A DESCRIPTIVE STUDY OF THE RELATIONSHIP BETWEEN THE DEMANDS OF A SPECIFIC CHARACTERIZATION AND FUNCTIONAL VOICE PROBLEMS IN THE MALE ACTOR

Thesis for the Degree of Ph. D.
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BONNIE NANETTE RAPHAEL
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ABSTRACT

A DESCRIPTIVE STUDY OF THE RELATIONSHIP BETWEEN THE DEMANDS OF A SPECIFIC CHARACTERIZATION AND FUNCTIONAL VOICE PROBLEMS IN THE MALE ACTOR

By

Bonnie Nanette Raphael

An investigation was conducted in order to determine the effects of voice alterations used by the male actor in characterization on the physical condition of his throat and larynx and on his vocal characteristics. Eight actors cast in a Michigan State University production of Marat/Sade were used as subjects for the investigation. Each actor was tested by the researcher and examined by a consulting otolaryngologist during the first week of rehearsal, during the week of production, and two weeks after the show closed.

Data were collected at each interview and subsequently analyzed to determine breathing efficiency during reading, use of hard glottal attack, habitual reading rate, location of major breathing activity, habitual pitch for reading and conversational speech, pitch range, maximum duration of phonation, and voice quality. Readings from the playscript were analyzed to determine location of major breathing activity, breathing efficiency, use of hard glottal attack, rate, pitch, and voice quality for characterization. History was provided by each subject regarding

medical, educational, and vocational background. Finally, a log was kept by the investigator, recording all correspondence between director and actor regarding use of voice for characterization and voice problems encountered during rehearsals.

The study revealed that it is possible to determine both quantitatively and qualitatively in what respects and to what extent the actor alters his vocal characteristics for purposes of characterization. All actors participating in the study altered their vocal patterns in one or more of the following ways: change in habitual pitch, rate, and loudness; change in voice quality; and change in location of major breathing activity. The effects which such induced voice alterations had on the characteristics of the actors' own voices varied from one individual to another, and seemed to be related to medical history, condition of the throat and larynx at the initial examination, size of role portrayed and type of voice usage employed by the actor in the production, and perhaps the extent and type of voice and music training which the actor had undergone.

On a more specific level, this study revealed that there may be a relationship between an actor's tendency to breathe clavicularly when in character and the incidence of various symptoms of functional voice problems. The actor's use of habitual pitch for characterization close to or the same as optimum pitch did not seem to prevent the occurrence of functional voice problems, nor did the use of a significantly different pitch assure that occurrence. Furthermore, type and extent of quality

alteration induced by the actor did not seem to have a direct relationship to the type and extent of functional voice problems he encountered.

The study further demonstrated that in general, the greater the demands of a particular characterization on the voice of an actor who is inadequately trained vocally, the greater will be the likelihood of functional voice problems. However, the manner in which the actor employed his voice for characterization, in addition to the actual amount of use, was an important factor in his acquisition or avoidance of functional voice problems.

The study described a number of occurrences which may be regarded as symptomatic of the beginnings or presence of a functional voice disorder in the male actor, and others which may not be regarded as such. By surveying existing literature in voice pathology, laryngeal medicine, music, psychology, and theatre, by carefully describing and evaluating methodology employed, and by suggesting ways in which the study could be effectively repeated or expanded into different areas, the researcher has attempted to lay a possible foundation for future research into the vocal techniques and voice problems of the actor.

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By

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CHAPTER I

INTRODUCTION

Statement of the Problem

The voice of the contemporary American actor is one of the most vital tools of his art. Yet, until recently, the training of that voice has received comparatively little attention in most curricula, whether they are designed for the working actor or for the theatre major at American liberal arts institutions. The reasons for this lie within the very fabric of the American theatre.

Constant need for and relentless emphasis on commercial success have led to a preference by Broadway producers for popular fare. Because of the lack of a significant body of classical American dramatic literature, popular fare has meant contemporary domestic drama (e.g. Williams, Albee), situation comedy (e.g. Neil Simon), and musical comedy in the tradition of Rogers and Hammerstein. The bulk of American drama falling under the classification of popular fare is basically realistic in style and content and, to a greater or lesser degree, psychological in orientation. Hence, the professional training of actors for the drama has been heavily realistic and psychological in its emphasis. Training may be quite intensive in terms of motivation, inner truth, and believability; but the means by which these are externalized--namely, voice

and stage movement--have been relegated a secondary position, if any position at all. The actor may be trained to sing or dance, but his speaking voice has been more or less taken for granted or ignored, if not actually cultivated for its idiosyncrasies.

A perusal of the individual institutions' course offerings listed in the Directory of American College Theatre[1] corroborates these emphases in training. A student enrolled in any one of the majority of colleges and universities represented in the directory usually participates in an acting curriculum which emphasizes creativity, improvisation, intensive scene study, and some work in acting styles; voice training is seldom if ever a significant ingredient in such a curriculum. With the growing popularity of the B.F.A. program in theatre, skills may get the attention they deserve. However, an institution's offering of a B.F.A. degree in theatre is no guarantee of the inclusion of voice and movement training for actors in its course offerings. Furthermore, curricula leading to the bachelor of fine arts degree in theatre are still too few and far between, and in an early stage of development as well. For example, according to the Directory of American College Theatre, out of 1581 junior and senior colleges surveyed in 1967, only forty-three offered the B.F.A. in theatre; only thirty-three schools had curricula which were classified by the A.E.T.A. College Curriculum Project as pre-professional in their orientation.[2] Surely these numbers have risen by now, but the

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[1]Richard G. Ayers (ed.), Directory of American College Theatre (2nd ed. rev.; Dallas: American Educational Theatre Association, Inc., 1967).

[2]Ibid.

fact remains that the vast majority of United States colleges having theatre departments are liberal arts or content-oriented rather than basically concerned with preparing individuals to become members of the acting profession.

Another factor determining the nature of actor training in the United States has been the variety of media in which the actor works after the completion of such training. For the contemporary American actor, the "legitimate stage" (Broadway, regional repertory companies, etc.) is by no means as accessible or as financially lucrative as work in either films or television. The voice of an actor working in these latter media can be and most often is amplified, reverberated, or otherwise mechanically altered to his advantage. So, most American actors are found performing quite adequately in media which make far less strenuous demands on their voices than working in a proscenium theatre, a thrust stage, or an arena theatre does.

For these reasons, and some related others, the vast majority of American actors and acting teachers seldom seem to concern themselves directly with the voice--unless something goes noticeably wrong, or until a particular voice proves to be seriously inadequate in a particular situation. The actor may become aware of insufficient breath control, a lack of vocal variety, or a habitual rate which is far too ingrained to respond to the needs of a particular role; or he may be less fortunate and face the more serious problems of recurrent hoarseness, chronic laryngitis, or even vocal nodules.

This latter group of problems may fall into the category of functional voice disorders, that is, voice problems resulting from misuse or

abuse of the vocal mechanism rather than from any organic abnormality. Yet, often the actor is completely unaware of the fact that he is misusing or abusing his vocal mechanism until something goes seriously wrong with his voice. If this happens during the run of a production, he is apt to compound his problem by speaking over it, pushing his voice further, forcing it instead of resting it. A functional voice disorder can be serious enough to interfere with the actor's work or to put an end to his career entirely. If his disorder can be cured via rest and therapy, the vocal training he receives will be rehabilitory in nature because it is after the fact. However, had the actor received training earlier in his career, training which was both creative and preventative in orientation, a functional voice disorder might never have arisen. Surely this alternative is to be preferred.

The need for scientifically based voice training for the actor is only now being fully realized in the United States. This is evidenced by the increasing presence of or demand for voice specialists in various professional schools and in theatre departments at academic institutions. It was not until the August, 1969 national convention that the Voice Project of the American Theatre Association was given permanent status;[3] its first task has been to undertake an evaluation of the status of voice training programs in the United States. However, this country is not yet at a point in the development of this field where the relative merits of

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[3]Under the chairmanship of Dorothy Runk Mennen of Purdue University; at present, the chairmanship has been passed on to Dr. Robert Hobbs of Ohio University, Athens, Ohio.

alternative programs of voice training can be meaningfully evaluated. Right now, any voice training program is considered better than none, and almost any available texts or personnel are considered authoritative.

The purpose of this study is very closely related to this problem. This study attempts to identify the alterations which an actor produces in his voice as he develops a particular characterization, or in order to be both heard and understood in an auditorium. In addition, this study seeks to identify changes occurring in the actor's own voice as a result of such alterations. In this way, certain critical areas of vocal function in performance may be accurately pinpointed for purposes of future study. Furthermore, comparison of an individual actor's vocal characteristics with those of a character he portrays may provide valuable guidelines for training future actors in vocal flexibility and creativity. Assessment of the effects of a particular vocal characterization on the actor's own voice can lead to valuable insights regarding preventative voice training.

In addition, this study may perhaps provide a basis for a methodology which can be used for future studies of the actor's voice. The stronger the scientific basis becomes for understanding vocal problems peculiar to the actor, the more pragmatic his voice training can become. If such training were made available, at least two vital results could be anticipated: first, voice problems need no longer be tolerated as an unavoidable occupational hazard for the actor; and second, American actors might begin to regard and to use their voices as flexible, durable, and exciting instruments. This study is being undertaken as a beginning,

in the sincere hope that others will follow very soon, studies which will provide tomorrow's American actors with the best voice training available.

Questions and Hypotheses

There are a number of questions with which this study has concerned itself; they fall into three main areas:

1) Is it possible to determine quantitatively and qualitatively in what respects and to what extent an actor alters his vocal characteristics for purposes of performing publically or creating a particular characterization?

2) What effects (if any) do such induced voice alterations and the size of the role portrayed have on the physical condition of the actor's vocal mechanism and on the characteristics of his own voice?

3) Is there a discernible relationship between or among any of the following: previous vocal training; previous acting experience; the demands of a particular characterization; and the presence, the nature, and the severity of any objectively measurable voice problems or symptoms of problems occurring during the course of the preparation and production of a full-length show?

The effectiveness of the methodology chosen for this study will be at least partially determined by the accuracy of the following hypotheses:

1) There is a demonstrable relationship between the demands of a specific characterization and the possibility of functional voice problems in the male actor, a relationship which is directly affected by:

   a) the basic physical condition of the actor's vocal mechanism;
   b) the efficiency or lack of efficiency with which the actor uses his own voice;
   c) the type and extent of alterations the actor induces in his own voice for purposes of performance or characterization;
   d) the actor's previous training and experience; and,
   e) the particular director's knowledge of and insistence upon good voice production.

2) The greater the demands of a particular characterization on the voice of the actor who is untrained or inadequately trained vocally, the greater will be the likelihood of potential functional voice problems.

3) If and when the demands placed on such an actor's voice are lessened or eliminated, both the physical condition of his mechanism and the characteristics of his own voice will improve (i.e. return towards normalcy).

4) The beginnings or presence of a functional voice disorder in the male actor may be indicated by any one or a combination of the following:

   a) change in habitual pitch;
   b) narrowing in pitch range;
   c) deterioration in vocal quality;
   d) decrease in efficiency of breathing;
   e) decrease in length of phonation;
   f) deterioration in the physical condition of the vocal mechanism.

Background and Significance

The vast majority of voice disorders in the American populace in general and in the actor in particular arise not as a result of an organic anomaly but rather from the misuse or abuse of the voice.[4] Yet, at present there is a lack of complete understanding of just what constitutes misuse or abuse, especially in regard to an individual actor's voice.

Despite a growing recognition of the importance of caring for and training the actor's voice, little scientifically based research has been published on the subject. A survey of the literature indicates applicable research done in a number of fields. This literature, however, relates only indirectly to the needs of the actor. Without seriously

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[4]Charles Van Riper and John Irwin, Voice and Articulation (New Jersey: Prentice-Hall, Inc., 1958), p. 218.

infringing on the domain of Chapter II of this study which will review the literature in detail, it is useful to examine briefly the general nature of these contributions.

Speech pathologists have published many important studies in voice research methodology[5] and in individual vocal characteristics (e.g. pitch,[6] rate,[7] etc.), studies which can be employed by the actor in vocal characterization and by the researcher investigating the actor's voice. The limitations of the published research stem from the fact that so few studies have concentrated on the stage voice; most deal with the conversational voice.

Similarly, researcher-physicians such as Dr. F. S. Brodnitz have contributed significantly to our knowledge of functional voice disorders.[8] Limitations in this field (for which Brodnitz, incidentally, is one of the least to blame) arise from an understandable concentration on diagnostic-medical-surgical considerations rather than on functional or artistic ones.

Psychologists have indirectly but nevertheless effectively enhanced our understanding of the relationship between voice and personality;

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[5]W. Pronovost, "An Experimental Study of Methods for Determining Natural and Habitual Pitch," Speech Monographs, IX (December, 1942), 111-123.

[6]G. Fairbanks and W. Pronovost, "An Experimental Study of the Pitch Characteristics of the Voice During the Expression of Emotion," Speech Monographs, VI (1939), 87-104.

[7]G. Fairbanks and L. Hoaglin, "An Experimental Study of the Durational Characteristics of the Voice During the Expression of Emotion," Speech Monographs, VIII (1941), 85-90.

[8]See, for example, F. S. Brodnitz, "Voice Problems of the Actor and Singer," Journal of Speech Disorders, XIX (September, 1954), 322-326.

Paul J. Moses has written extensively on this topic, for example.[9] However, most psychologists have approached voice as a symptom of personality disorder rather than investigating alternative reasons for voice difficulties of more direct interest to the actor.

Music researchers have contributed some important studies on the relationship between the physiology of the vocal mechanism and timbre, vocal flexibility, registration, and control;[10] the limitation here results from their justifiable concentration on the singing voice rather than on the speaking voice.

Finally, although many theatre specialists have recognized the importance of training the actor's voice, especially for maximum flexibility and durability, more often than not they have tended to ignore or to deny the importance of a broadly-based scientific foundation for such training, preferring instead an aura of creative mystique. For example, at this time there are at least three popular textbooks used by American actors wishing to improve their voices.[11] Although each makes its own important contribution to the voice training of the actor, none of the three textbooks reports results of current experimental research in voice or discusses the need for further research in particular areas. The time

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[9]Paul J. Moses, The Voice of Neurosis (New York: Grune & Stratton, 1954).

[10]D. R. Appelman, The Science of Vocal Pedagogy (Bloomington: Indiana University Press, 1967).

[11]Arthur Lessac, The Use and Training of the Human Voice (2nd ed.; New York: DBS Publications, 1967); Evangeline Machlin, Speech for the Stage (New York: Theatre Arts Books, 1966); C. J. Turner, Voice and Speech in the Theatre (London: Sir Isaac Pitman & Sons, Ltd., 1950).

is ripe for the indefinable magic of the voice coach-shaman to be replaced with universally effective techniques of training the actor's voice. This is possible in the not too distant future, but only if two things happen first. Knowledge and research currently available from a great number of tangentially related fields must be synthesized and given direction with the actor as focus. In addition, an imposing list of questions must be answered. A consideration of many of these questions is included in the final chapter of this dissertation. They must be resolved before two broader questions can be answered:

1) Where should the main emphasis be placed in vocal training for the actor? and,

2) What are the most effective methods of achieving maximum flexibility, durability, and creativity in an actor's use of his voice?

Only intensive research will provide the information necessary to effectively and objectively answer such questions, research which this study may hopefully succeed in generating.

