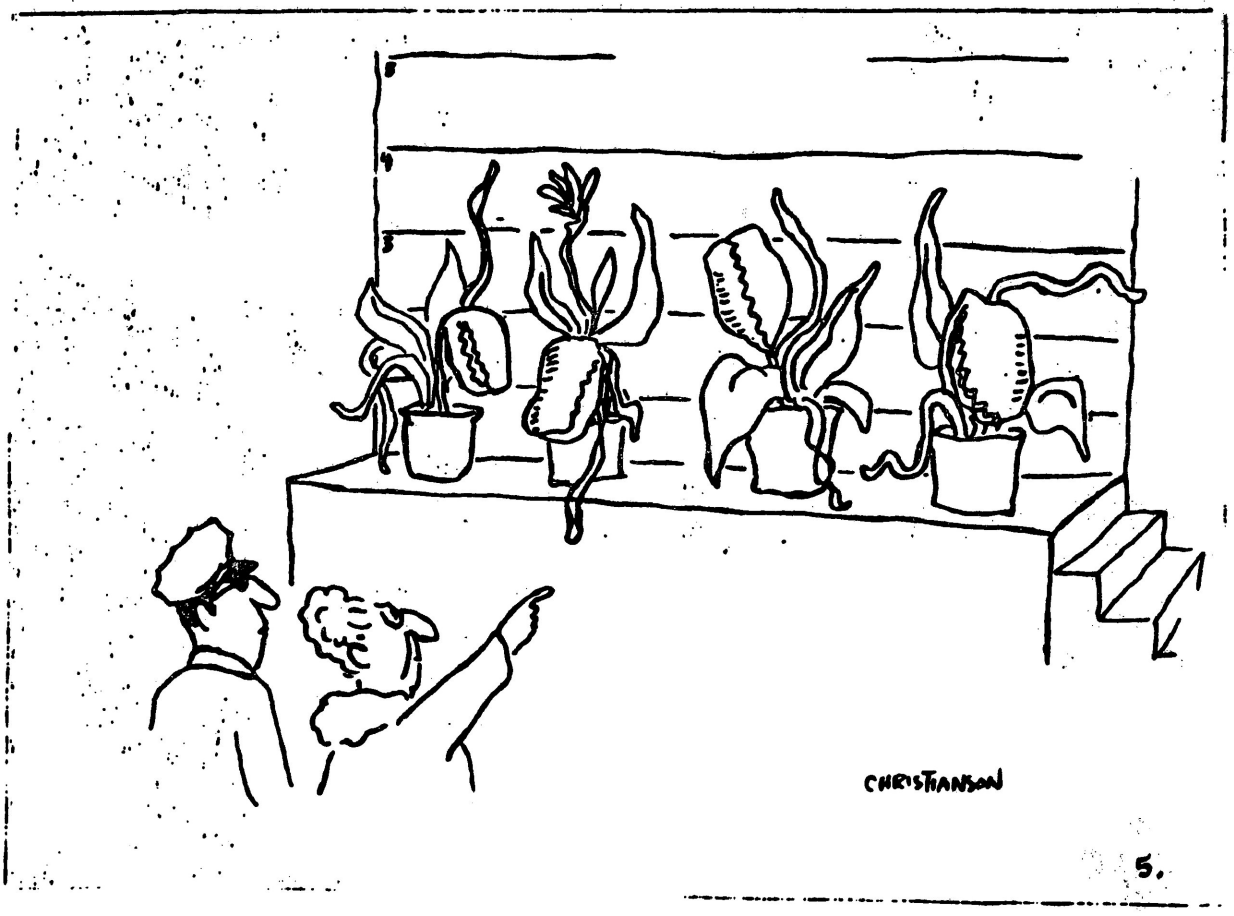
CHRISTIANSON
5.

Appendix F

JOKE ENDINGS TEST

This is a test which measures your sense of humour. There are 12 jokes on the pages which follow. Each joke is unfinished and has four possible endings from which you will select the most humourous. You are to read over the first part of the joke and then decide which ending would make the <u>whole</u> joke the funniest. When you decide, you are to draw a single line <u>through</u> the number corresponding to the ending of your choice for that particular joke. Here is an example:

73. Ernie -- My grandfather can play the piano by ear.

Gurney -- That's nothing --

(1) So can my brother

(2) My Grandfather fiddles with his whiskers.

