APPLIED COGNITIVE PSYCHOLOGY, VOL. 6, 379–387 (1992)

Verbal Hallucinations in Normals, I: People who Hear 'Voices'

TERRY R. BARRETT and JANE B. ETHERIDGE
Psychology Department, Murray State University, Murray, KY 42071, U.S.A.

SUMMARY

Two studies are reported that describe the phenomena of verbal hallucinations in the general population and test two explanations of those reports. Subjects were 198 male and 387 female college students who completed a verbal hallucination questionnaire plus one or more additional questionnaires. We found that a large minority reported hallucinations and that nearly half reported having them at least once a month. The present data indicated that these reports were not related to four measures of social conformity. Neither were they related to measures of overt, or incipient, symptoms of psychopathology. We have concluded that the majority of these reports are generally veridical accounts of conscious experience in normal individuals.

Hallucinations, particularly verbal hallucinations, are generally associated with a variety of altered conditions of consciousness such as the beginnings and endings of sleep periods (McKellar, 1968), sensory deprivation (Zuckerman and Cohen, 1964), and a number of psychopathological states such as brief reactive psychosis, schizophreniform disorder, and schizophrenia (American Psychiatric Association, 1987). Over the past 100 years, however, there have been scattered reports of individuals in the general population who claim that they experience verbal hallucinations (e.g. Bentall and Slade, 1985; Posey and Losch, 1983; Sidgwick, 1894).

Motivated by a speculative theory of consciousness set forth by Jaynes (1976), Posey and Losch (1983) developed a questionnaire that consisted of the descriptions of 14 different verbal hallucinations, collected from individuals who claimed to have such experiences. Then they asked 375 college students to indicate whether they had ever had similar experiences. Overall, 71 per cent of the students reported having had at least one experience with a verbal hallucination.

These findings suggest that a relatively common phenomenon in normal consciousness may have been entirely overlooked in theories of cognition and consciousness. An alternative is that the reports of hallucinations do not reflect actual normal conscious experience. For example, it might be that these reports are largely due to reactivity in the experimental situation. In other words, it may be that subjects are simply reporting what they think the experimenter wants to hear. On the other hand, it might be that at least some of these reports do reflect hallucinatory experiences. However, these might not reflect processes associated with normal conscious-

0888–4080/92/050379–09$09.50

Received 29 Septemnber 1989
Revised 28 February 1991

ness. Instead they might reflect the presence of incipient psychopathology among individuals in the general population.

In the present paper we report the results of two studies. The first was designed to more fully describe the phenomenon of verbal hallucinations in the general population. In addition, we examined the possibility that individuals who report verbal hallucinations are not telling us the truth. In the second study we explored in detail the possibility that persons who report verbal hallucinations are exhibiting signs of psychopathology.

STUDY 1

In the present study we tested a total of 586 subjects using the basic verbal hallucination questionnaire described by Posey and Losch (1983). In addition, the final 345 subjects were asked to indicate, on a seven-point scale, the frequency of occurrence of each experience they reported. Of these 345 subjects the last 162 tested also completed four paper-and-pencil scales often used to measure social conformity, i.e. the extent to which people are likely to tailor their responses to what they believe are socially appropriate responses in a particular situation.

Method

Subjects

The subjects were 586 college students who received extra credit in a general psychology class for their participation. There were 198 males and 387 females. One person failed to indicate gender. These subjects had a mean age of 20.24 years.

Materials

Verbal hallucination questionnaire. The verbal hallucination questionnaire used was quite similar to the one developed by Posey and Losch (1983). It consisted of 13 descriptions of verbal hallucination experiences actually reported by individuals. Of these, 10 were identical to those used by Posey and Losch (1983). For all 586 subjects the verbal hallucination questionnaire asked subjects to indicate whether they had ever had an experience that was similar to the one described. If subjects answered in the affirmative they were asked to write a description of that experience. After we had tested 241 subjects we altered the verbal hallucination questionnaire somewhat. For each type of experience reported by the final 345 subjects they were asked to rate how often it occurred on a seven-point scale. The seven points on the scale were: 1 = 'just once or twice ever', 2 = 'once every couple of years', 3 = 'once a year', 4 = 'once every six months', 5 = 'once a month', 6 = 'at least once a week', and 7 = 'at least once a day'.