This study has incorporated relevant contributions made by researchers in speech pathology, medicine, psychology, music, and theatre. It has also attempted to apply these contributions to the problems peculiar to the actor. By doing so, this study may serve the needs of the actor who desires a greater working knowledge of the dynamics of vocal technique and the dangers of abuse. By identifying and emphasizing the validity of such needs, this study may provide some scientifically based guidelines for future voice courses, courses which can and should be an essential ingredient in the training of the actor, the teacher, and the director.

Definitions and Limitations

For purposes of clarity and cohesiveness, this study has limited itself to a consideration of functional voice disorders in the non-professional male actor. The decision not to include actresses in this study was made in order to avoid the addition of a number of further variables in consideration of pitch and location of major breathing activity.[12]

This study has defined a functional voice disorder as one resulting from misuse or abuse of the vocal mechanism rather than from the presence of some organic abnormality. (The end result could very well be the development of some organic change; but in the case of a functional voice disorder, the cause is confined to the misuse or abuse of a fundamentally healthy mechanism.)[13]

For purposes of this study, the non-professional actor has been defined as one who is not working exclusively as a paid member of the acting profession.

Other definitions relevant to an understanding of this study follow:

1) Habitual Pitch--the pitch on which the speaker or reader vocalizes most often; the average or modal pitch "about which the other pitches used in speech tend to cluster."[14]

2) Optimum Pitch--the pitch at which a speaker achieves the best quality and resonance with the least amount of effort.[15]

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[12]See, for example, C. F. Lindsley, "An Objective Study of the Respiration Accompanying Speech," Quarterly Journal of Speech, XXV (1929), 45-48.

[13]F. S. Brodnitz, Vocal Rehabilitation (New York: American Academy of Opthamologists and Otolaryngologists, 1959), pp. 41-42.

[14]Charles Van Riper, Speech Correction: Principles and Methods (4th ed.; New York: Prentice-Hall, Inc., 1963), p. 159.

[15]Van Riper and Irwin, Voice and Articulation, p. 449.

3) Pitch Range--the number of notes a speaker or singer is capable of phonating, from his lowest to his highest, including falsetto.[16]

4) Indirect Laryngoscopy--A physical examination in which an otolaryngologist or speech pathologist examines the condition of the vocal mechanism by using a directed beam of light and a laryngeal mirror.

Summary

A descriptive study has been done to determine 1) what alterations the actor makes in his speaking voice for purposes of public performance and the development of characterization; and, 2) what effects such alterations have on the physical condition of the actor's vocal mechanism and on the characteristics of his own speaking voice. The focal point of the study itself has been an investigation of the relationship between the demands of a specific characterization and the development of functional voice problems in the male actor.

Research foundations for the present study have incorporated contributions from speech pathology, medicine, psychology, music, and theatre. The purpose of the present study is to provide a scientific foundation for future voice training courses for actors and to establish a methodological basis for further research on the actor's voice.

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[16]F. S. Brodnitz, Keep Your Voice Healthy (New York: Harper and Brothers, 1953), p. 74.

CHAPTER II

SURVEY OF THE LITERATURE

At the beginning of this century, Dr. T. Flateau, one of the first investigators specializing in problems of the human voice, wrote a book entitled The Functional Weakness of the Voice.

> With a great wealth of observations and diagnostic detail he described the functional voice troubles of the professional speaker and singer as a well-defined vocal disease which he called phonasthenia. . . . this book marked the beginning of a new approach to vocal problems.[1]

Since then, a strong and continuing interest in the characteristics and problems of the voice has grown in this country. However, the most productive period of interest in voice research prospered toward the middle of this century only to taper off after then with the advent of specialization. The increasing sophistication of scientific and technical knowledge and the invention and increasing availability of new equipment and instrumentation were unfortunately coupled with the reorganization of large university and clinical departments into specialized divisions. Departments of Speech across the country were replaced by Departments of Rhetoric and Public Address, Speech Pathology and Audiology, Oral Interpretation, Speech Education, Radio and Television, Communication, and Theatre.

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[1]Brodnitz, Keep Your Voice Healthy, pp. 170-171.

As speech pathology, music, medicine, and theatre went their seemingly separate ways, fields of interest common to them all (such as voice and speech training) suffered. This has resulted in a needless duplication of investigation and research in some areas and in a paucity of investigation and research in others. Researchers have either wasted valuable time because of their ignorance of each other's work or neglected research into some very important areas because they felt that these areas were not part of their domains.

> Another handicap . . . is the lack of common language used in different approaches: singing teachers of various schools used different terms, terms which are not used by laryngologists, who in turn differ from speech teachers, phoneticians and music critics. It is this discrepancy of language which has hampered the cooperation of the professions in spite of common interests.[2]

According to one medical laryngologist,

> Speech and voice correction has become, particularly in America, a nonmedical field. This development has produced a tremendous growth of training facilities, with speech departments now established at practically every college and university. But within the field of speech and voice correction it has shifted the center of interest away from voice to speech disturbances. The lack of medical background of the average speech therapist prevents him too often from dealing satisfactorily with voice disturbances.[3]

The present state of affairs is extremely self-limiting. On one side stand a large number of therapists who specialize and are trained in speech pathology, for the most part, rather than voice pathology. On the other side stand a large number of otolaryngological specialists who are medically trained to diagnose and treat the physical manifestations of

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[2]Moses, The Voice of Neurosis, p. 9.

[3]Brodnitz, Vocal Rehabilitation, p. 5.

voice problems but who neither study voice correction nor teach preventative hygiene.

A great deal of what we know about the human voice, especially about functional voice disorders, is a result of the observations and writings of medically trained laryngologists, psychologists, psychiatrists, and teachers of music. Recently, however, speech pathologists have returned to an increasing involvement in establishing the scientific validity of a great deal of voice "folklore," which has been taught, for years, by voice coaches and music teachers. Here, finally, are the beginnings of a foundation upon which specialists in a number of fields can draw for accurate and reliable information regarding the human voice.

Finally, a number of contributions to this field have been made by theatre specialists. A growing number of such specialists have begun writing about voice training in this country, but actual scientific research either supporting or comparing various approaches to this training is still in its very early stages.[4] An examination of Frederic Litto's bibliography of American dissertations on the theatre[5] has revealed virtually no interest in the voice of the actor. The classification table in his bibliography included no category for voice or speech. A survey of the dissertations listed under the key words or subject headings of voice and speech revealed only four dissertations having a

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[4]The Theatre Voice and Speech Project of the American Theatre Association is in the process of compiling a survey on the status of voice and speech training in American universities and colleges; the tabulated results of a recently distributed pilot questionnaire are expected to be published some time in 1973.

[5]Frederic M. Litto, American Dissertations on the Drama and The Theatre: A Bibliography (Kent, Ohio: Kent State University Press, 1969).

performance orientation; out of these, only one related directly to the voice of the actor, and that one was written in 1935.[6]

Despite the seeming impossibility of locating and organizing enough literature to support and provide the background for a study such as this, a great deal of very informative literature does exist. At present, much of it is far too scattered, incomplete, or inaccessible to be of real value to the general reader. However, a patient researcher can find and benefit from an impressive body of available materials. For purposes of clarity, these materials have been divided into four main areas: 1) research on the characteristics of the normal speaking voice; 2) research on the effects of emotion and personality on the voice; 3) research on the etiology, diagnosis and characteristics of functional voice disorders; and 4) voice research of particular relevance to actors and other public performers.

Research on the Characteristics of the Normal Speaking Voice

General Considerations.--In attempting to identify the characteristics of the normal speaking voice, vocabulary is often somewhat misleading. There are some authors who use interchangeably words such as "normal," "average," and "optimum." However, other authors are extremely aware of the possible disparities among these terms. They point out that voice is an extremely personal function. As such, it is a product of the individual and unique history of its owner. In addition to its relation

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[6]Milton J. Cowan, "Pitch, Intensity and Rhythmic Movement in American Dramatic Speech" (unpublished Ph.D. dissertation, University of Iowa, 1935).

to that owner's age, sex, and subjection to various environmental influences, the voice minutely reflects the perpetual influences of mood, emotions, and state of health.

Unfortunately, with the complexity and pressures of contemporary American society, the majority of adult voices can be called normal only when this term is taken to mean "average" rather than "optimum."[7] Furthermore, standards for the determination of optimal voice functioning are most often vague or ill-defined, and lead to more confusion than understanding. One fortunate exception to this trend is the discussion offered by W. H. Perkins:

> Optimal vocal functioning can be defined aesthetically, acoustically and hygienically. . . . The most vital criterion, probably, from the clinician's standpoint, is vocal hygiene. Any form of vocalization abusive to the vocal mechanism would, by any conceivable standard, be undesireable. Moreover, this criterion of hygiene seems to find wide agreement across cultures. The notion that voice is produced most hygienically when it is produced most effortlessly appears to have universal agreement.[8]

Once standards are established and no longer vague, it becomes clear that the really healthy or optimum voice is found only "in the majority of pre-school children; it can be observed as a natural (untrained) performance in a number of adults; in others it will be the result of hygienic

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[7]See F. S. Brodnitz' discussions of this fact in Brodnitz, Vocal Rehabilitation, p. 41; and in F. S. Brodnitz, "Functional Disorders of the Voice," in Voice and Speech Disorders--Medical Aspects, ed. by N. Levin (Springfield, Illinois: Charles C. Thomas, 1962), p. 453.

[8]W. H. Perkins, "Vocal Function: Assessment and Therapy," in Handbook of Speech Pathology and Audiology, ed. by Lee Travis (New York: Appleton-Century-Crofts, 1971), p. 507.

voice training."[9]

The literature available at present includes material on the characteristics of the voices of both average (i.e. untrained) and superior (trained or experienced) speakers. This material is presented here under the headings of Pitch, Range, Rate, Quality, and Breathing.[10]

Pitch.--The term pitch is usually used to describe the highness or lowness of a sound or a voice in comparison with another, or as a note on the musical scale. Many authors equate pitch with the frequency of a sound in cycles per second. Although a close relationship does exist between frequency (physical) and pitch (psychological), perception of pitch is influenced by the intensity of a given tone as well.[11]

The discussion of the concepts of "normal" and "optimum" is even more widespread when it comes to pitch than it was for the characteristics of voice in general. In Chapter I of this study, definitions were provided for the terms optimum pitch and habitual pitch (see p. 11). Both of these terms have been and still are accepted and applied by speech teachers and pathologists. Yet, the existence and nature of both optimum and habitual pitch are still widely discussed.

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[9]Gertrud Lasch Wyatt, "The Application of Froeschels' Chewing Method in the Treatment of Disorders of the Speaking Voice," in The Chewing Approach in Speech and Voice Therapy, ed. by Deso A. Weiss and Helen Beebe (Basel: Friedrich Reinhardt, n.d.), p. 74.

[10]Loudness is discussed in this study only tangentially because of the paucity of published research dealing with this vocal characteristic and also because it is of only minor relevance to this study.

[11]Van Riper and Irwin, Voice and Articulation, p. 460.

A number of very popular speech improvement and speech pathology textbooks have generally defined optimum pitch as that pitch level at which the speaker's resonating chambers perform most efficiently.[12] The prevailing school of thought has been that every person has an area of voice at which he can produce a sound of good quality and more than adequate loudness with a minimum of effort. Some authors define this area in terms of a range of notes rather than just one pitch; they locate it one-fourth, or three to five notes, or some other similar interval up the range from the lowest pitch phonated.[13]

However, reputable voice teachers, notably Arthur Lessac, have taught their students how to produce tones of excellent quality and impressive power throughout the speaking and singing range by simply finding the best balance between the size of the lip opening and the location of focus for any given tone on the hard palate, something which superior speakers do naturally without any voice training. When mastery of Lessac's concepts is achieved the speaker is aware of no extra effort or extra air needed for certain pitches; and yet both the quality and the loudness of the resulting sounds are excellent at a number of different pitches.[14] Even in speech pathology research itself, Michel and

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[12]See, for example, West and Ansberry, Rehabilitation of Speech, p. 217; Van Riper and Irwin, Voice and Articulation, p. 449; and Eisenson, Improvement of Voice and Diction, pp. 88-89.

[13]Pronovost, "Determining Natural and Habitual Pitch," pp. 111-123.

[14]The author speaks here from personal experience, having trained with Mr. Lessac for eight weeks during the summer of 1972. See also Lessac, The Use and Training of the Human Voice, Chapter IX: "The Call."

Wendahl have observed that valid, supportive data for the concept of optimum pitch are difficult to locate.[15]

The concept of habitual pitch has fallen prey to much of the same criticism. Defined most simply, habitual pitch refers to the pitch level at which an individual most often vocalizes, the pitch to which he returns most often when he speaks. This pitch has been located by certain authors within a habitual range. Some authors have stated that, ideally, the speaker's optimum pitch and optimum range should coincide with those habitually used.[16]

Van Riper and Irwin have effectively summarized the case against unreserved advocation of the concept of habitual pitch:

> Certain researchers . . . have felt that the concept of habitual pitch level is meaningless. . . . Fairbanks and Pronovost . . . have shown that marked differences exist in types of utterance in terms of the emotional loading of the communication. Taylor . . . and others point to the fact that the louder we talk, the higher our pitch level becomes.[17]

In 1964, Harris and Weiss conducted a study which investigated changes in pitch associated with phonation at loud, normal, and soft voice levels. They found that "for untrained subjects the average fundamental in the loud condition increased about thirty-four per cent above normal. The soft voice condition was marked by an average fundamental about twelve

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[15]John F. Michel and Ronald Wendahl, "Correlates of Voice Production," in Handbook of Speech Pathology and Audiology, ed. by Lee Travis (New York: Appleton-Century-Crofts, 1971), p. 469.

[16]Jon Eisenson, The Improvement of Voice and Diction (New York: The Macmillan Company, 1958), p. 89.

[17]Van Riper and Irwin, Voice and Articulation, p. 296.

per cent below normal."[18]

These findings are important in assessing the value of a number of studies of the habitual pitch of the adult male voice. Richard A. Hoops, for example, reported the results of a number of such studies and concluded that in adult males, median pitch levels tend to fall somewhere around 130 cycles per second (C below middle C).[19] No information was provided in his summary, however, about the loudness levels at which pitch readings were taken.

Snidecor compared habitual pitch levels obtained in oral reading with those used for impromptu speaking and found slightly higher pitch levels for males during the readings than during the speeches. He also found that reading exceeded impromptu speaking in pitch variability.[20]

Although differences of opinion exist regarding both optimum and habitual pitch, some valuable data have been collected regarding pitch norms and variations for both reading and speaking. Van Riper and Irwin have aptly assessed the present state of our knowledge:

> It is our belief that the appropriate pitch of the larynx is indeed a function of its range, and that the most appropriate or optimum pitch is in itself a range rather than a specific tone or frequency. We further believe that this optimum range will fall in the lower portion of the total range of any given voice, but will

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[18]C. M. Harris and M. R. Weiss, "Effects of Speaking Condition on Pitch," Journal of the Acoustical Society of America, XXXVI (1964), 933.

[19]Richard A. Hoops, Speech Science: Acoustics in Speech (2nd ed.; Springfield: Charles C. Thomas, 1969), p. 58. See also Van Riper and Irwin, Voice and Articulation, p. 450.

[20]John Snidecor, "A Comparative Study of the Pitch and Duration Characteristics of Impromptu Speaking and Oral Reading," Speech Monographs, X (1943), 56.