(3) Lots of people can

(4) I used to be able to do the same thing.

The right answer to the example is (2), "My Grandfather fiddles with his whiskers," so you would make a single line through the choice numbered "2" for joke 73, like this -- 73. 1 2 3 4

If you should make a mistake and want to change your answer, make a second line crossing through the number and then mark your new choice with the single line, like this -- 73. 1 2 3 ~~4~~-

You will find that making the selection of ending for some of the jokes that follow will be more difficult than in the example just given, but for each joke select one ending. Some of the jokes and endings may be familiar to you; you may think that some of the jokes would not be funny with any of the endings provided, but always choose the ending that you think has the best chance of being the funniest.

Make a choice for every joke.

You are allowed 10 minutes to complete this task.

1. Father (reproving his son and heir for greediness): "Jimmie, you're a pig. Do you know what a pig is?"
   Jimmie:
   (1) "Yes, Papa. It's ham, bacon and pork chops walking around on its knuckles."
   (2) "No, Papa. But maybe you could show me."
   (3) "Yes, Papa. A pig is a hog's little boy."
   (4) "Sure. It's nothing but fat with a flat nose at one end and a curley tail at the other."

2. Mother: "Come, Lonnie, don't be a little savage; kiss the lady."
   Lonnie: "No, she's a naughty lady. --
   (1) If you want to kiss her, go ahead, I'd rather be a savage."
   (2) She already kissed Papa."
   (3) Besides, kissing brings out the beast in us savages."
   (4) If I kiss her, she may give me a slap just as she did Papa."

3. The Metropolitan Symphony Orchestra had played in a small New England town, the first experience of the kind for many of the inhabitants. Next day some of the old timers gathered 'round the stove in the General Store and expressed their opinions. The comment of one of the oldest inhabitants was: "All I got to say is,

   (1) it was a danged long way to bring that big bass drum only to bang it wunst."

   (2) I'd like to see the eyes of them fiddlers if they could watch Jeb Blazbow play standing on his head."

   (3) I don't see how them guys can play and read at the same time."

   (4) if you want to hear real music you ought to hear Zeke Pritchit's three-toned milk bucket."

4. There was a young person called Smarty,
   Who sent out his cards for a party;
   So exclusive and few
   Were the friends that he knew

   (1) That no one was present but Smarty.

(2) That they danced, drank, and laughed loud and hearty.

(3) That the party went on a Safari

(4) There was Arty, and Marty, and Smarty.

5. Little Tommy -- "Sister May must be able to see in the dark."

His Mother -- "Why do you think so?"

Tommy -- "Because last night when she was sitting with Mr. Steady in the living room

(1) I heard her say, 'Why Rufus, you haven't shaved.' "

(2) she turned out the light and said, 'Let's play post office.' "

(3) I heard him say, 'The light of your eyes is as bright as the upper beam on a Greyhound bus.' "

(4) I asked her what they were doing and she said that I should leave them alone, that they were reading the paper."

6. "I hear you have a little sister."

"Yes," answered the small boy.

"Do you like her?"

"I wish it was a boy, 'cause then I could play marbles, baseball and other games with her."

"Then why don't you exchange her for a brother?"

"Can't," was the answer, --

(1) "It's against the rules."

(2) "It's too late now. We've used her four days."

(3) "If we got a brother, he might not like baseball anyway."

(4) "They were all out of little boys."

7. "Mamma," asked little Mary, "If I get married, will I have a husband like Daddy?"

"Yes, dear."

"And if I don't get married, will I be an old maid, like Aunt Agatha?"

"Yes, dear."

(1) "I think I'd rather be an old maid."

(2) "I'd rather have a husband like Aunt Agatha."

(3) "If you were me, which would you do?"

(4) "Mamma, it sure is a hard world for us women, isn't it?"

8. Several little boys conversing:

First little boy: See this mark on my back, it's because my mother ate strawberries before I was born.