Social conformity scales. We used the K scale of the MMPI (Hathaway and McKinley, 1967); the Marlow–Crowne social desirability scale (Crowne and Marlow, 1960); the self-monitoring scale (Snyder and Gangestad, 1986); and the self-consciousness scale (Fenigstein, Scheier, and Buss, 1975). This final scale divides into a public self-consciousness subscale and a private self-consciousness subscale.

Table 1. Percentage interindividual frequency of occurrence and means and standard deviations for intraindividual frequency of occurrence ratings of verbal hallucinations

	Frequency of occurrence				
	Interindividual		Intraindividual		
Description	Present Study %	Posey and Losch %	%	*M*	(SD)
1. Own name in store	64.0	56.5	60.0	3.58	(1.78)
2. Own name from backyard	38.4	38.7	40.3	3.09	(1.87)
3. Own thoughts aloud	37.2	38.9	34.5	4.96	(1.72)
4. Own name in house alone	32.8	36.0	34.5	3.46	(1.57)
5. Own name falling asleep	24.6	29.6	28.1	3.44	(1.85)
6. Phrase when waking	15.0	14.1	16.8	4.05	(1.83)
7. Other sleep-related	26.3	—	23.2	3.45	(1.97)
8. Imaginary playmate	14.0	—	18.8	6.38	(1.10)
9. Phrase, rear of car	12.6	10.7	12.8	3.70	(1.66)
10. Hear absent friend	11.3	—	12.2	4.50	(1.55)
11. God's voice	8.7	11.5	7.2	3.32	(2.17)
12. Voice of dead relative	6.3	5.3	6.7	4.35	(2.37)
13. Conversation, rear of car	6.1	6.1	6.1	3.76	(1.70)

Procedure

Subjects were run in groups ranging from one to approximately 60 individuals. General instructions for the verbal hallucination questionnaire were provided as the cover sheet to the questionnaire. The experimenter stressed that subjects should only report experiences in which they heard a voice outside of their head when no-one actually said anything. All of the 586 subjects filled out at least one additional questionnaire besides the verbal hallucination questionnaire. However, in all cases the verbal hallucination questionnaire was given as the first questionnaire. For the final 345 subjects, after they had completed the verbal hallucination questionnaire, they filled out the self-consciousness scale. When that was finished they completed a long series of true–false questions that included all the items from the MMPI K Scale, the self-monitoring scale, and the Marlow–Crowne social desirability scale, randomly distributed among 168 distractor items to mask the purpose of the target items. Subjects were given as much time as necessary to complete all the forms.

Results and Discussion

Interindividual frequency of occurrence

The first columns in Table 1 show the percentage of total subjects responding in the affirmative to each description in the present study and in the Posey and Losch (1983) study. We have referred to these as interindividual frequency of occurrence measures.

Across all 10 of the descriptions that were the same in the two studies, the percentage difference was only −.2 per cent. A separate 2 × 2 chi-square was calculated for each of these descriptions. The independent variables were response (yes vs. no) and study (present study vs. Posey and Losch, 1983 study). The only significant chi-square was for description 1[$\chi^2(1) = 5.35, p < .05$]. No other chi-square approached

significance. These analyses indicate that the observed rates of verbal hallucinations in the present study closely paralleled the rates reported by Posey and Losch (1983).

Intraindividual frequency of occurrence

Column 3 of Table 1 shows the percentage of subjects (out of 345) responding in the affirmative to each item. Columns 4 and 5 show the means and standard deviations of the frequency of occurrence ratings on the seven-point scale for each of the 13 descriptions for those subjects. We have referred to these ratings as the intraindividual frequency of occurrence ratings.

Across all 13 questions the mean frequency of occurrence rating was 3.89. On average, individuals who reported a verbal hallucination also reported that it occurred about twice a year. Collapsed across all descriptions there was a relatively large minority of persons who reported that an event only occurred once or twice ever (23 per cent) while 45 per cent reported that the event occurred between once a day and once a month.