> not include the lowermost pitches of that voice. Finally, we believe that the optimum range may vary with the actual intensity of the voice; in general, the optimum range will become higher as the fundamental of the voice increases in intensity.[21]

Range.--Much of the research on voice range can be found in journals and periodical literature by and for music teachers. Emphasis in such studies has been placed on a consideration of registration in the singing voice rather than on investigation of speaking range. Although they are interesting, most of the findings are not directly relevant to this study. In a survey which is relevant, however, Richard A. Hoops reported that, "In adulthood, both males and females have been reported to have a total pitch range of about one and two-thirds octaves and a functional pitch range of about one octave."[22] Results published by two other authors have provided basically the same conclusions: Goates found the average pitch range of a group of male actors he tested to be 10.51 tones,[23] whereas Cowan found that the average pitch range for a group of ten professional actors and actresses was two octaves, ranging from 1.28 octaves to 2.56 octaves.[24]

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[21]Van Riper and Irwin, Voice and Articulation, p. 451.

[22]Hoops, Acoustics in Speech, p. 60.

[23]W. Goates, "Pitch Changes of the Voice of Actors During Rehearsal" (unpublished Ph. D. dissertation, State University of Iowa, 1937), p. 37.

[24]Milton Cowan, "Pitch and Intensity Characteristics of Stage Speech," Archives of Speech, Supplement (1936), 80.

Rate.--A number of studies have been conducted to determine habitual rate for reading. Darley conducted a rate study for three types of material read aloud by college freshmen. The average reading rate with average material was calculated to be 167 words per minute.[25] In a study conducted by Franke, the mean reading rate was found to be 157 words per minute.[26] Cowan found the average rate of speech for all selections read by ten professional actors and actresses to be 157 words per minute, individual average rates varying from 101 to 247 words per minute.[27]

The reason that most research on rate has been concerned with reading rather than conversational speech is one of practicality:

> Much as we might like to know a person's rate of speaking, obtaining a measure of it clinically is rather awkward since it involves a recording followed by transcription of the material recorded, followed by calculation of the rate of delivery in words per minute. . . . it is generally assumed that a measure of one's rate of oral reading serves as a reasonably valid index of his rate of speaking.[28]

Kelly and Steer validated this assumption in a study of rate for extemporaneous speaking; their subjects were found to speak at a mean rate

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[25]Frederic L. Darley, "A Normative Study of Oral Reading Rate" (unpublished M. A. thesis, State University of Iowa, 1940).

[26]P. Franke, "A Preliminary Study Validating the Measurement of Oral Reading Rate in Words Per Minute" (unpublished M. A. thesis, State University of Iowa, 1939).

[27]Cowan, "Pitch and Intensity Characteristics of Stage Speech," p. 81. The great variety Cowan reported is explained by the fact that his subjects read different materials; rate in words per minute was not determined in his study via use of a uniform selection.

[28]Darley, Diagnosis and Appraisal of Communication Disorders, p. 71.

of 159 words per minute.[29] However, Snidecor reported that his comparison of reading with impromptu speaking showed that rate was faster for the former; his subjects exhibited a reading rate of 183 words per minute and a speaking rate of 151 words per minute.[30] The disparity between the reading rate Snidecor reported and those reported by other researchers cited in this section would indicate the necessity for further research.

Quality.--Research on the quality of the speaking voice has been severely hampered by the lack of precision and consequent subjectivity surrounding its evaluation and identification. Perkins has provided an excellent survey and discussion of all the confusion surrounding terminology as it relates to voice quality.[31] The underlying difficulty is a major one: it is exceedingly difficult, if not impossible, to relate the subjective perception of voice quality to its acoustic determinants. Unlike other vocal characteristics, quality has so many perceptual dimensions that even trained diagnosticians listening to the same voice at the same time will describe what they hear differently. Van Riper has summarized the difficulties involved in incorporating an

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[29]J. C. Kelly and M. D. Steer, "Revised Concept of Rate," Journal of Speech and Hearing Disorders, XIV (1949), 222-226.

[30]Snidecor, "Impromptu Speaking and Oral Reading," p. 56.

[31]W. H. Perkins, "Vocal Function: A Behavioral Analysis," in Handbook of Speech Pathology and Audiology, ed. by Lee Travis (New York: Appleton-Century-Crofts, 1971), pp. 483-497.

assessment of quality into a diagnostic voice examination.[32] Such difficulties include the multi-dimensional nature of voice quality and the necessity for reliance upon vague and imprecise adjectives to describe subjective perception. However, Van Riper concluded that despite these difficulties, an attempt to identify and evaluate voice quality should be part of standard diagnostic procedure.

Breathing.--The nature of the "correct" or most efficient way to breathe for speech has not been indisputably identified. Huyck and Allen reported that better speakers use more diaphragmatic movement when breathing for speech.[33] Drake advocated the use of abdominal breathing, on the grounds that the abdominal muscles were most capable of those directly concerned with breathing, and that concentration on the abdominal area appeared to keep tension away from the throat.[34] Studies by Gray indicated not only that no single type of breathing differentiates good speakers from poor ones but also that breathing training does not provide better speech and that newly acquired breathing patterns are only very rarely habituated.[35]

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[32]Charles Van Riper, Speech Correction: Principles and Methods (3rd ed.; Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1954), p. 311.

[33]E. M. Huyck and K. D. A. Allen, "Diaphragmatic Action of Good and Poor Speaking Voices," Speech Monographs, IV (1937), 101-109.

[34]O. J. Drake, "Toward an Improved Vocal Quality," Quarterly Journal of Speech, XXIII (1937), 620-626.

[35]G. W. Gray, Studies in Experimental Phonetics (Baton Rouge: State University of Louisiana Studies, Number 27, 1936).

The majority of researchers, however, seem to feel that any type of breathing with the exception of clavicular breathing is equally effective in producing good voice quality.[36]

Summary.--Research on the characteristics of the speaking voice has indicated that optimum voice usage occurs in only a minority of adults. More specific research has succeeded in identifying certain characteristics of average adult male voices: 1) habitual pitch has been found to be approximately 128 cycles per second, or C below middle C; 2) total pitch range in adults has been determined to be approximately one and two-thirds octaves; 3) habitual reading rate for adult males has been calculated to be approximately 160 words per minute; and 4) most researchers have reported that any type of breathing with the exception of clavicular breathing seems equally effective in producing voice of good quality.

Research on the Effects of Emotion and Personality on the Voice

A great deal has been written about the effects of emotion and related influences such as bodily tension and neurosis or psychosis on the voice. More often than not, however, these writings have tended to generalize or to present logical opinion in place of proven scientific

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[36]See, for example, Albert T. Murphy, Functional Voice Disorders (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1964), p. 18; Van Riper and Irwin, Voice and Articulation, pp. 289, 353; and Margaret L. Greene, The Voice and Its Disorders (Philadelphia: J. B. Lippincott Company, 1964), p. 19.

fact. There are, to be sure, some reports available on controlled experimentation in this field, but these are few in number. With this knowledge in mind, both types of literature may be examined: literature written on the basis of general knowledge, observation, and deduction; and literature reporting the results of scientifically conducted research. A sampling of the literature representing general knowledge and opinion will provide a good background for a consideration of more specific experimentation.

> During any emotional experience, all the total functions of the body--circulation, breathing, digestion, glandular secretion--are more or less affected, the nature of the affect being determined by the nature and intensity of the emotion. All the parts of the vocal apparatus, from the diaphragm to the lips are intimately related through the autonomic nervous system with the function of the internal organs. The neural effects of emotional disturbance in the internal organs are unconsciously transmitted to the various parts of the vocal mechanism. Manifestations of muscular tension throughout the vocal mechanism will thus conform to the nature of the emotional state, with the specific quality and intensity of each emotion experienced having their counterparts in the human voice.[37]

More specifically, there seems to be universal agreement that the experience of emotion has a discernible effect on the process of respiration in general and breathing for speech in particular. There is very strong physiological evidence for this relationship:

> Since the cerebral respiratory centers are influenced by the higher centers of cerebral regulation, such as the cortex, thalamus, and hypothalamic vital centers, it is readily understood that all states of emotional or physical excitement are promptly reflected in changes of the breathing pattern.[38]

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[37]Charles F. Diehl, "Voice and Personality," in Psychological and Psychiatric Aspects of Speech and Hearing, ed. by Dominick A. Barbara (Springfield, Illinois: Charles C. Thomas, 1960), p. 175.

[38]R. Luchsinger and G. E. Arnold, Voice--Speech--Language, trans. by G. E. Arnold and E. R. Finkbeiner (Belmont, California: Wadsworth Publishing Company, Inc., 1965), p. 23.

Research has indicated that breathing processes react to different levels of physical activity and to different states of health. In addition, rate, depth, and regularity of breathing are all subject to change under the influence of feelings of contentment, depression, fear, anxiety, anger, and grief.[39]

The effects of different emotions or of general anxiety in the individual may be observed not only during quiet breathing but during speaking or singing as well. When an individual experiences an emotion, he reacts to it totally. The reason his voice sounds different under the influence of different emotions is not only that his breathing has been considerably altered but also that the state of his body tone changes. These physiological alterations throughout the body have their effect on the musculature controlling phonation, whether the person is conscious of the results or not.

The unconscious or involuntary nature of this very intimate relationship between emotions and voice necessitates a brief consideration of the point at which normal behavior becomes deviant. This relationship between emotions, tensions, and voice characteristics is of great importance to the occurrence of functional voice difficulties. Many authors have been moving towards the conclusion that inner psychological dynamics are extremely important in the development of functional voice problems. Wyatt, for example, has attributed vocal hyperfunction to "the transformation of psychological stress into inappropriate physiological processes."[40]

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[39]Murphy, Functional Voice Disorders, p. 19. See also Brodnitz, Vocal Rehabilitation, p. 58.

[40]Frederick Wyatt, "The Psychological Diagnosis of Psychosomatic Disturbances" (Abstract), American Psychologist, 1946, p. 46.

A number of writers and researchers in speech pathology, psychology, and medicine have concerned themselves with an examination of the specific ways in which the effects of different emotions are manifested in vocal behavior. Their statements and the results of their research have indicated that emotions affect every aspect of vocal behavior: breathing, pitch, range, loudness, rate, quality, and use of force.

George Huttar conducted an experimental study of some of the relationships between emotion and the prosodic parameters of speech and reached the following conclusion:

> . . . each degree of emotion perceived in a person's speech appears to be directly related to the fundamental frequency, intensity, and speed of his speech. . . . An increase in tension and muscular activity during emotional involvement is taken to be the mediating factor which underlies the relations observed.[41]

Under conditions of stress or excitement, general bodily tension tends to affect the throat and laryngeal musculature. The voice becomes constricted or harsh in sound, and the pitch goes up. Similarly, conditions of fatigue or depression will sometimes cause a weakening in adduction and a lowering of pitch level.[42]

Information on the relationship between emotions and the range of the speaking voice has been based on the observations of practicing otolaryngologists rather than on experimental evidence. Various emotions have been observed to affect the range employed by the speaker in

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[41]George L. Huttar, "An Experimental Study of Some Relations Between the Emotions and Prosodic Parameters of Speech" (Abstract), Dissertation Abstracts, XXVIII (1968), Part 3, p. 2665A.

[42]Brodnitz, Keep Your Voice Healthy, pp. 176, 179-180. See also Van Riper and Irwin, Voice and Articulation, p. 252.

different ways. Tension, nervous excitement, and hysteria not only drive the pitch up, but also tend to keep the voice in a narrow range. Use of range has been found to be related to personality type as well.[43]

Rate of utterance or duration of phonation has been found to respond to underlying emotions too. On the basis of his analysis of recordings of ten professional actors and actresses reading dramatic materials, Cowan concluded that "There is a relationship existing between percentage of phonated time and the degree of emotional expression, unemotional speech showing considerably less time spent in phonation."[44] In another study, Wagoner demonstrated a relationship between individual temperament or emotional state and the rhythm and tempo of speech.[45]

It is not unreasonable to assume that a large number of otolaryngologists and speech pathologists would be actively investigating the multifaceted relationship between the emotions or the personality and the speaking voice. Surprisingly, and despite the literature which has been cited in this section, such is not the case. Laryngologists are still trained to diagnose from a primarily visual standpoint; symptoms are either described by the patient in terms of kinesthetic sensations or observed by the doctor with the help of a laryngeal mirror. One notable exception to this trend is in the work of Dr. Paul J. Moses who, as early as 1954, devoted an entire book to the relationship among personality,

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[43]Brodnitz, Vocal Rehabilitation, pp. 54, 84.

[44]Cowan, "Characteristics of Stage Speech," p. 82.

[45]L. S. Wagoner, "Speech as an Indication of Temperamental Traits," Quarterly Journal of Speech Education, II (1925), 237-242.

emotional factors, and vocal characteristics.[46] He believed the voice to be a reliable enough indicator of both emotional condition and personality to advocate its use as a diagnostic tool by psychologists and psychiatrists. Despite the seemingly limitless possibilities for application of this book, it has not had the impact upon professionals in speech pathology, psychology, medicine, and theatre that one would expect. There is a reasonable explanation for this failure: the book was written as a series of clinical impressions recorded over a period of time by one observer. Without actual scientific validation of the relationships observed, Moses' very valuable work has remained one man's educated speculations. A number of doctors, speech pathologists, and theatre and music specialists have remained retiscent to accept findings which lack solid scientific validation. Their somewhat justifiable position has been effectively stated by Van Riper and Irwin:

> . . . we have little real evidence for or against the thesis that variations in voice reflect basic variations in personality. Few of the studies are adequate, and the conclusions drawn are often unsubstantiated by the research itself. Once again we are confronted with our basic ignorance of human nature.[47]

Summary.--Most of the literature dealing with the relationship between voice and emotion is based on the observation of medical specialists rather than on scientifically validated experimental research. Medical specialists have observed that the experience of an emotion affects the rate, the depth, and the regularity of breathing. In addition, the degree

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[46]Moses, The Voice of Neurosis.

[47]Van Riper and Irwin, Voice and Articulation, p. 264.

of bodily tension has been found to involve the muscles of phonation, so that the voice is affected as well, in terms of pitch, range, loudness, rate, quality, and use of force.

More specific research has determined that pitch generally rises with stress and falls with grief or depression. Range has been observed to differ among individuals of various personalities. Rate has been similarly found to respond to the influence of emotions. However, until further scientific validation is available, a number of authors have remained skeptical about the relationship among emotions, personality, and voice.

Research on the Etiology, Diagnosis, and Characteristics of Functional Voice Disorders

Some years ago, Dr. Emil Froeschels offered a series of lectures on the physiology of the human voice. He introduced his subject as follows:

> I am going to talk to you about a topic which is practically non-existent in reality. Almost all the voices which we hear around us are not examples of the physiology, but of the pathology of the human voice. It sounds paradoxical, but it is nevertheless true that, with few exceptions, the well-trained voice alone functions physiologically.[48]

In addition to acknowledging the fact that most adults in this country habitually misuse their voices, available literature has strongly and without exception indicated that functional voice disorders are by far the most frequent problems which voice pathologists encounter.[49]

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[48]Wyatt, "Application of Froeschels' Chewing Method," pp. 70-71.

[49]See, for example, Van Riper and Irwin, Voice and Articulation, p. 218.