Second little boy: This mark on my hand is because my mother was frightened by a mouse.

Third little boy (in deep, slow voice): When I was born my mother cracked a phonograph record,

(1) and ever since then I've talked like this.

(2) and now people think I'm cracked.

(3) but I'm not superstitious--superstitious--superstitious

(4) and I have trouble turning around.

9. A father called his three children together, saying, "Children, I feel that you have reached an age when you should understand exactly the whole truth about your parents. I am very sorry to have to tell you that your mother and myself were never really married." Sarah, the 20-year-old daughter, fainted

dead away. Sammy, seventeen, kept silent.

Then Johnny, fourteen, remarked:

(1) "It doesn't make any difference to me if it doesn't make any difference to you'"

(2) "Well, I'll be a dirty bastard! "

(3) "What am I going to tell the boys down at the scout troop?"

(4) "Well, I don't know what the rest of you bastards are going to do, but I'm going to the movies! "

10. Lecturer: Of course, you all know what the inside of a corpuscle is like.

Chairman:

(1) Of course, it's like a boil -- only bigger.

(2) I'm sure we do, but would you like for me to send out for a couple.

(3) Most of us do, but you'd better explain it for the benefit of them as have never been inside one.

(4) I understand that it is very much like the outside -- only smaller.

11. A distinguished visitor to an insane asylum went to the telephone and found difficulty in getting his connection. Exasperated, he shouted to the operator:

"Look here, girl, do you know who I am?"

"No," was the reply, --

(1) "But then <u>you</u> don't know who I am either."

(2) "Not exactly."

(3) "Napoleon?"

(4) "But I know <u>where</u> you are."

12. Butch: That was a good picture of your pop that your ma showed me. But why did it only show his head?"

Scarface:

(1) The rest of the picture stuck to the post office wall.

(2) She wanted to cut off the number.

(3) That's cause she had the electric chair taken out.

(4) What did you expect -- movies?

Appendix G

PROVERB TEST

On the pages which follow you will find 12 groups of four statements each. Three of each group of four mean the same thing or have the same general meaning. Many of the statements are proverbs and, hence, may not be talking about the same thing but still have the same generalized meaning.

Your task is to pick out the one statement whose meaning is most unlike the other three. When you decide, you are to draw a single line through the number corresponding to the statement you think is different for that group -- like this:

73. 1 2 ~~3~~ 4

If you should make a mistake or want to change your mind, do not erase but simply draw a second line through the answer you want to change and then draw a single line through your new choice -- like this:

73. ~~1~~ 2 ~~3~~ 4

You are allowed 12 minutes to complete this task.

1. 1. A blind hen may find a seed
   2. A chain is only as strong as its weakest link
   3. From the mouths of babes, oft times come gems
   4. The youngest hound may trap the fox

2. 1. Learning makes a good man better and an ill man worse
   2. Learning is ever in the freshness of its youth, even for the old
   3. Better learn late than never
   4. We are never too old to learn

3. 1. When in Rome do as the Romans do
   2. The laws of custom have the largest court
   3. In a forest one must howl with the wolves
   4. No one is a stranger in his own village

4. 1. The bet isn't won 'til the wager is paid
   2. Don't count your chickens before they are hatched
   3. An ounce of prevention is worth a pound of cure
   4. Don't cross your bridges until you come to them.

5. 1. A small tree can cast a long shadow
   2. Well seasoned wood makes the truest flooring
   3. The swimmer escapes the flood
   4. The choppy sea makes the sailor

6. 1. The apple falls near its tree
   2. As the old cock crows the young ones learn
   3. The tallest tree will see the sun
   4. As the twig is bent, so's the tree inclined

7. 1. Don't take a bite out of your own arm
   2. If you eat a pudding at home the dog shall have the skin
   3. People who live in glass houses shouldn't throw stones
   4. Have a care lest you have to eat your own words.