For the purposes of analysing the social conformity data, we defined two verbal hallucination scales. One measure we called the total verbal hallucination scale. It contained all 13 descriptions and was scored by adding the intraindividual frequency of occurrence ratings together for all 13 descriptions. The second scale we called the major verbal hallucination scale. For this scale we used the seven descriptions (items 2, 3, 4, 9, 10, 12, and 13 on Table 1) that seemed most likely to us to elicit reports of actual verbal hallucinations in a normal state of consciousness. We excluded all of the sleep-related descriptions and hearing one man's name in a store. We also excluded hearing God's voice since several of our subjects seemed to have trouble discriminating between actually hearing a voice they took to be God's voice and 'knowing' that God was telling them something without actually hearing a voice outside of their head. We also excluded description 8 which deals with an imaginary playmate, since these experiences are not presently taking place in any of our adults. To calculate a score on this scale we added the intraindividual frequency of occurrence ratings for each of these seven descriptions.

Social Conformity

All of the social desirability scales were scored so that a larger score reflected more of the attribute being measured. Since the analyses using the total verbal hallucination scale and the major verbal hallucination scale yielded similar results, only the analyses using the total verbal hallucination scale will be reported. Correlations between the social conformity measures and the total verbal hallucination scale yielded two of a possible six significant correlations. The total verbal hallucination scale was significantly related to both the raw ($r = -.33$) and T score ($r = -.33$) measures from the MMPI K scale. Individuals with more reported verbal hallucinations tended to have lower scores on the K scale. This is, of course, the opposite of what we predicted might happen. None of the other correlations even approached significance.

In order to further test for the hypothesized relationships, we defined a pool of hallucinators (subjects in the top 25 per cent) and a pool of non-hallucinators (subjects in the bottom 25 per cent), based on their total verbal hallucination scale scores. This breakdown yielded 40 hallucinators and 40 non-hallucinators. Then we conducted a series of two-group analyses of variance on the social conformity measures. The results of these analyses were consistent with the correlations. The two groups

were reliably different on both the raw score (hallucinators = 9.95, non-hallucinators = 13.53) and *T* score (hallucinators = 45.83, non-hallucinators = 52.33) measure from the MMPI K scale [$F(1,78) = 17.65$, $p < .0001$ and $F(1,78) = 16.30$, $p < .0001$, respectively]. Hallucinators had lower scores on the MMPI K scale than did non-hallucinators.

All of these data indicate that there is no clear relationship between social conformity and the reported occurrence of verbal hallucinations. These results are in agreement with those reported by Young, Bentall, Slade, and Dewey (1987), who found that normals and psychiatric patients scoring high on the Launay–Slade hallucination scale (Launay and Slade, 1981) did not differ from non-hallucinators in this respect. The only consistent finding was that individuals who reported more verbal hallucinations had lower scores on the K scale of the MMPI. One way to interpret this finding is to suggest that these individuals are actually failing to report some verbal hallucination experiences because they believe these experiences will be viewed as psychopathological in nature. To the extent that this is happening, it suggests the reports of verbal hallucinations might actually be an underestimate of the actual frequency of occurrence of verbal hallucinations.

According to Graham (1987), however, *T* scores of between 55 and 70 should be considered average for college students. Individuals who have low scores on the K scale may be faking bad or exaggerating problems in order to receive help. He also suggests that low scores suggest the possibility of overt psychopathology. Since the hallucinators had a mean below 55, it may be that hallucinations in the general population reflect the presence of psychopathological problems. This possibility was explored in Study 2.

STUDY 2

In this study we attempted to determine if the reported presence of verbal hallucinations was related to tendencies towards psychopathology. Although hallucinations are not a necessary condition for the diagnosis of psychopathology in general, or schizophrenia in particular (American Psychiatric Association, 1987), reports of ongoing verbal hallucinations by an individual in situations not related to drug use, sensory deprivation, or sleep, are often taken as presumptive evidence for the presence of schizophrenia (Kaplan and Sadock, 1985; Sarbin, 1970). In fact the DSM III-R (American Psychiatric Association, 1987) explicitly recognizes frequency of verbal hallucinations as a major indicator of schizophrenia.