A number of criteria have been established as a basis for diagnosing a problem as a voice disorder. When significant deviations in the characteristics of the voice consistently interfere with effective communication, draw undue attention to the voice, adversely affect the audience or the speaker himself, or are inappropriate to the age and sex of the speaker, or when vocal misuse creates a physical or functional impairment of the organs of speech, then a voice disorder is said to exist.[50]

The experience of a great number of otolaryngologists and research by many speech pathologists have proven that prolonged misuse of the voice is quite capable of producing, and frequently does produce, visible organic changes in the larynx. Conversely, organic diseases, even acute laryngitis, may provide an environment which is conducive to abusive vocal behavior, behavior which perseverates and continues the cycle long after the original precipitating infection has cleared up. It is frequently difficult to distinguish clearly between functional and organic voice problems. Organic voice disorders frequently contain strongly functional elements. On the other hand, vocal abuse is quite capable of creating different kinds of organic change in the larynx.[51]

Definition.--There are so many types, degrees, and manifestations of functional voice disorders that actual, indisputable definition of the

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[50]Murphy, Functional Voice Disorders, p. 6.

[51]Brodnitz, Vocal Rehabilitation, p. 41.

term is either impossible or must be general enough to encompass all the possibilities. The definition which follows is typical:

> A functional disorder exists when: (1) there is no apparent alteration in structure detected by laryngoscopic examination; (2) the laryngoscopic examination is negative but the stroboscopic examination is positive; (3) the dysphonia is disproportionately severe in contrast to existing anatomic lesions or inflammations; (4) the disorder is of nervous origin, has variable symptoms, and is conducive to the formation of organic lesions; (5) the disorder is reversible (an organic one is irreversible); (6) function is altered (the disorder disappears when the organ is used correctly); (7) motor utilization is incorrect (therefore, it is a dysfunction); or, (8) there is a desire to mask ignorance of the exact cause.[52]

There are good reasons why any definition of functional voice disorder designed to suffer the test of applicability must be this general. When a defect of voice results from some organic anomaly, it follows a somewhat consistent pattern; if the structural abberation responsible has been identified, its effects upon the voice can be rather accurately predicted. If, however, the etiology is functional in nature, then the voice heard and the organic changes observed as a result can vary a great deal from individual to individual; no standard rules can be prescribed.

Etiology.--A summary of the most frequent causes of functional voice disorders indicates how widespread the problems categorized under this label actually are. Factors contributing to the occurrence and severity of functional voice disorders are many and diverse; they range from excessive tension to misuse of the voice and poor training.

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[52]Arnold E. Aronson, H. W. Peterson, and E. M. Litin, "Voice Symptomology in Functional Dysphonia and Aphonia," Journal of Speech and Hearing Disorders, XXIX (November, 1964), 367.

Most people in contemporary American society carry about with them varying degrees of habitual tension. This tension is general in nature and can spread to almost any area of the body. Hyperfunctional phonation, in reality, can therefore be regarded as a psychosomatic disorder; inner tensions have manifested themselves externally in tense behavioral patterns.[53] Most often, however, such hyperfunctional phonation is not serious enough to warrant clinical attention.

> Almost all of us speak with some degree of hyperfunction, but, as a rule, this deviation from the normal, although esthetically unpleasant, constitutes no major threat to ordinary function. . . . To the professional user of the speaking and singing voice any appreciable degree of hyperfunction is a potential threat because of the tendency to accumulate and spread.[54]

So long as the voice used by most people in daily life is restricted to shorter, infrequent periods of strain, chances are that no dangerous or even very unpleasant consequences will result. But for those people who use their voices either a great deal or in a very specialized way--teachers, ministers, politicians, actors, and singers, for example--even slightly incorrect functioning in the production of voice may eventually result in the production of the symptoms indicating a functionally-based voice problem.

Functional problems develop as a result of either excessive use of the voice under less than ideal conditions or as a result of misuse or abuse of the voice. However, behavior which is excessive or abusive for one individual may not be harmful for another. The occurrence of

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[53]Brodnitz, Vocal Rehabilitation, p. 47.

[54]Brodnitz, Keep Your Voice Healthy, p. 173.

functional disorders is also influenced by the native constitution of the individual, his general health and resistance to colds, and his individual reaction to stress.[55] For example, sheer amount of use of the speaking voice will not in and of itself produce a functional problem; the question of how the voice is employed rather than for how long it is used seems to be the determining factor:

> . . . The human voice when well used does not fatigue and does not afford any negative symptoms. Overuse of the speaking voice does not usually incline toward or result in dysphonia . . . (Anderson (1961, p. 18-19) writes: ". . . nor should the vocal organs become fatigued or irritated even after prolonged, steady use under normal conditions. Ordinarily, there should be no feeling of strain or tension in the throat during vocalization." In agreement are West, Ansberry, and Carr (1957, p. 76) who state: "No amount of vigorous vocalization can damage the edges of the vocal folds if the voice is properly used."[56]

Most speakers, however, especially those who perform publically, do not use their voices properly, and are consequently subject to the occurrence of functional problems.

A number of researchers in speech pathology have attempted to identify specifically those patterns which constitute improper vocal function. In 1940, Brackett produced vocal fold inflammation by deliberate use of harsh voice, and concluded that harsh voice production irritates the vocal folds whereas easy, quiet phonation does not.[57] In a subsequent experiment,

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[55]Greene, The Voice and Its Disorders, p. 95.

[56]Morton Cooper, "Modern Techniques of Vocal Rehabilitation for Functional and Organic Dysphonias," in Handbook of Speech Pathology and Audiology, ed. by Lee Travis (New York: Appleton-Century-Crofts, 1971), pp. 587-588.

[57]Isaac P. Brackett, "A Study of the Growth of Inflammation of the Vocal Folds Accompanying Easy and Harsh Production of the Voice" (unpublished M. A. thesis, Northwestern University, 1940), p. 45.

Allen and Peterson demonstrated that faulty use of pitch and intensity produced both swelling and inflamation of the vocal folds, and they relieved both these symptoms by the use of voice therapy alone.[58]

Luchsinger and Arnold have described the effects of faulty voice production as follows:

> Patients suffering from rhesasthenia, or weakness of the speaking voice, usually make the following mistakes when speaking: poorly supported respiratory movements; mumbling or sloppy articulation; speaking on too high a pitch level in relation to their natural vocal range; tense or strained phonation with hard glottal strokes; and speaking too loudly in an effort to overcome poor vocal projection.[59]

A more specific examination of some of these "mistakes" makes possible the identification of the point at which acceptable behavior becomes deviant enough to result in functional difficulties.

Research and medical observation have shown that the voice can be damaged through the use of wrong breathing (i.e. the area of greatest muscular activity during breathing for speech is not the most efficient), wrong force (i.e. far too much muscular effort is habitually involved in phonation), and wrong pitch (the pitch employed by the speaker lies outside his optimum vocal range). However, it is important to remember that voice is a complex process during which a number of contributing functions are combined to produce sound. In most cases, disturbances in one of these functions will affect the voice as a whole.[60] Problems of

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[58]B. Allen and G. E. Peterson, "Laryngeal Inflammation in a Case of Falsetto," Journal of Speech Disorders, VII (1942), 175-178.

[59]Luchsinger and Arnold, Voice--Speech--Language, p. 314.

[60]Brodnitz, Keep Your Voice Healthy, p. 170.

breathing, force, and pitch are discussed separately here for purposes of clarity, but most often occur in combination.

The majority of voice researchers have expressed the belief that all types of breathing with the exception of clavicular breathing are acceptable in the healthy production of voice (see p. 26). The predominance of clavicular breathing, on the other hand, is very frequent in disturbed voices.[61] High chest breathing causes functional voice problems for at least two basic reasons: 1) the breathing is not efficient, because the speaker must work too hard muscularly and breathe too often using this method alone to get sufficient air for speaking; and 2) the lifting of the shoulders which is characteristic of clavicular breathing stiffens the muscles in the neck and pharynx. It is extremely easy for this stiffness or tension to seep into the intrinsic muscles of the larynx, thereby producing hyperfunction and vocal complications.[62]

Many individuals employ excessive muscular force in their phonation as a result of general tension and in conjunction with incorrect breathing. Another contributing factor to hypertense phonation is the absence of acutely discriminating kinesthetic sensation within the larynx.

> The various muscles which control the laryngeal form and movements are small and delicate, especially that [sic] situated within the substance of the vocal cord itself. If, for example, the muscles of a limb are exercised too violently or for too long they begin to ache. We have been warned to rest. Most unfortunately no such warning ache occurs in these small larynx muscles, as it may in the throat and neck. Consequently the singer may employ these too violently (e.g. by singing too loudly or at too high pitches) and

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[61]Brodnitz, "Functional Disorders of the Voice," p. 466.

[62]Brodnitz, Vocal Rehabilitation, p. 56.

> for too long. The first laryngeal warning is a "weakness" or "hoarseness" of the voice, due to the tired laryngeal muscles failing in their firming, thinning or opposing actions of the cords. . . . Such over-use continued for years leads to a permanent weakness of the muscles concerned.[63]

This type of syndrome is by no means confined to the singer but affects all types of public speakers as well. Froeschels, in an extremely important paper dealing with vocal hyperfunction, listed seven different types of hyperfunction which occur while singing or speaking.[64] Each was found to be located at a different point along the vocal tract--e.g. the vocal folds, or the back of the tongue, or the walls of the pharynx. He also found that the same individual may exhibit certain of these hyperfunctions while singing and the same or other hyperfunctions during speech. Froeschels found this classification useful for purposes of diagnosis, but also observed a great functional unity among groups of muscles participating in the process of phonation. Hyperfunction rarely, if ever, affects only one part of the vocal mechanism.[65] The vicious cycle may actually begin at any one of a number of different points and may be precipitated by a number of different factors, but it very quickly engulfs other areas along the vocal tract until the entire process is affected.

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[63]Norman A. Punt, The Singer's and Actor's Throat (2nd ed.; London: William Heinemann Medical Books Ltd., 1967), p. 60.

[64]Emil Froeschels, "Laws in the Appearance and the Development of Voice Hyperfunctions," in Selected Papers of Emil Froeschels: 1940-1964 (Amsterdam: North-Holland Publishing Company, 1964), pp. 139-142.

[65]Froeschels, "Hygiene of the Voice," in Selected Papers of Emil Froeschels: 1940-1964, p. 150. See also Brodnitz, Vocal Rehabilitation, pp. 45-65.

> Habitual hyperkinetic dysphonia is characterized by the excessive contraction of all muscles participating in phonation. Not only the laryngeal muscles but also the entire respiratory apparatus and the cervical suspension muscles of the larynx are involved in excessive function. This fact is not surprising in view of the global nature of all expressive acts of communication. Vocal overexertion is of involuntary nature in the sense that it is not consciously intended. For various reasons, increased vocal efforts are made when speaking until these excessive patterns become a habit from which the afflicted patient can no longer break loose.[66]

Depending on both the type and the extent of vocal abuse, a functional voice problem may occur quite suddenly or may develop gradually. Similarly, its symptoms might disappear relatively quickly or persist over a long period of time. Most people have become hoarse or have felt a temporary soreness in the throat after cheering loudly at a football game, after speaking with someone while doing strenuous physical exercise, or perhaps even after addressing a large group or a day of teaching. For many people the hoarseness or soreness disappears with rest. Other individuals suffer hoarseness or complete loss of voice which occurs quite suddenly and without any warning. Such individuals may be experiencing the cumulative effects of forcing the voice; precipitating factors in such cases include crisis, overwork, illness, or anxiety.[67] In discussing noninfective and acute laryngitis (i.e. acute inflammation of the laryngeal mucosa attributable to causes other than infection), Jackson and Jackson have stated that some sort of trauma--shouting, screaming, excessive use of force, and even coughing--is the most frequent cause.[68]

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[66]Luchsinger and Arnold, Voice--Speech--Language, p. 303.

[67]Greene, The Voice and Its Disorders, p. 96.

[68]Jackson and Jackson, Diseases of the Nose, Throat, and Ear, p. 587.

Greene has similarly stated that coughing in and of itself may be sufficiently frequent and violent to damage the vocal folds.[69] Laryngitis resulting from such traumas subsides after a few days of vocal rest. However, the accumulation of traumatic treatment of the vocal folds may eventually cause persistent laryngitis when the damage becomes chronic.[70]

In addition to functional abberations, a number of other elements contribute their effects: e.g. physical illness such as colds or laryngeal infections; the effects of tobacco and dry, dusty atmosphere; faulty voice technique; and negative emotional factors.

Many professional voice users have observed a relationship between the beginning of their functional voice problems and a respiratory infection--a cold, influenza, or infectious laryngitis. Speaking, singing, or acting during a respiratory infection can be harmful; kinesthetic cues are affected, and the voice user, in an attempt to work despite his illness, uses his voice in ways which are functionally incorrect.

> The smooth corrdination of automatic breath control depends, to a large extent, on proprioceptive reflexes and kinesthetic sensations. If they are disturbed, the automatism of breathing is disturbed. This can be observed in such a minor event as acute laryngitis. Froeschels studied respiratory movements by pneumography during acute laryngitis. While quiet respiration remained normal, it became quite erratic during speaking and singing, with increased frequency of breathing and marked irregularity of respiratory movements. This observation suggests an explanation for the onset of some of the functional voice disturbances in professional users of the voice. Singing, acting or public speaking during acute laryngitis may set a pattern of wrong respiration that remains after the acute inflammation of the cords has disappeared.[71]

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[69]Greene, The Voice and Its Disorders, p. 108.

[70]Arnold, "Nodules and Polyps," p. 208.

[71]Brodnitz, Vocal Rehabilitation, p. 55.

Respiration is seldom the only activity to be adversely affected by colds, influenza, and infections. Infection of the respiratory tract impairs vocal function as well. As a matter of fact, the degree of disturbance in the voice is very often out of proportion to the acute organic changes due to respiratory infection.[72] The mechanism regulating voice is complex and finely adjusted enough to be easily unbalanced by any change in the condition of the body.

Unfortunately, many young actors and singers, and even those who have worked professionally for years, are unaware of the seriousness of working through a cold, especially in a vocally-demanding role or in environmentally adverse conditions. If they continue to perform instead of resting their voices, the results may be serious. In order to overcome temporary weakness or imbalance caused by illness, the speaker or singer most often uses excessive force; new patterns of voice production are established, patterns which persist after the precipitating infection has cleared up.[73]

Smoking too has been strongly related in the literature to the occurrence of functional voice disorders. Even if more general health hazards are ignored, the inhaled smoke has been shown to serve as a direct irritant to the mucous membranes in the throat.[74] Such irritation may in turn lead to vocal misuse, which may then result in still further

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[72]Brodnitz, Keep Your Voice Healthy, p. 138.

[73]Ibid., pp. 175-176.

[74]Ibid., p. 96.

irritation.[75] It has also been observed that the smoke from the cigarettes of others can be as irritating to the throat as your own.[76] Nor is cigarette smoke the only dangerous inhalant. Voice strain can be complicated by other negative environmental influences as well. For example, if and when the membranes in the larynx are rendered sensitive by vocal abuse, irritants such as dust or a very dry atmosphere may induce coughing which in turn further aggravates the already existing damage.[77]

Even if the professional voice user is basically healthy and has a sound laryngeal mechanism, and even if he knows enough not to work through a physical illness affecting his respiratory tract or to use tobacco, he can still develop serious functional voice problems because of either a lack of vocal training or vocal training which was deficient or incomplete.[78] It has also been observed that faulty singing technique, involving excessive contraction of the laryngeal muscles or "pushing," may fatigue those muscles and thereby negatively affect the speaking voice as well.[79]

Brodnitz has attributed a great number of the functional voice problems which he has treated to a lack of voice training in professional users.[80] He has described a classic pattern of misuse in actors, for

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[75]Cooper, "Modern Techniques of Vocal Rehabilitation," p. 587.