8. 1. An honor won is surety for more
   2. Seek honor first and pleasure lies behind
   3. It is worthier to deserve honor than possess it.
   4. Honor deserves its reward

9. 1. He that wants hope is the poorest man alive
   2. He that lives upon hope will die fasting
   3. He that lives on hope danceth without a fiddle
   4. Hope is a good breakfast, but an ill supper

10. 1. As good as beat your heels against the ground
    2. Butting your horns against the vacant air
    3. Don't let your neighbor count your troubles
    4. Don't spur a willing horse

11. 1. Fools rush in where angels fear to tread
    2. Discretion is the better part of valor
    3. A fool and his money are soon parted
    4. Courage should have eyes as well as arms

12. 1. Wealth and content are not always bedfellows
    2. Silks and satins may put out the kitchen fire
    3. Wealth is not his that has it, but his that enjoys it
    4. Money is the root of all evil

Appendix H

Table 3

Pearson Correlations Among Humour Comprehension Humour Production and Proverb Test Results (N = 26)

		2	3	4	5	6	7
1	Provide-a-Caption Test	.4490**	.2882	.3132	.3298*	.4986**	.3281
2	Droodles Test		.2379	.1656	.4662**	.2178	.1527
3	Modified Rosenzweig			.2904	.3548*	.4549**	.3881*
4	Riddles Test				.1319	.1935	.3741*
5	Cartoon Comprehension Test					.2354	.0131
6	Joke Endings Test						.5146**
7	Proverbs						

*P < .05
**P < .01

Appendix I

INSTRUCTIONS TO JUDGES

Note: 1) Written instructions to judges were supplemented by verbal ones, until the experimenter was convinced of the judge's comprehension of his assigned task.

2) Since with the Riddles and Rosenzweig tests several test items are included on one page, the ranking of responses with these materials required the judges to record each subject's rank before proceeding with the ranking of the next test item. On those tests where this procedure was not necessary (as in the Droodles Test, the P. A. C. T., and the C. C. T.) the actual recording of each subject's assigned rank was carried out by the experimenter.

Instructions to Judges

Provide-a-Caption Test (P. A. C. T.)

Please rank the following individuals according to their ability to create a humourous caption for the cartoon. For each test item, arrange the pages so that the cartoon with the best caption is at the top of the pile and the poorest one is at the bottom of the pile. When two or more cartoons are tied for a certain rank, fasten the tied cartoons with a paper clip to indicate the tie, and proceed with the ranking.

Instructions to Judges

Droodles Test

Please rank the following individuals according to their ability to formulate a humourous description of the drawing provided. For each test item, arrange the pages such that the drawing with the most humourous description is at the top of the pile and the least humourous one is at the bottom of the pile. When two or more of the descriptions are tied for a certain rank, fasten the tied descriptions with a paper clip to indicate the tie, and proceed with the ranking.

Instructions to Judges

Rosenzweig Cartoons

Please rank the following individuals according to their ability to create humourous captions. For each test item, arrange the pages such that the cartoon with the most humourous caption is at the top of the pile and the least humourous one is at the bottom of the pile. When two or more of the cartoons are tied for a certain rank, fasten the tied captions with a paper clip to indicate the tie, and proceed with the ranking.

When you have completed the ranking of all captions for one cartoon, you are to write down each subject's rank under the appropriate 'rank' column on the sheet provided. Cartoons with the best captions are to receive the lowest rankings (e.g. 1,2,3 etc..) and the cartoons with the poorest ones are to receive the highest rankings (e.g. 13,14,15 etc..). If you have found two or more captions to be tied in rank, simply assign them the same rank. You may then proceed with your ranking of the next cartoon's captions.

Instructions to Judges

Riddles Test

Please rank the following individuals according to their ability to solve riddles. For each test item, arrange the pages such that the riddle with the most humourous answer is at the top of the pile and the least humourous one is at the bottom of the pile. When two or more of the riddle answers are tied for a certain rank, fasten the tied answers with a paper clip to indicate the tie, and proceed with the ranking.

When you have completed the ranking of all answers for one riddle, you are to write down each subject's rank under the appropriate 'rank' column on the sheet provided. Riddles with the most humourous answers are to receive the lowest rankings (e.g. 1,2, 3 etc..) and those riddles with the least humourous answers are to receive the highest rankings (e. g. 13, 14, 15 etc.). If you have found two or more answers to be tied in rank, simply assign them the same rank. You may then proceed with your ranking of the next riddle's answers.