The evidence regarding the relationship of reported occurrences of verbal hallucinations and psychopathology in the general population is almost nonexistent. The exception is the study by Posey and Losch (1983). In their investigation, 20 individuals who reported a variety of verbal hallucinations were asked to complete the MMPI. An examination of these profiles suggested to Posey and Losch (1983) that the report of verbal hallucinations in the general population was probably not related to psychopathology. However, without an appropriate comparison group this conclusion may not be warranted. In fact, in Study 1 of the present investigation, hallucinators had a mean *T* score on the MMPI K scale significantly lower than non-hallucinators and almost a full standard deviation below the lower end of the normal range cited by Graham (1987) for college students, indicating the possibility of psychopathology.

Consistent with this hypothesis, Junginger and Frame (1985) suggested that verbal hallucinations, in the absence of other defining criteria of psychopathology, are generally predictive of future psychosis.

Method

Subjects

The subjects for this study were drawn from a pool of 183 of the last 345 subjects tested in Study 1. This pool excluded the 162 subjects tested on the social conformity scales. Consequently none of the subjects tested in this study had previously been exposed to any MMPI scale. Hallucinators were defined as individuals in the top 25 per cent of the distribution using the major verbal hallucination scale as our index of hallucinations. Non-hallucinators were defined as individuals in the bottom 25 per cent of the same distribution. From this pool we randomly selected and tested 24 hallucinators and 24 non-hallucinators.

Hallucinators had means and standard deviations (in parentheses) on the total hallucination scale and the major hallucination scale of 23.76 (8.68) and 12.79 (3.97), respectively. Non-hallucinators had means and standard deviations of 3.25 (3.43) and .17 (.38), respectively. The two groups did not differ significantly in proportion of females to males (hallucinators: 16 females and 8 males; non-hallucinators: 18 females and 6 males), on mean ACT composite scores (hallucinators = 22.17 and non-hallucinators = 20.40), or in mean age (hallucinators = 19.92 years and non-hallucinators = 20.42 years).

Materials

Subjects were given a computerized version of the 566 items (including repeats) on the MMPI (Hathaway and McKinley, 1967). A paper-and-pencil version of the SCL-90-R (Derogatis, 1983) was also used to uncover behaviours suggesting incipient psychopathology in otherwise normal individuals.

Procedures

Subjects were individually tested. The person was given instructions concerning the computerized MMPI and allowed as much time as necessary to complete the questionnaire. After that, the person was given standard instructions regarding the SCL-90-R and again given as much time as necessary to complete the questionnaire.

Results and Discussion

The MMPI was scored for three validity scales (L, F, and K) and for the 10 standard clinical scales (Graham, 1987). The SCL-90-R was scored for the three global scales and for the nine symptom scales (Derogatis, 1983). Both raw scores and K-corrected *T* scores were calculated on the MMPI and both raw scores and *T* scores were calculated on the SCL-90-R. Using criteria suggested by Graham (1987), we defined three data sets. One contained all the subjects; one contained all but three subjects (one hallucinator and two non-hallucinators) who had indications on the MMPI of an invalid profile; and one set that contained all but seven subjects (four hallucinators and three non-hallucinators) with a *T* score on at least one of the three MMPI validity scales of greater than 70. All of the individuals eliminated in set two were

also eliminated in set three. In all cases the results of the analyses were the same. In addition, both raw score and *T* score analyses on both the MMPI and on the SCL-90-R yielded similar results. Therefore, only the analyses of *T* scores using all of the subjects will be reported.

Two multivariate analyses of variance were calculated. For one of the analyses the dependent variables were the *T* scores on the 13 MMPI scales. For the other analysis the dependent variables were the *T* scores on the 12 SCL-90-R scales. For both analyses the independent variable was groups (hallucinators vs. non-hallucinators). In each of these analyses the multivariate F was < 1. The univariate analyses of variance indicated that the two groups did not reliably differ on any of the MMPI scales or on any of the SCL-90-R scales except on the SCL-90-R Depression scale [$F(1,46) = 4.95$, $p < .03$]. On this scale, hallucinators had a higher mean depression *T* score (65.34) than did non-hallucinators (59.04). This effect should be viewed with considerable caution, however, since the effect was not significant in the raw score analysis or in either the raw score or *T* analyses when potentially invalid profiles were eliminated. In addition, no analysis of the depression scale on the MMPI produced a reliable difference.