[76]Brodnitz, Keep Your Voice Healthy, p. 156.

[77]Greene, The Voice and Its Disorders, p. 92.

[78]Ibid., p. 99.

[79]Luchsinger and Arnold, Voice--Speech--Language, p. 305.

[80]Brodnitz, Keep Your Voice Healthy, pp. 175-176.

example. The actor who lacks voice training to begin with may have to contend with heavy professional vocal demands. This quantitative burden may in turn cause vocal fatigue, which the actor counters by using extreme force. If new and persistent patterns of phonation are established in this fashion, eventual functional voice difficulties are very likely to occur. Brodnitz has also observed that the lack of technical training characteristic of most American actors and many singers as well makes their voices even more vulnerable to the effects of emotional tensions and anxieties. In addition to the strong and sometimes violent character emotions which the actor internalizes and which may influence the characteristics of his own voice (see pp. 65-66), he must contend with his own personal emotional environment as a human being. Emotional factors have been found to be quite capable of precipitating or aggravating or even causing all by themselves the occurrence of a functional voice problem. In some cases, to be sure, the problem is basically one of technical misuse, with emotional factors contributing almost incidentally. In other cases, however, the basis for the disturbance may be decidedly neurotic.[81]

Punt has discussed the effect of emotional upset on the lubrication of the oral cavity. He feels that this lubrication problem is at the basis of many functional voice difficulties encountered by the public performer:

> Of comparable importance to the effect of anxiety on coordinated muscular action is the frequently neglected effect on the lubrication of various moving parts of the throat. . . . the mouth and tongue are lubricated mainly by saliva, and the pharynx and the larynx

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[81] Ibid., p. 189. See also Froeschels, "Laws in the Appearance," p. 142; and Froeschels, "Hygiene of the Voice," p. 150.

> mainly by mucus. The few large glands which secrete . . . the saliva and the very many minute glands which secrete mucus are influenced in their function partly by psychological factors. Anxiety causes a reduction in their output, and consequently produces the most troublesome dry mouth and throat with tongue clinging to the roof of the mouth--experienced and dreaded by all public performers, though strangely neglected by medical men.
>
> In recent years the present writer has become more and more impressed with the importance of this lubrication. It is remarkable how much punishment a well-lubricated larynx will stand, whilst a dry throat is a constant trial to the performer.[82]

The importance of emotional factors in the occurrence of functional voice difficulties should not be underestimated. For example, Brodnitz has gone so far as to say:

> In all forms of functionally based voice disturbance, the impact of psychogenic forces plays a major role in producing vocal dysfunction and even tissue alterations.[83]

To summarize briefly, a number of factors contribute to the etiology of functional voice disorders. General bodily tensions, for example, tend to spread and to affect the internal muscles of the larynx which control phonation. Type and amount of actual voice usage may be excessive enough to cause functional problems, although the point at which misuse becomes excessive may vary with individual constitution. Improper use of the voice through poor breathing, excessive force, or incorrect use of pitch may lead to functional problems as well; very often these difficulties occur in combination. Although hyperfunction may originate in one specific location along the vocal tract, it tends to spread and to generalize very quickly, setting up a more non-specific hyperphonational pattern.

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[82]Punt, The Singer's and Actor's Throat, pp. 10-11.

[83]Brodnitz, Vocal Rehabilitation, p. 36.

Complicating factors in the occurrence of functional voice disorders include respiratory infection, cigarette smoking and the inhalation of other irritants as well, deficient or incomplete voice training, and the emotional environment in which the voice user exists. Although the combination of these contributing factors may vary from one individual to another, the impact of emotional factors must always be taken into consideration in cases of functional disorder.

Symptoms.--There are many symptoms associated with the occurrence of functional voice disorders. Some of them can be observed or heard by the diagnostician and others can be described or discussed by the patient, but virtually none of them, by itself, will positively identify the problem as being one of functional misuse. When the patient is seen by the examiner, he may be in any one of a number of stages of functional voice disorder.[84] Therefore, diagnosis is somewhat difficult and is usually accomplished by obtaining many types of information--seen, heard, sensed, elicited, before combining these to formulate the most reliable opinion. For instance, before the patient speaks or describes his condition, the examiner obtains valuable information by simply observing his appearance and behavior. The first important clues are provided by the patient's habitual mode of respiration.

For example, the predominance of clavicular breathing with its raising of the shoulders and tightening of the neck muscles is a strong

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[84]Aronson, Peterson, and Litin, "Voice Symptomology," p. 377.

indication of functional involvement; Brodnitz referred to it as "a danger symptom of the first order."[85] The breathing may also provide valuable information as to what stage of functional disorder the voice is in. In hyperfunction, the breathing is quite strenuous, in order to overcome the tension present in the throat, tongue, and laryngeal musculature. In hypofunction, the breathing may be shallow, and the passage of air may be audible during phonation due to the weak adduction of the vocal folds.[86]

Of further diagnostic value is the observation of the degree of tonus in the patient's muscles. In many individuals with functional voice problems, the muscles of the body, even in a state of rest, are considerably tensed. The examiner may observe stiff posture, lifted shoulders, stiff jaw, facial grimaces, tensed hands, or protruding blood vessels on the neck. Murphy has stated:

> It is unlikely that extreme tension of the vocal folds alone can occur; ordinarily, the entire laryngeal structure is involved. This is also accompanied by restricted jaw and lip movement. The back of the tongue may be retracted. The supra-hyoids are rock-like in phonation when palpitated. Tautness and inflexibility of the chest and abdominal structure may be evident. . . . All of these features produce a rigidity of surfaces and cavity constriction. . . .[87]

In addition to general observation of the breathing and degree of habitual tension in the subject, the examiner can listen to the sound of the voice. Symptoms which are heard are just as important in diagnosis of functional voice problems as those which are seen. However, it is

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[85]Brodnitz, Keep Your Voice Healthy, p. 181.

[86]Ibid., p. 180.

[87]Murphy, Functional Voice Disorders, p. 64.

quite difficult to accurately describe auditory phenomena in written terms. To an experienced and sensitive examiner, barely perceptible changes in voice will indicate improper function; to an untrained examiner, the lack of major alteration can be either misleading or confusing.

The experienced diagnostician will not wait for the subject to speak to him at length; there are important auditory symptoms which he can detect immediately. Jackson and Jackson have observed, for example, that in many patients with functional voice problems, there is a need for clearing the throat before speaking.[88] It may have become so habituated that the patient is unaware of it, but it is an extremely prevelant tendency in professional voice users. Once the patient begins to speak with the examiner, the sound of the actual tone produced also provides many clues as to the nature of his voice difficulty. There are many descriptions of the auditory symptoms of functional voice disorder in the literature. Even the least specific authors have stated that hyperfunction tends to raise the habitual pitch and that hypofunction tends to lower it. Several writers have observed that a diagnosis can never be made on the basis of auditory symptoms alone; they must be added to the list of visual and kinesthetic symptoms before an accurate diagnosis can be achieved. However, the particular auditory symptoms exhibited by the subject often indicate his stage of functional disorder. Cooper summarized the auditory symptoms of functional misphonia as follows:

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[88]Jackson and Jackson, Diseases of the Nose, Throat, and Ear, p. 596.

> The auditory aspect may be noted in: acute or chronic hoarseness; reduced vocal range; inability to talk at will and at length in variable situations, such as direct conversation or on the phone without vocal fatigue; tone change from a clear voice to a breathy, raspy, squeaky, foggy, or rough voice; repeated loss of voice; laryngitis; voice breaks; voice skips; voice comes and goes during the day or over a period of months; clear voice in the morning with tired or foggy voice in the afternoon or evening; and missed speech sounds.
>
> The most typical auditory symptom is hoarseness; the hoarse voice that does not present a pathological cause is frequently seen by the laryngologist.[89]

The importance of alterations in pitch is somewhat controversial. Jackson and Jackson have observed that in cases of myasthenia laryngis, although hoarseness is the chief symptom, it is most often accompanied by a lowering of the habitual pitch during conversation.[90] However, when Shipp and Huntington conducted experimentation to verify this observation, they found no significant difference in fundamental frequency (pitch) between the normal voices and the hoarse voices of subjects suffering from acute laryngitis. They explained their findings as follows:

> The finding of no significant difference between the two voice conditions in either mean or median fundamental frequency is in disagreement with statements in the literature that hoarse voice is typically lower in pitch than normal voice. It can be assumed that the type of hoarseness alluded to in the literature may differ in kind from the acute-laryngitic hoarseness investigated in the present study; or it may be that some characteristic of hoarseness causes it to be perceived as lower in pitch than in the non-laryngitic voice although the mean fundamental frequencies of the two conditions are similar.[91]

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[89]Cooper, "Modern Techniques of Vocal Rehabilitation," pp. 593-4.

[90]Jackson and Jackson, Diseases of the Nose, Throat, and Ear, p. 587. See also Van Riper and Irwin, Voice and Articulation, p. 203.

[91]Thomas Shipp and Dorothy A. Huntington, "Some Acoustic and Perceptual Factors in Acute-Laryngitic Hoarseness," Journal of Speech and Hearing Disorders, XXX (November, 1965), 357.

On the basis of this research, however, Shipp and Huntington did discover that the laryngitic subjects used a very restricted pitch range when speaking. Although this fact had not been previously discussed in the literature, they concluded that laryngitic hoarseness is very closely related to severe restriction in pitch range.[92]

A number of authors have further noted that hyperfunctions are most noticeable at the limits of the vocal pitch range.[93] Punt's observations are most specific in this regard:

> Commonly there is a difficulty in singing high notes softly, the reason being that thickened or irregular vocal cords or those with weakness of their muscle components cannot be stiffened and thinned, and so high notes can only be achieved by raising breath pressure and forcing air through tightly opposed cords--which notes cannot but be loud, as well as shrill. . . . [94]

Luchsinger and Arnold concurred with Punt's observations in their summary of auditory symptoms. Besides observing difficulties in singing the high notes softly, they described various degrees of hoarseness at points in the vocal range and increasing difficulties in achieving smooth register transitions in patients misusing their voices.[95]

The information with which a patient provides the examiner regarding the history and characteristics of his difficulty are also of diagnostic importance. For example, one of the few symptoms which seem to be common to all voice disorders of a functional nature is the increase in vocal

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[92] Ibid., pp. 357-358.

[93] See, for example, Murphy, Functional Voice Disorders, p. 27.

[94] Punt, The Singer's and Actor's Throat, p. 67.

[95] Luchsinger and Arnold, Voice--Speech--Language, p. 309.

difficulty under extended use of the voice.[96] "Extended" here is a relative term, depending not only on what sort of demands are made on the voice and how often but also on the constitution of the voice user and the stage of debilitation which his laryngeal muscles have reached. An individual suffering from voice dysfunction may be observed to exhibit a pattern of hyperfunction and hypofunction in the course of a single day. Early in the day, he begins work with a hyperfunctioning, tense voice. By the end of a day of continued use, the voice progressively weakens until the hypofunctional element takes over and the voice is quite weak and breathy.[97] In describing his own perception of the hoarseness of his voice, the subject is most likely to observe that the hoarseness is worse in the morning before the nocturnal accumulation of mucous has been eliminated or in the evening after prolonged use of the voice. One must be careful, of course, to observe and listen for himself, rather than to trust completely to the patient's own appraisal of his problem:

> . . . the awareness of the patient of his vocal impairment in no way parallels the actual degree of dysphonia. What to a singer is a high degree of vocal dysfunction may be hardly noticeable to a person who uses his voice only as an instrument of ordinary conversation.[98]

Kinesthetic or sensory symptoms of voice problems are extremely great in number and varied in kind. Cooper has summarized them most effectively:

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[96]Brodnitz, Vocal Rehabilitation, p. 42.

[97]Ibid., p. 45.

[98]Ibid., p. 42.

> The sensory symptoms are: nonproductive throat clearing; coughing; progressive vocal fatigue following brief or limited vocal use; acute or chronic irritation or pain in or about the larynx or the pharynx; sternum pressure and/or pain; neck muscle cording; swelling of veins and/or arteries in the neck; throat stiffness (Glassburg, 1925); rapid fatigue and voice breaks (Hunt, 1906); a feeling of a foreign substance or "lump" in the throat; ear irritation or tickling; repeated sore throats, a tickling, a tearing, soreness, or a burning sensation in the throat; scratchy or dry throat; tenderness of anterior and/or posterior strap muscles; rumble in the chest; stinging sensation in the soft palate; a feeling that talking is an effort; a choking feeling; tension and/or tightness in the throat; earache; back neck tension; headache; and mucus formation (Russell, 1936, and Mithoefer, 1940). Other symptoms may include arytenoid tenderness, trachael pressure, anterior or posterior cervical pain, and pain at the base of the tongue (Brewer and Briess, 1960a).
>
> Almost all patients complained of one or more of the above symptoms. The most common symptoms were vocal fatigue. . . ; throat clearing . . . ; and coughing. . . .[99]

Although negative kinesthetic sensations are most prevalent in sufferers of functional voice problems than are those which can be seen and sometimes even those which can be heard, some of them do not appear until after the abusive vocal behavior has been established. There is a strong physiological basis for this occurrence: the tiny muscles controlling laryngeal activity do not ache appreciably, and it is not until the muscles of the pharynx become involved that the speaker or singer is warned. By this time, the laryngeal muscles have probably been considerably overworked, and complete failure to respond is possible.[100]

As widespread and varied as sensory symptoms are, their absence is not a valid basis for ruling out the existence of functional voice difficulties in a subject. When the quality of the voice is hoarse and there

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[99]Cooper, "Modern Techniques of Vocal Rehabilitation," p. 593.

[100]Punt, The Singer's and Actor's Throat, p. 55.

is a lack of throat irritation, this may be indicative of longstanding vocal abuse; the voice user may have once exhibited corresponding kinesthetic symptoms, but no longer does so.[101]

The ability or lack of ability of a subject to kinesthetically tolerate an indirect laryngoscopic examination is still another indication of the presence of functional voice difficulties. The well-trained speaker and singer are generally easy to examine. If the tongue moves forward easily and throat is relaxed, the vocal folds can be seen quite easily. However, the patient with hyperfunctional difficulties constricts the throat and pulls back the tongue frequently during laryngeal examination. Observation of the vocal folds becomes possible only in glimpses.[102]

When the examiner does succeed in observing the appearance and function of the vocal folds, what he sees will give him the final type of information he has available in making his diagnosis. As a matter of fact, what he sees may be the determining factor in differentiating between functional and organic voice problems. Functional problems can be seen, felt, or heard in varying combinations--they can sometimes be seen; they can usually be felt; and they can almost always be heard. Organic abnormalities in the larynx can most often be seen, felt, and heard.[103]

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[101]Cooper, "Modern Techniques of Vocal Rehabilitation," p. 594.

[102]Brodnitz, Keep Your Voice Healthy, pp. 173-174. See also Brodnitz "Functional Disorders of the Voice," p. 458; and William Zerffi, "Voice Reeducation," Archives of Otolaryngology, XLVIII (1948), 522.