Instructions to Judges

Cartoon Comprehension Test (C. C. T.)

Please rank the following individuals according to their degree of comprehension of the joke. You are to consider equally any explanation which 'fits' the joke in question. For each test item, arrange the pages so that the person who has best understood the cartoon is at the top of the pile and the one who has least understood the cartoon is at the bottom of the pile. When two or more cartoons are tied for a certain rank, fasten the tied cartoons with a paper clip to indicate the tie, and proceed with the ranking.

Appendix J

Table 4

Ranked Scores of Subjects on 7 Measures

Subject	1 P.A.C.T.	2 Droodles	3 Rosenzweig	4 Riddles	5 C.C.T.	6 J.E.T.	7 Proverbs
A	5.5	12	3	9	8	2	7.5
B	19	23	14	21	16	12.5	12
C	1	3	5	2	1	6	7.5
D	14	5	16	16.5	17	2	12
E	9	14	20	26	19	6	24
F	7	7	11	8	7	6	3
G	21	20	10	23	20	21	12
H	5.5	18.5	22	3	10.5	12.5	3
I	17.5	8	8	18.5	24	12.5	17
J	8	15.5	1	7	14	6	5.5
K	17.5	9.5	21	10	26	24.5	17
L	20	15.5	6	5	21.5	12.5	3
M	24	25	24	25	10.5	12.5	22
N	4	6	9	24	9	12.5	12
O	3	1	12.5	12.5	4	12.5	1
P	26	9.5	4	12.5	2	21	12
Q	2	2	2	16.5	3	12.5	19.5
R	15.5	17	18.5	18.5	15	17.5	22
S	13	4	18.5	15	21.5	21	22
T	12	18.5	15	1	23	2	12
U	22	21	17	6	5	21	19.5
V	23	24	23	20	25	26	25
W	11	26	7	11	13	6	5.5
X	10	22	26	14	18	17.5	12
Y	25	13	25	22	12	24.5	17
Z	15.5	11	12.5	4	6	21	26

Appendix K

Table 5

Absolute Scores of Subjects on the Proverbs Test and Joke Endings Test

Subject	Joke Endings Test	Proverbs Test
A	9	8
B	7	7
C	8	8
D	9	7
E	8	3
F	8	10
G	5	7
H	7	10
I	7	6
J	8	9
K	4	6
L	7	10
M	7	4
N	7	7
O	7	11
P	5	7
Q	7	5
R	6	4
S	5	4
T	9	7
U	5	5
V	1	?
W	8	9
X	6	7
Y	4	6
Z	5	1

Note. Both tests contained a total of 12 items.

Appendix L

Sample Test Responses of Subjects on the Provide-a-Caption Test, Droodles Test, Modified Rosenzweig, Riddles Test and Cartoon Comprehension Test

Test	Test Item No.	Page	Subject	Ranked Score of Subject	Response
P.A.C.T.	3	53	C		"No, I don't want to water the fire hydrants tonight"
			D	14	"If you can get your own leash, why don't you walk yourself"
			P	26	"Not now I'm readin the paper"
Droodles	5	61	O		"A rear view of 4 mice sitting on a tightrope"
			Y	13	"Four mice are digging their holes"
			W	26	"Prunetree Avenue"
Rosenzweig	6	65	J	1	"How do you mistake a bowler for a moth eaten cowboy hat?"
			B	14	"When I see Fred th hat won't be walkin off but flying off"
			X	26	"Are you sure it wa a mistake?"
Riddles	5	71	T	1	"Doesn't give a hoo
			X	14	"It would have to nest temporarily in a ruin near an ice cream shop"
			E	26	"Hoots instead"

Appendix L (Cont.)

C.C.T.	2	74	C	1	"They already live in town but due to all th plants on their balcon ,which is like a jungl , you wouldn't know it So ridiculous with all the plants"
			W	13	"Seems like a city jun gle"
			K	26	"What could there possibly be to get, he appears to have it all