Graham (1987) indicated that *T* scores above 70 on the clinical scales of the MMPI have often been taken to represent elevated, or clinically relevant, values. For each of the clinical scales on the MMPI we calculated a chi-square using groups (hallucinators vs. non-hallucinators) and value (persons with *T* scores of 70 or below vs persons with *T* scores of above 70) as the two independent variables. In not one case did the chi-square even approach significance. Across the 10 clinical scales the mean number of hallucinators who had a scale score above 70 was 4.50, 18.75 per cent of the 24 hallucinators. The mean number of non-hallucinators who had such a score was 3.60, 15 per cent of the 24 non-hallucinators.

It seems clear from these results that the reports of verbal hallucinations in the general population cannot reasonably be explained as the result of psychopathology. These findings suggest that the results obtained on the MMPI K scale in Study 1 were most likely due to chance. Overall, we now believe that neither lying nor psychopathology can account for the reports of verbal hallucinations in the general population.

SUMMARY AND CONCLUSIONS

We found that the number of individuals in the general population reporting verbal hallucinations was quite high. There were several descriptions for which between 30 and 40 per cent of our sample indicated having had the experience. We also found that the rate of these reports across individuals was almost exactly the same as reported by Posey and Losch (1983). Almost half of the individuals who reported a verbal hallucination, indicated that the experience occurred at least once a month. We tested two hypotheses regarding the causes of these reports. One was that the reports were due to social conformity. The other was that the reports were related to incipient psychopathology. These were both rejected since reports of verbal hallucinations were not related to measures of social conformity or to measures of overt, or incipient, psychopathology.

The data we have presented, along with the results reported by Posey and Losch

(1983), suggest that these reports of verbal hallucinations represent reports of actual conscious experience. We believe that a relatively large minority of individuals in the general population do, in fact, experience frequent verbal hallucinations. It also seems reasonable to believe that these hallucinations do not a morbid origin. Generally, our conclusions regarding the relationship of verbal hallucinations and psychopathology are consistent with the growing conviction that all hallucinations are most profitably viewed as lying on a continuum of perceptual-like experience and are not, in and of themselves, indicative of a mental disorder (e.g. Asaad and Shapiro, 1986; Bentall, 1990; Strauss, 1969). However, it will be important to directly compare characteristics of hallucinations reported by schizophrenics with the hallucinations reported by individuals in the general population to test this hypothesis further.

There remains a great deal more to be learned about hallucinations, especially concerning the mechanisms responsible. Perhaps the most promising beginning in this direction has been made by Bentall and Slade (1988) and Bentall (1990). They have concluded that hallucinations in normals and in psychiatric patients have a common source. Their hypothesis is that hallucinations represent a failure in what they call a reality discrimination process. The idea is that there is an automatic monitoring process that continually monitors the contents of consciousness. The output of that process is used to make attributions concerning the source of the conscious experience. Hallucinations represent a failure in this normal monitoring process whereby an internally generated experience is misclassified as an externally generated event.

As Bentall (1990) has pointed out, this reality discrimination process is analogous to what Johnson and Raye (1981) have called a reality monitoring process. Reality monitoring refers to the ability of individuals to decide, based on the contents of a memory, whether that memory is of an actual event or of an internally generated experience. To the extent that reality discrimination processes and reality monitoring processes are similar there are several interesting, and experimentally testable, hypotheses regarding cognitive differences between those who experience verbal hallucinations and those who do not have such experiences. And as Hoffman (1986) has already recognized, the ready availability of individuals in the general population who experience frequent verbal hallucinations makes them an ideal group for testing these hypotheses.