[103]Cooper, "Modern Techniques of Vocal Rehabilitation," p. 594.

In a state of health, the vocal folds look thin, sharp-edged, and pearly white in color, in contrast to the light pink of the laryngeal mucosa. In the first stages of functional voice difficulty, there is little if any change in the laryngeal appearance. The disparity between the voice difficulties described by the patient or heard by the examiner and this seemingly healthy appearance of the vocal folds is, in fact, characteristic of the beginning stages of most voice disorders of functional origin.[104]

If the functional disorder is in a slightly more advanced stage, there will be some change in the appearance of the vocal folds visible to the examiner's eye. The most valid observation is a comparative one; if the appearance of the vocal folds of the subject is noted in health (i.e. when the voice is not professionally misused, when the subject is not suffering pain or discomfort or experiencing fatigue), then the examiner can be far more accurate in his perception of any change in that appearance. If color, motility, and adduction of the cords are observed in days of health, pathologic findings can be more reliably diagnosed in time of complaint. For example, a blood vessel on or marked pinkishness of the vocal folds which has already been observed during days of health will not be misinterpreted by the examiner as a symptom of acute disease.[105]

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[104]Luchsinger and Arnold, Voice--Speech--Language, p. 310.

[105]Brodnitz, Vocal Rehabilitation, p. 34. See also Friedrich S. Brodnitz, "The Voice of the Speaker and Singer," in Voice and Speech Disorders: Medical Aspects, ed. by Nathanial M. Levin (Springfield, Illinois: Charles C. Thomas, 1962), p. 447.

When visible symptoms do occur in cases of functional origin, they do not follow hard and fast rules, but vary in appearance, severity, and combination.

> Laryngological findings in typical cases of phonasthenia include the following: mild signs of pharyngitis; inflamation of the "lateral bands' of residual adenoid tissue on the posterior pharyngeal wall following tonsillectomy; slight reddening of the vocal cords, or injection of the chordal blood vessels; slight reddening of the vocal-cord margins, known as "marginal chorditis;" slight increase of laryngeal mucous secretion; . . . [106]

The type and duration of the functional problem, as well as the physical resistance or susceptibility of the subject to stress, will determine the appearance of the folds. The vocal folds of a patient with acute laryngitis may exhibit many kinds of changes, ranging from pink coloration to deep reddening, from slight congestion to severe swelling. It is also very important to remember that all vocal folds may show some change in appearance under physiological use or strain. For example, a pinkishness may be seen when examining a singer or an actor during an intermission or immediately after a performance. How long the hyperemia lasts may be a criterion of the amount of strain which that performer has placed upon his vocal mechanism.[107]

In discussing the diagnosis of noninfective acute laryngitis (i.e. laryngitis due to causes other than infection), Jackson and Jackson have observed that the laryngeal appearances are diagnostic. "On examination

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[106]Luchsinger and Arnold, Voice--Speech--Language, p. 310.

[107]Nathaniel M. Levin, "The Professional Singer," in Voice and Speech Disorders: Medical Aspects, ed. by Nathaniel M. Levin (Springfield, Illinois: Charles C. Thomas, 1962), p. 487.

with the laryngeal mirror the mucosa appears diffusely reddened except the cords, which usually seem pink. If a hematoma is present its deep crimson color will make the cords seem paler."[108] Brodnitz has observed that hemorrhages are frequently seen in laryngologic practice and occur after any kind of vocal abuse.[109]

Once misuse becomes chronic, the appearance of the vocal folds may undergo further change. Jackson and Jackson, for example, have described the appearance of the larynx of an individual suffering chronic laryngitis:

> The redness of long-standing chronic laryngitis is patchy. The illusion of pearly luster of the reflected image of the cords is absent; the color is pinkish early, grayish later, but in either stage the surface appears slightly roughened, dull, and lusterless. The cords lack the illusion of thinness, flatness, and sharpness that characterizes the normal reflected image; but at the early stage the edges appear only slightly rounded.[110]

Therefore, if the examiner is familiar with the appearance of the larynx and vocal folds in days of health, he may be able to determine on the basis of visual examination whether the vocal folds are in an abnormal condition. However, laryngoscopic findings are not in themselves indicative of the cause of observed abnormalities; inflammation or discoloration or the presence of mucous are symptomatic not only of functional voice disorders but of infectious laryngitis and a number of organic voice problems as well.[111] It therefore becomes necessary to

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[108]Jackson and Jackson, Diseases of the Nose, Throat, and Ear, p. 587.

[109]Brodnitz, Vocal Rehabilitation, pp. 62-63. See also Brodnitz, Keep Your Voice Healthy, p. 174.

[110]Jackson and Jackson, Diseases of the Nose, Throat, and Ear, p. 596.

[111]Brodnitz, Vocal Rehabilitation, p. 60.

diagnostically differentiate among these various problems. To an extent, this is quite possible.

Hayashi conducted research on the visual symptomology of functional voice problems. He reported that in the case of upper respiratory infections, both folds are usually equally inflamed, whereas in cases of acute functional misuse, one vocal fold appears to be more affected or inflamed than the other.[112] A second method of differentiation may be possible, but only if the examiner has enough time at his disposal. Trauma to the vocal folds which has been caused by excessive pounding of their inner margins can result in a small hemmorhage and/or swelling of the mucous membranes, but these symptoms may disappear rapidly with voice rest.[113] If the examiner has the opportunity to rest his subject and then to re-examine him, the information received from such a comparative examination can be of important diagnostic value.

In addition to viewing appearance, texture, color, and degree of swelling in the vocal folds, it is standard procedure in laryngological examinations for the examiner to have the subject phonate a high-pitched "eeeee" sound so that he can observe the physiology of the larynx during phonation. There are functional abnormalities which the diagnostician may be able to observe even during the course of his laryngoscopic examination. The movable parts of the larynx may be observed to be no longer capable of a full range of activity. Facility in achieving both coarse

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[112]Y. Hayashi, "Unilateral Inflamed Vocal Cords in Singers," Oto-Rhino-Laryngologica, IX (Tokyo, 1936), pp. 250-254.

[113]Greene, The Voice and Its Disorders, p. 107.

and fine movement is characteristic of the healthy or well-trained voice. In the healthy larynx, the various muscles regulating the stiffness of the folds by their stretching and firming actions, and the muscles controlling the shape and adduction of the folds, are capable of extremely delicate and precise adjustment.[114] In the larynx of an individual who has misused his voice, however, muscular activity is quite different.

For example, Murphy has observed that in some cases of serious hyperfunction the force of muscular contraction is so great that laryngoscopic examination reveals an actual crossing over of the vocal folds during phonation.[115] In advanced cases of phonasthenia (i.e. weakening of the voice), the longstanding hyperfunction has weakened the internal muscles of the larynx to the extent that the vocal folds are no longer capable of efficient adduction. In other words, functional voice problems tend to progress chronologically from a characteristic state of hyperfunction to a characteristic state of hypofunction. The tremendous effort and contraction of many muscles which can be observed in earlier stages wear out the internal muscles of the larynx, making them weak and inefficient. When the subject is asked to phonate during a laryngoscopic examination, the examiner can observe a bowing or inefficient adduction of the vocal folds. In addition, he can hear the breathy, weak, inefficient voice which results from their inability to perform normally.[116]

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[114]Punt, The Singer's and Actor's Throat, p. 34.

[115]Murphy, Functional Voice Disorders, p. 27.

[116]Brodnitz, Vocal Rehabilitation, p. 46. See also Froeschels, "Hygiene of the Voice," p. 151; and Murphy, Functional Voice Disorders, p. 27.

To summarize, there are many symptoms associated with the occurrence of functional voice disorders. These symptoms vary in number, in kind, in severity, and in combination, but their presence or absence is important to accurate diagnosis. Symptoms which are seen or heard by the examiner in addition to those which are experienced by the patient must be considered in determining diagnosis.

The predominance of clavicular breathing is frequently a strong indication of functional involvement. Type of breathing may also indicate the stage of functional disorder which the patient has reached at the time of his examination. Degree of muscular tonus and evidence of general bodily tension are similarly important in the determination of functional abuse.

Auditory symptoms of functional disorder are also important. Many patients habitually and frequently clear their throats before speaking. Habitual pitch may be raised by hyperfunction and lowered by hypofunction of the laryngeal muscles. The voice itself is frequently hoarse in quality and may skip or break during phonation. In addition, pitch range may be comparatively restricted and high notes frequently cannot be sung softly. In singers, transitions between registers may lack ease or smoothness.

Commonly, the victim of functional disorder reports an increase in vocal difficulty under extended use of the voice. The voice may be best in the morning or at the beginning of the business week, progressively worsening thereafter as continual usage causes debility and discomfort. Kinesthetic symptoms such as these are extremely great in number and varied in kind. However, their absence is not a valid basis for ruling out functional misuse of the voice.

The lack of ability of a subject to tolerate a laryngoscopic examination is yet another indication of functional involvement. When the examiner is able to observe the appearance and motility of the vocal folds and laryngeal muscles, he may see no organic involvement during the early stages of functional misuse, or he may see various organic symptoms of functional misuse characteristic of later stages. When visible symptoms do occur in cases of functional origin, they vary greatly in appearance, severity, and combination. Symptoms include inflammation of throat and laryngeal mucosa, swelling, discoloration of the vocal folds, and local hemmorhages. Upon phonation, the vocal folds may be observed to cross over one another, or to adduct imperfectly, resulting in bowing and in the escape of unphonated air. In a number of cases, such symptoms will disappear or improve with vocal rest.

The presence or absence of many symptoms of functional misuse is dependent upon the duration and extent of misuse and on the general physical condition of the patient; if he has been examined in times of health, the diagnosis made in time of complaint tends to be most valid.

Classification.--The symptoms just discussed have a tendency to group themselves into patterns characteristic of different functional disorders. Review and analysis of data collected during examination makes it possible, to a certain extent, to pinpoint the disturbance, perhaps even to give it a name. Functionally based changes in the larynx and vocal folds range in degree and kind from simple and temporary inflammation to permanent thickening of the folds, nodules, polyps, and contact ulcers. The information available on the three general classifications of functional voice

disorder most germane to the present study are summarized here for purposes of clarification. These classifications are acute hemorrages on the vocal folds, chronic non-specific laryngitis, and myasthenia laryngis.

Tiny submucosal hemmorhages on the vocal folds themselves may be due to sudden, violent, and excessively forceful approximation of the vocal folds. They are not necessarily confined to professional voice users and can be produced by shouting at sports events, screaming, energetic bouts of coughing, weight lifting, singing out of one's range, or speaking too loudly. The hemorrhages may be single or multiple; rarely is the whole vocal fold involved. Other symptoms include hoarseness (which comes on suddenly) and some kind of negative kinesthetic sensation.[117]

Chronic non-specific laryngitis may follow an acute attack, but more often it arises gradually. Simpson, Robin, Ballantyne, and Groves have provided a concise summary of its characteristics. They have described its causes as:

1) Faulty Use of the Voice--with overstraining or excessive force . . . the most important factor;

2) Infection in Teeth, Tonsils, and Sinuses--especially when accompanied by excessive hawking or coughing;

3) Excessive alcohol or tobacco; and

4) Dust or fumes.[118]

They have described its pathology as consisting of hyperemia of the mucous membrane covering the vocal folds, swelling of the vocal folds, and

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[117]John F. Simpson, Ian G. Robin, John C. Ballantyne, and John Groves, A Synopsis of Otolaryngology (Bristol: John Wright and Sons, Ltd., 1967), p. 358.

[118]Ibid., pp. 365-366.

excessive secretion of mucous by local glands. Hoarseness is described as the predominant symptom--intermittent at first and perhaps less marked after use of the voice. If a cough is present, it is slight, dry, and irritating, causing constant desire to clear the throat. Soreness in the throat is a frequent complaint.[119]

Myasthenia laryngis is a term proposed by Chevalier Jackson in 1940 to describe a vocal syndrome affecting professional voice users. Even though major pathology in the laryngeal area is absent, myasthenia laryngis is characterized by progressive weakening of the voice, a weakening which is due to improper speaking or singing habits. Most typically, tense phonation, the use of hard glottal attacks, and inefficient breathing produce a pattern of vocal overexertion which ultimately renders the intrinsic muscles of the vocal folds incapable of achieving efficient adduction. The examiner can observe the bowing of the weakened vocal folds and can hear the escape of unphonated air in the vocal tone.[120]

Prognosis.--There can be no really definitive line of demarcation between a slight voice disorder and a severe one. On one hand, the voices of most adults exhibit one or more of the hyperfunctions described by Froeschels (see p. 39). On the other hand, what appears to be a very serious problem to one individual will be ignored by another as being of absolutely no importance. Continued misuse of the voice or heavy use of

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[119]Ibid.

[120]Jackson and Jackson, Diseases of the Nose, Throat, and Ear, pp. 625-626.

the voice during a respiratory infection can lead the voice user, especially the professional who makes more stringent demands on his voice, to a progressive deterioration in the tonus of the laryngeal muscles which is, at the present state of medical knowledge, eventually irremedial. It is therefore extremely important to understand the nature of the prognosis in these cases.

If a professional voice user is in the early stages of functional misuse, prognosis is relatively hopeful. If, however, he is not seen by a physician until hypofunction has already set in, prognosis is far worse. Hypofunction may represent exhaustion of the vocal muscles after prolonged hyperfunctional use. It can therefore be considered a more severe form of voice disturbance and presents a poorer prognosis than does hyperfunction. The voice may already be damaged beyond repair. At best, long periods of retraining may be required before part or most of the vocal strength is regained.[121]

Voice Research of Particular Relevance to Actors and Other Public Performers

Actors and other public performers are particularly prone to the occurrence, the complications, and the consequences of functional voice disorders. With many voice professionals, the absence of vocal training or the presence of improper or inadequate vocal training and the constant and specialized vocal demands made on these individuals by the practice of

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[121]Brodnitz, Vocal Rehabilitation, p. 83. See also Chevalier Jackson and Chevalier L. Jackson, Diseases and Injuries of the Larynx (New York: Macmillan Company, 1942), pp. 39-40.

their professions have combined to make functional voice difficulties a very frequent occurrence.

Literature dealing with the specialized problems of acting, singing, and other types of public performance can be divided into two general areas. The first group concerns research on the characteristics of the voice in performance, whereas the second group deals with the effects of prolonged performance on the voice itself.

Lynch had two groups of readers record three selections--factual, angry, and grief-stricken. Her trained readers consisted of staff members in dramatic art, professional actors, and students experienced in dramatic work; her untrained readers were university freshmen having little or no experience in platform reading, speaking, or acting. She analyzed her readers' use of pitch, rate, and loudness in each reading, by using the phonophotographic apparatus described by Tiffin.[122] On the basis of her experiment, Lynch concluded:

> The trained readers used longer pauses between phrases for each passage, a much slower rate of speech within phrases for the third passage, a wider pitch range and greater pitch variation for all passages, a more marked tendency to set off significant words by using large inflections, and a significantly greater tendency to use more complex and fewer simple pitch inflections than did the subjects in the inexperienced group. The trained group in reading the emotional passages shortened the polysyllabic words and prolonged the pauses between phrases. Both groups raised the pitch level in the expression of emotion, the passage expressing anger exhibiting the greatest rise.[123]

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[122]J. Tiffin, "Phonophotographic Apparatus," University of Iowa Studies in the Psychology of Music, I (1932), pp. 118-133.

[123]Gladys E. Lynch, "A Phonophotographic Study of Trained and Untrained Voices Reading Factual and Dramatic Material," Archives of Speech, I (January, 1934), p. 24.

Cowan, in another experiment, made recordings of ten professional actors and actresses reading dramatic materials which they had selected themselves and found that dramatic speech is characterized by a wider pitch range and greater variability in both pitch and intensity than that reported for any other type of speech.[124] Goates was able to show in his study that the emotions portrayed by actors in rehearsal reflected themselves in greater and more inflections as they continued to develop their characterizations. In addition, Goates found that tonal range increases but that mean phonational range remains approximately the same during the rehearsal period, whereas the rate of speech increases during that time.[125]

Research dealing with voice projection by actors and other public performers has been extremely sparse and intermittent. Talley, in an experiment using actors, found that:

> . . . when a speaker changed from conversational to the audience type of speech, three changes in the sound wave produced by his voice took place simultaneously, namely heightened pitch, increased intensity, and a shift of energy from the lower to the higher partials. . . . it does not seem possible at present to evaluate the relative importance of the three factors nor to state whether one element causally influences the other two.[126]

It seems evident that an actor makes certain modifications in his voice in order to communicate with an audience. Part of an actor's skill involves his ability to communicate vocally the emotional states experienced by the character which he is portraying. Fairbanks and Pronovost

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[124]Cowan, "Pitch and Intensity Characteristics of Stage Speech," p. 82.

[125]Goates, "Pitch Changes in Actors," p. 49.

[126]C. Horton Talley, "A Comparison of Conversational and Audience Speech," Archives of Speech, II (July, 1937), 40.

concluded, on the basis of their experimental research in this area, that a group of listeners was able to identify quite consistently the emotional states of grief, anger, fear, contempt, and indifference when particular sentences were spoken by trained actors who were attempting to communicate these emotions.[127]

It is doubtful that the actor himself must experience an emotion in order to communicate it effectively to an audience. Even if he were to do so, the emotion is not experienced in its original form. And yet, both tension and emotional factors are quite capable of producing physiological changes in the individual which in turn affect his breathing and his voice. Moses has stated that whether these emotions are real or imagined is not important; both are quite capable of affecting the individual's breathing and the characteristics of his voice in the same manner.[128] Moses has also stated that this is precisely what happens in the good actor; he does not merely affect certain types of breathing, but actually experiences them by imagining certain emotions.[129]

The working actor must contend not only with the effects of his characters' emotional conflicts on his voice, but with the effects of his own emotions as well. Even experienced actors have suffered occasional first-night jitters or symptoms of stage fright during an important

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[127]Grant Fairbanks and W. Pronovost, "Vocal Pitch During Simulated Emotion," Science, LXXXVIII (1938), 382-383.

[128]Moses, The Voice of Neurosis, p. 32. See also Paul J. Moses, "The Vocal Expression of Emotional Disturbances," Kaiser Foundation Medical Bulletin, VII (April-June, 1959), 109; and Moses, The Voice of Neurosis, p. 82.

[129]Moses, The Voice of Neurosis, p. 32.

audition. The observable characteristics of stage fright have been discussed by Clevenger and King.[130] As many as eighteen different visible symptoms, falling into one of three categories (figitiness, inhibition, and autonomia), may appear during stage fright, according to their study. Even though a number of researchers have found that increased performance experience tends to lessen or eliminate stage fright,[131] Lomas found that the physiological effects of stage fright on the performer are extremely similar to the effects of other emotional states.[132] Given both the pressure-saturated environment in which he works and the need to externalize strong character emotions onstage, it is not at all difficult to see why actors are so susceptible to tension in general and to the occurrence of functional voice problems in particular. In those who use the voice professionally, the vocal organs are unfortunately the most logical and most typical place for the transformation of emotional tension into disturbances of function.

> The vocal mechanism may be healthy and undamaged, but the precision with which it responds to the subtle and intricate demands made upon it is so often affected by the state of mind and emotions of the performer. . . . Tranquility and confidence, anxiety set-aside, yet sensitivity to the emotions of the dramatic situation and of the participating audience, should be the player's aim. But this ideal

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[130]Theodore Clevenger, Jr., and Thomas R. King, "A Factor Analysis of the Visible Symptoms of Stage Fright," Speech Monographs, XXVIII (November, 1961), 296-298. See also Theodore Clevenger, Jr., "A Synthesis of Experimental Research in Stage Fright," Quarterly Journal of Speech, XLV (April, 1959), 134-145; and Floyd Greenleaf, "An Exploratory Study of Speech Fright," Quarterly Journal of Speech, XXXVIII (October, 1952), 326-330.

[131]See, for example, Gordon M. Low and Boyd V. Sheets, "The Relation of Psychometric Factors to Stage Fright," Speech Monographs, XVIII (November, 1951), 266-271.

[132]Charles W. Lomas, "The Psychology of Stage Fright," Quarterly Journal of Speech, XXIII (February, 1937), 35-45.

> is rarely achieved, and such failure is often a large factor in the singer or actor not making the most effective use of his voice. On occasions it may be the only cause of disaster, but in any dysfunction, or even disease of the throat, this emotional factor may be of importance. . . .[133]

Thus, vocal strain occurs most frequently in those whose professions make the most stringent demands upon their voices. For such professionals, dysphonia is therefore an occupational hazard--unless their voices have been well trained or unless they happen to have exceptionally placid natures.[134] Such individuals are extremely few in number when it comes to the acting profession; actors and singers are known to be sensitive, excitable people, easily influenced by both emotions and environment.[135]

To these emotional factors must be added a number of technical problems, such as the acoustics of particular theatres or the mastery of microphone techniques. The speaker or singer who must produce a carrying voice may be trapped into the use of too much force by proprioceptive reflexes:

> In singing and speaking, sensations of tension and vibration play an important part in controlling vocal functions. This proprioceptive control may become a source of hyperfunction. The speaker or singer who tenses his muscles to produce a loud voice perceives a high degree of vibratory sensation: his voice "feels" loud like a cheap violin that creates a large amount of vibrating noise for the ear of the player but does not carry the sound far, as a good instrument does.
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> The greater the muscular constriction, the more powerful the voice seems to become to the singer or speaker. A vicious circle develops with hyperfunction feeding on hyperfunction.[136]

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[133]Punt, The Singer's and Actor's Throat, p. 3.

[134]Greene, The Voice and Its Disorders, pp. 92-93.

[135]Punt, The Singer's and Actor's Throat, pp. 1-2. See also Brodnitz, Vocal Rehabilitation, p. 48.

[136]Brodnitz, Vocal Rehabilitation, p. 48. See also Lessac, The Use and Training of the Human Voice, p. 222.

As previously discussed, if the voice is correctly produced by the speaker, sheer amount of use will not cause functional voice disturbance (see pp. 35-36). The task of the actor, then, is to imitate or recreate life in all its complexity, using tremendous flexibility and adaptability of the voice to various performing situations and projecting effectively (i.e. communicating with his audience without changing or distorting the type of speech the play requires) without damaging his own vocal mechanism in the process. It is almost needless to point out how few are successful in this extremely demanding undertaking. Those who are not totally successful must pay the price, which too often comes in the form of functional voice disturbance. The actor who lacks vocal training or whose vocal training has been deficient will not know how to add volume to the voice without muscular effort, bodily tension, or use of too much air. It is just a matter of time before negative patterns become habituated and begin the functional syndrome.[137]

Even when the voice is generally well focussed and not often abused, the question of how much performance it can take should be considered. Yet, not only hasn't this question been completely resolved, but many performers have also ignored the advice which has been offered by voice specialists. Levin has stated that when performance requires about one hour of specialized voice usage, the artist should appear no more often than twice weekly, and needs a twenty-four hour rest period before and

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[137]Emil Fröschels and A. Jellinek, Practice of Voice and Speech Therapy (Boston: Expression Co., 1941), p. 194. See also West and Ansberry, Rehabilitation of Speech, p. 216.

after such a performance. Smaller parts, in his opinion, could allow daily performance, or even performance twice daily four days a week.[138]

Even if we consider Levin's advice a bit conservative, the fact remains that many actors and singers are guilty of either overworking their voices or continuing to work even when a respiratory infection is present. If the voice is not rested during these critical times, it may physically fatigue.[139] In an attempt to overcome the resulting weakness, the performer will further strain the already tired muscles. Soon he will begin to worry about his voice difficulties and the resulting anxiety will also complicate the functional syndrome. The vicious cycle thus established can disturb even the best vocal technique. Faulty habits then replace good ones and the vocal organs can incur damage. If such damage is not treated via rest and retraining, it can become permanent.

> Of those who start out with an ambition for a great career in vocal music probably more than 95 per cent never attain it; and most of the promising vocalists who fail do so because of myasthenia laryngis. The laryngeal muscles, especially the thyro-arytenodei, cannot stand the strain of the years and years of grueling daily practice necessary to reach the top in operatic and concert work. . . . To make matters worse most singers talk all the time when they are not singing in performance or practice. The laryngeal muscles get no rest. Additionally, all sopranos and tenors are under incessant pressure all their professional lives to increase their vocal range upward in pitch. The strain on the thyro-arytenoidei is extremely severe and in most instances ruinous. Faulty methods, as all vocal teachers know, are sometimes partly to blame; but few human larynges can stand the strain of constant severe work and no rest. Another causative factor is forced use of the larynx in performance and practice while the larynx is acutely inflamed. . . . <u>This is one of the worst forms of injury anyone can inflect on his larynx</u>. [Italics mine.][140]

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[138]Nathaniel M. Levin, "The Professional Singer," <u>Voice and Speech Disorders--Medical Aspects</u>, ed. by Nathaniel M. Levin (Springfield, Illinois: Charles C. Thomas, 1962), p. 484.

[139]Brodnitz, <u>Keep Your Voice Healthy</u>, p. 157.

[140]Jackson and Jackson, <u>Diseases of the Nose, Throat, and Ear</u>, p. 625.

Fortunately, the work of most actors is not as vocally demanding as is the training of legitimate singers. Nevertheless, many of the principles are exactly the same. Furthermore, severe functional problems in the singing voice will eventually affect the speaking voice as well.

Summary.--Actors and other public performers are particularly prone to the occurrence, the complications, and the consequences of functional voice disorders. The special problems of public performers have been discussed in research on the characteristics of the voice in performance and research on the effects of prolonged performance on the voice itself.

Research has indicated that actors alter their vocal characteristics when communicating specific emotions or when projecting their voices. Research has also indicated that listeners are able to identify specific emotions when listening to readings by trained actors. Both the emotions which the actor portrays and those which he contributes himself during a performance influence his breathing patterns and the characteristics of his voice. Because of the pressure-saturated environment in which he works and the strong character emotions which he portrays, actors are particularly susceptible to tension in general and to the occurrence of functional voice problems in particular. In addition, problems of acoustics and projection may force actors into patterns of hyperfunction during performance. Furthermore, overworking the tired voice and working during respiratory infection are particularly dangerous for actors and other public performers.

A growing number of theatre, music, speech, and medical specialists have been pleading for far more extensive voice training for actors,

singers, public speakers, and clinicians. This is not the proper place for a discussion of the merits of such training or for a discussion of the relative worth of various systems presently taught in this country. However, these issues are of tremendous and immediate importance to the future of voice training in America and are in desperate need of qualified attention and investigation.

An Overview of the Literature

An examination of the literature available in speech pathology, laryngeal medicine, psychology, music, and theatre has revealed both a basis for research into the actor's voice problems and a number of gaps in existing research. Available materials have been classified under four main areas: 1) research on the characteristics of the normal speaking voice; 2) research on the effects of emotions and personality on the voice; 3) research on the etiology, diagnosis, and characteristics of functional voice disorders; and, 4) voice research of particular relevance to actors and other public performers.

This review of the literature has revealed that the normal voice (in the sense of optimum) is far less frequent in contemporary America than is the functionally disordered voice. For the most part, the normal voice is found only in pre-school children or as the result of hygienic training.

The normal voice (in the sense of average) has been found to exhibit certain typical characteristics. The adult male voice has been found to have a pitch of 130 cycles per second, a range of about one and one-half octaves, and a rate of about 160 words per minute. Loudness and quality

in normal voices have not been studied as extensively because of problems of definition and methodology, problems which have yet to be solved. The majority of researchers have agreed, however, that any type of breathing with the exception of clavicular breathing is equally effective in producing good voice quality.

Research has revealed an intimate relationship between the emotions and the voice. Rate, depth, and regularity of breathing, for example, are related to emotional states. Similarly, pitch, range, loudness, rate, and quality have been found to be dependent on emotional factors.

Emotional factors constitute but one type of contributor to the etiology of functional voice disorders. Other contributing factors include improper or excessive use of the speaking or singing voice (in terms of breathing, force, and pitch), use of the voice during respiratory infection, simple overwork, the inhalation of cigarette smoke and other laryngeal irritants, and lack of good vocal training in professional voice users.

When a functional voice problem does occur, its symptoms may be seen, heard, or felt. Such symptoms vary in number, in kind, in severity, and in combination. They include: clavicular breathing; observable tension; non-productive throat clearing; pitch and quality aberration; range restriction; increasing difficulty under extended voice usage; various negative kinesthetic sensations; inability to tolerate an indirect laryngoscopic examination; inflammation, edema, hemmorhage, and discoloration of the vocal folds and pharynx; and observable functional abuse during phonation. The most reliable diagnoses are based on the comparison of results obtained in examination during times of health with those

obtained in time of complaint. Prognosis is more positive in cases of functional hyperfunction than in cases of functional hypofunction.

Actors and other public performers are particularly prone to the occurrence, the complications, and the consequences of functional voice disorders. The need for projection and other specialized use of the voice, the pressures of the working environment, and even the influence of character emotions have made dysphonia almost an occupational hazard.

Training and preparation for professional work must be greatly improved and intensified before voice users can regard a durable and flexible voice as an asset rather than regarding an unreliable and susceptible voice as a necessary occupational liability.

CHAPTER III

METHODOLOGY

To facilitate an understanding of the methodology employed for this descriptive study, Chapter III has been divided into three parts. The first part discusses the overall design of the study. The second part discusses in greater detail the processes by which the data for the study were collected. The third part deals with the manner by which the collected data were processed and analyzed.

Design of the Study

During the spring quarter, 1969, at Michigan State University, a descriptive study was conducted in order to answer the following questions: 1) Is it possible to determine quantitatively and qualitatively in what respects and to what extent an actor alters his vocal characteristics for purposes of performing publically or creating a particular characterization? 2) What effects (if any) do such induced voice alterations and the size of the role portrayed have on the physical condition of the actor's vocal mechanism and on the characteristics of his own voice? 3) Is there a discernible relationship between or among any of the following: previous vocal training; previous acting experience; the demands of a particular characterization; and the presence, the nature,

and the severity of any objectively measurable voice problems or symptoms of problems occurring during the course of the preparation and production of a full-length show? The first task was to locate a suitable production around which the study could be organized.

Selecting a Production.--Because there had not been a significant number of studies dealing with the actor's voice, there was no reliable set of criteria already established to determine the choice of a suitable production. In Goates' study of the pitch changes experienced by actors during rehearsal, he stated only that he made his choice of play because "It was felt that this play and the passages it provided were sufficiently established in typicalness, and dramatic and literary value."[1] Since such guidelines provided far less structure than was considered necessary for the study being planned, more specific criteria had to be established for the selection of a suitable production.