ACKNOWLEDGEMENTS

The authors would like to thank several reviewers for their helpful suggestions on earlier drafts of this manuscript; they are Bruce Ekstrand, Ulric Neisser, and three anonymous reviewers. The research reported here was supported by Grant 2–12869 for 1987–88 from the Committee on Institutional Studies and Research at Murray State University. Requests for reprints should be directed to the first author at the Department of Psychology, Murray State University, Murray, KY 42071, U.S.A.

REFERENCES

American Psychiatric Association (1987). *Diagnostic and statistical manual of mental disorders*, 3rd edn, revised. Washington, DC: APA.

Asaad, G. and Shapiro B. (1986). Hallucinations: theoretical and clinical overview. *American Journal of Psychiatry*, **143**, 1088–1097.
Bentall, R. P. (1990). The illusion of reality: a review and integration of psychological research on hallucinations. *Psychological Bulletin*, **107**, 82–95.
Bentall, R. P. and Slade, P. D. (1985). Reliability of a scale measuring disposition towards hallucinations: a brief report. *Personality and Individual Differences*, **6**, 527–529.
Crowne, D. P. and Marlow, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting and Clinical Psychology*, **4**, 349–354.
Derogatis, L. R. (1983). *SCL-90-R: Administration, scoring and procedures manual.* Towson, MD: Clinical Psychometric Research.
Fenigstein, A., Scheier, M. F. and Buss, A. H. (1975). Public and private self-consciousness: assessment and theory. *Journal of Consulting and Clinical Psychology*, **43**, 522–527.
Graham, J. R. (1987). *The MMPI: A practical guide*, 2nd edn. New York: Oxford University Press.
Hathaway, S. R. and McKinley, J. C. (1967). *Minnesota Multiphasic Personality Inventory: Manual*, revised 1967. New York: Psychological Corp.
Hoffman, R. E. (1986). Verbal hallucinations and language production processes in schizophrenia. *Behavioral and Brain Sciences*, **9**, 503–548.
Jaynes, J. (1976). *The origins of consciousness in the breakdown of the bicameral mind.* Boston: Houghton Mifflin.
Johnson, M. K. and Raye, C. L. (1981). Reality monitoring. *Psychological Review*, **88**, 67–85.
Junginger, J. and Frame, C. L. (1985). Self-report of the frequency and phenomenology of verbal hallucinations. *Journal of Nervous and Mental Disease*, **173**, 149–155.
Kaplan, H. I. and Sadock, B. J. (1985). *Modern synopsis of the comprehensive textbook of psychiatry/IV.* Baltimore: Williams & Wilkins.
Launay, G. and Slade, P. (1981). The measurement of hallucinatory predisposition in male and female prisoners. *Personality and Individual Differences*, **2**, 221–234.
McKellar, P. (1968). *Experience and behavior.* Baltimore: Penguin Books.
Posey, T. B. and Losch, M. E. (1983). Auditory hallucinations of hearing voices in 375 normal subjects. *Imagination, Cognition and Personality*, **3**, 99–113.
Sarbin, T. R. (1970). The concept of hallucination. *Journal of Personality*, **35**, 359–380.
Sidgwick, H. (1894). Report of the census of hallucinations. *Proceedings of the Society for Psychical Research*, **10**, 25–422.
Slade, P. D. and Bentall, R. P. *Sensory deception: A scientific analysis of hallucination.* Baltimore MD: Johns Hopkins University Press.
Snyder, M. and Gangestad, S. (1986). On the nature of self-monitoring: matters of assessment, matters of validity. *Journal of Personality and Social Psychology*, **51**, 125–139.
Strauss, J. S. (1969). Hallucinations and delusions as points on continua function. *Archives of General Psychiatry*, **21**, 581–586.
Young, H. F., Bentall, R. P., Slade, P. D. and Dewey, M. E. (1987). The role of brief instructions and suggestibility in the elicitation of auditory and visual hallucinations in normal and psychiatric subjects. *Journal of Nervous and Mental Disease*, **175**, 41–48.
Zuckerman, M. and Cohen, N. (1964). Sources of reports of visual and auditory sensations in perceptual-isolation experiments. *Psychological Bulletin*, **62**, 1–20.