After considerable thought and meetings with faculty members in both the Department of Theatre and the Department of Audiology and Speech Sciences at Michigan State University, a list of criteria for choosing a suitable production was finally evolved. In order to ascertain the effects of a particular vocal and physical characterization upon the laryngeal condition and vocal characteristics of a number of actors, a production had to be found which met the following criteria:

1) the play had to provide an adequate number and appropriate type of roles for at least three major actors who would comprise the experimental group, and at least three minor actors who would comprise the control group;

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[1]Goates, "Pitch Changes in Actors," p. 1.

2) the play had to be done in a production whose cast members were likely to include both experienced or vocally trained actors and novice actors appearing in one of their first productions;

3) the play had to be of sufficient length to challenge a number of actors' vocal and physical capabilities;

4) the play had to include a number of passages of sufficient length and typicalness to serve as suitable material for recording various actors' voices in character; and

5) the play in production had to have a director willing to allow the experimenter to observe and take notes at all rehearsals and willing to consult with her whenever necessary regarding certain facets of the work.

The decision regarding the number of subjects for this study was made after a consideration of three relevant facts: 1) Because of a lack of established methodology for a study such as this one, the greater value would be achieved by emphasizing the evaluation of its methodology rather than by involving a large number of subjects. 2) The amount of data being collected for each subject was quite substantial; involvement of more than six or eight subjects would be of little practical value. 3) The few other studies which might be used as a guide for this one had few subjects: the Cowan study[2] was made using ten actors, and the Brackett study[3] used only three.

After preliminary research and consultation with the chairman of the Department of Theatre and the director of the play, the 1969 Michigan State University Performing Arts Company production of Peter Weiss' The Persecution and Assassination of Jean-Paul Marat as Performed by the

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[2]Cowan, "Pitch, Intensity and Rhythmic Movement."

[3]Brackett, "Easy and Harsh Production of the Voice," p. 3.

Inmates of the Asylum of Charenton Under the Direction of the Marquis de Sade,[4] directed by Dr. Sidney Berger, was selected for this study. An examination of both the script itself and the play's previous production record immediately illustrated how well suited this production was to all the criteria.

The script calls for a large number of male actors in both major and minor roles. In addition to the six speaking roles of the Marquis de Sade, Jean-Paul Marat, Duperret, Jacques Roux, the Herald, and Coulmier, the script calls for a variable number of asylum inmates, male nurses, singers, and musicians. The production at Michigan State University was to be cast from members of its Performing Arts company and from the graduate and undergraduate student body, insuring a good combination of both experienced and inexperienced actors.[5] The play is a contemporary full-length work. Its script contains a number of passages of sufficient length and typicalness to serve as suitable material for recording various actors' voices as they read in character.[6] The play's

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[4]Hereinafter referred to as Marat/Sade.

[5]During the year in which this study was done, the Performing Arts Company at Michigan State University was made up of 25 M.A. and Ph.D. students in theatre, ten of whom were actors and therefore required to audition for Marat/Sade. The Performing Arts Company actors were graduate assistants, paid stipends by the University for acting in its productions; they were accepted into the company on the basis of audition, resumés, and letters of recommendation. The vast majority of company members had at least a few years of acting experience and training.

[6]Sufficient passage length was established as the minimum number of words common to the passages read by all subjects. The shortest of the three longest passages spoken by all of the inmates was thirty words in length. Establishing this as the minimum therefore guaranteed an equivalent sample for the purposes of data analysis. Passages were considered typical if both their content and their style conformed generally to overall demands of a particular characterization.

artistic merit had already been established by the critical reception to both its 1965 Peter Brook-Royal Shakespeare Company production in England and its subsequent limited Broadway engagement at the beginning of 1966.[7]

As the unabbreviated form of the title indicates, the play written by Peter Weiss is an enactment of the persecution and assassination of Jean-Paul Marat, a literary figure during the French Revolution, as performed by the inmates of the asylum of Charenton under the direction of the Marquis de Sade. The characters in de Sade's play within a play are portrayed by individuals incarcerated in the asylum because they were believed to be insane or politically unsafe. The inmate playing Jean-Paul Marat is described in the script itself as a paranoiac, and Duperret is described as an erotomaniac. In addition, each of the twenty to thirty or more inmates who serve as chorus and minor characters in the production were portrayed as in some way mentally unstable.

Furthermore, the actual demands of the play's plot and physical staging made their demands on the actors' capabilities. All the characters, for example, are required by the script to come onstage at the play's opening and to remain there throughout the course of the production; actors could get out of character and relax only during one brief intermission between the two acts. In addition, the play itself consists of a procession of theatrical digressions;[8] there is constant activity

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[7]Marat/Sade won both the New York Drama Critics' Circle Award and the Tony award during the 1965-66 New York theatre season. See New York Times, May 27, 1966, p. 33 column 5, and June 17, 1966, p. 37 column 1 for the announcements of these awards.

[8]Henry Hewes, "Broadway Postscript: The Weiss/Brook," Saturday Review, January 15, 1966, p. 45.

onstage, and the level of that activity is consistently high throughout the play.[9] There seemed little doubt that such a production was more than likely to prove a good test of the actors' vocal and physical capabilities. Finally (but of utmost importance in terms of the original criteria), the production's director was not only willing but also very interested in working on the present study.

Selection of Subjects.--Before the play was cast, the researcher met with the play's director in order to select the subjects for this study. As previously stated, six subjects were considered the minimum number needed to comprise an experimental group and a control group (see page 78); eight subjects were selected in case any of them had to drop out of the study during the course of the data collection.[10] The study required the participation of the four actors playing the most vocally demanding roles in the play and four actors playing very minor roles as inmates who had little or no previous acting experience or training. The four most vocally demanding roles were determined on the basis of an examination of: 1) the length of the roles in number of lines; 2) the playwright's description of some of the characters from the script and stage directions; and 3) the director's conception of how he wanted these characters portrayed by the actors he would cast. The four major roles thus selected were Jean-Paul Marat, the Marquis de Sade, Duperret, and

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[9]Robert Brustein, "Embarrassment of Riches," New Republic, January 22, 1966, p. 26.

[10]Such was not the case; consequently, results are reported in Chapter IV of this study for all eight subjects.

Jacques Roux. Four actors cast in minor roles as asylum inmates were selected when the cast list was posted. Their selection was based on their lack of extensive previous acting experience or voice training.

Overview of Experimental Procedure.--The general shape of the experiment was based very loosely on two previous studies of actors' voices during the production of a play and more specifically on standard procedure in the examination of voice patients by laryngologists and speech pathologists. When Goates did his study of pitch changes in actors during rehearsal, he began collecting data as soon as a cast was selected and before any rehearsal had begun. He made phonograph records on a number of occasions during the rehearsal period, instructing his actors to read the selections from the play "in the same manner as they did in regular rehearsals."[11] In another study, Marie Park kept a daily log of the directions given and the responses made by each player in a production during rehearsal. She obtained data concerning each player's previous training in speech and dramatic art by means of a questionnaire used in connection with an individual conference.[12] These methodological ingredients provided a general framework for the present study.

The present study was designed to ascertain what changes the actor induces in his voice for purposes of characterization; the effects of such changes on the characteristics of his own voice; and the relationship

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[11]Goates, "Pitch Changes in Actors," p. 3.

[12]Marie Park, "Diagnostic Study of Development in Rehearsal and Performance of Students in Dramatic Interpretation" (unpublished Ph.D. dissertation, State University of Iowa, 1938), pp. 1-2.

among his previous training and experience, the demands of his particular role, and the occurrence of any functional voice problems as a result of his characterization. In order to accomplish these tasks, the present study was constructed around a series of interviews held at the beginning of rehearsals, during the week of production, and following the close of Marat/Sade.

The researcher met with each subject being studied on three occasions, for one to two hours at a time. The first set of interviews and examinations took place during the first week of rehearsal, while the production was being blocked. At the interviews, an extensive history was taken in order to ascertain the condition of each subject as he entered into the study. Furthermore, data were obtained which would be used to assess degree of relaxation, habitual breathing patterns, and vocal characteristics of each subject. Following the interview, each actor was sent to a consulting medical laryngologist, whose examination determined the condition of the throat and larynx. All interviews were held in the same quiet and soundtreated room, and all recordings were made using the same equipment. As far as possible, the time of day which had been established for the first set of interviews was adhered to for the second and the third interviews as well. In this way, variables relating to both vocal behavior and equipment fidelity were controlled.

The second set of interviews and examinations was held during the week in which the show was in production, having been in rehearsal for the four previous weeks. These interviews and examinations also consisted of the taking of pertinent history by the examiner; the collection of data to be used for an analysis of degree of relaxation, habitual

breathing patterns and vocal characteristics; and an indirect laryngoscopic examination.

The third set of interviews and examinations took place two weeks after the show had closed, and most of the same tests were repeated in order to determine whether the absence of rehearsal and performance demands on the voice would result in any physical or vocal change in the subjects.

In addition, all rehearsals of Marat/Sade were observed, and a production log was compiled. Entries included every director's comment to the subjects relating to the use of voice in the production. Symptomology of functional voice problems which could be observed during the course of the rehearsal period were also recorded in the log, for purposes of pinpointing the time of their occurrence in relation to production demands. By keeping such a daily record, the researcher was not totally dependent on the subjects' memories of vocal problems encountered between scheduled interviews.

The data collected at all interviews were processed and analyzed with the assistance of the Instructional Media Center at Michigan State University and two voice specialists in the Department of Audiology and Speech Sciences.

Collection of Data

Decisions regarding what data would be collected and in what manner were based on both general and specific suggestions found in the literature. The general approach was based on the diagnostic outline suggested by Moore. The four steps he listed as a basis for diagnostic

procedure included the analysis of vocal characteristics, the obtaining of relevant history, the physical examination of all related structures, and the evaluation of contributing nonspeech skills and abilities.[13] More specifically, data were obtained through use of the two essential types of diagnostic tools described by Darley: the test and the history.[14] Darley has described the test as a presentation of any stimulus to a subject for the purpose of eliciting some sample of behavior. Such a sample may range from a simple prolonged vowel to an unstructured discussion by the subject of some stimulus material. Darley has described the history as the provision of essential information about a great number of factors related to the problem being studied. The use of these definitions provided a general foundation for the methodology used in this study, upon which a number of specific techniques were based for the actual data collection.

Case History.--At every interview, information was elicited from each subject on the basis of its relevance, sufficiency, representativeness, and reliability.[15] The case history was administered orally by the researcher to each subject. It consisted of a list of questions, both specific and general, designed to obtain information about family history, medical history, education and training, acting experience, and vocal

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[13]G. Paul Moore, "Voice Disorders Organically Based," p. 553.

[14]Darley, Diagnosis and Appraisal of Communication Disorders, pp. 5, 7.

[15]Wendell Johnson, F. L. Darley, and D. C. Spriestersbach, Diagnostic Methods in Speech Pathology (New York: Harper and Row, 1963), p. 26.

development and problems. The questionnaire completed by the researcher during this interview was adapted from the standard case history outlines described by Van Riper[16] and from the Luchsinger and Arnold outline for a phoniatric examination report.[17]

These outlines were amended in order to meet the needs of this particular study. For example, questions were incorporated regarding type and duration of vocal training. As was suggested by Luchsinger and Arnold, subjects were asked to describe specific training methods, attempts to expand the natural range of the voice, and their teacher's preferences for open or covered tone.[18] Each subject was also asked to describe any physical or vocal warm-up techniques he employed during rehearsals or before performances.[19] A copy of the case history questionnaire used in this study can be found in Appendix A-I.

Although the use of the case history is standard procedure in voice diagnosis, there are some important factors which should be considered regarding the use of this technique. Case history does provide a detailed account of the familial, medical, educational, and vocal history of an individual. When administered orally, it also provides the subject with an opportunity to relax and just talk with the diagnostician. At the same time, it permits the diagnostician to listen to the subject's

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[16]Van Riper, Speech Correction: Principles and Methods (4th ed.,), pp. 492ff.

[17]Luchsinger and Arnold, Voice--Speech--Language, pp. 163-164.

[18]Ibid., p. 309.

[19]Dorothy Sherman and Paul Jensen, "Harshness and Oral-Reading Time," Journal of Speech and Hearing Disorders, XXVII (1962), 176.

voice without the subject realizing he is in any kind of a test situation. However, the necessity for relying on a subject's memory at the time of a particular interview can be a limiting factor. For example, a subject may simply forget the fact that he lost his voice completely for two days when he was fourteen--or he may decide for some reason to conceal this fact from the diagnostician.

Such difficulties may be avoided or circumvented in some cases in at least two ways. Firstly, the diagnostician can question not only the subject, but members of his family or co-workers as well. They may provide important facts which the subject has omitted or shed further light on the information which he has provided. When necessary and practical, the diagnostician may also consult medical and educational records for confirmation or clarification of facts. Secondly, if a certain amount of repetition is actually built into the case history questionnaire, a subject may remember information the second time he is questioned on a particular subject, information which he had omitted the first time around.

In using a case history questionnaire, and especially when administering it orally, the diagnostician must also be careful not to word any question in such a way as to indicate to a subject an answer he anticipates or desires. If these cautions are kept in mind, the use of the case history questionnaire is a very valuable diagnostic technique for the voice researcher.

Spectator Observation.--Johnson, Darley, and Spriestersbach have effectively discussed the value of spectator observation in the diagnostic

interview.[20] A trained and disciplined examiner can learn much about a subject's habitual level of tension or relaxation and his pattern of breathing by observing his behavior during the diagnostic interview. Tension in the throat and neck can be seen as well as heard. The strap muscles of the neck may be contracted and the larynx may be held in an elevated position. The subject may habitually hold his head in what seems to be a tight or awkward position or may sit with his hands fidgeting or tightly gripping the arms of his chair throughout an interview. Observation and notation of such occurrences provide valuable information. On the other hand, the absence of tension in the muscles involved in voice production can be taken as an indication that these muscles are being used efficiently and are in their most natural positions.[21]

At various times during each interview, the physical state of each subject was observed for signs of tension or relaxation. Although such observation necessitated subjective value judgment (see Appendix A-IV), the use of the same observer for all subjects at all interviews and the use of a checklist by that observer helped to minimize fluctuations which might be attributed to sheer chance. During each interview, the researcher also performed the very simple "test" described by Jacobson to evaluate state of tension.[22] The subject's hand was raised up off the arm of the chair on which it was resting and his reaction was observed.

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[20]Johnson, Darley, and Spriestersbach, Diagnostic Methods in Speech Pathology, pp. 24-25.

[21]Greene, The Voice and Its Disorders, pp. 65-66.

[22]Edmund Jacobson, Progressive Relaxation (Chicago: Chicago University Press, 1938).

The subject was then asked to relax completely, and the same procedure was repeated. A notation was made each time of whether the arm remained up, was forced down, or fell of its own accord after its release. Of course, a decision as to whether a voice difficulty is of psychogenic or physiogenic origin is not directly aided by observing whether the patient can relax his arm voluntarily, but "certain valuable negative inferences may be drawn that will throw light on findings otherwise arrived at."[23]

The pattern of respiration used by each subject during rest, when speaking or reading, and when reading in character from a script of Marat/Sade was also observed. A number of leading clinicians highly recommend this practice, although they have observed that too few diagnosticians regularly employ it.[24] Respiratory patterns can usually be observed sufficiently during other activities comprising the diagnostic interview, and without the use of any complicated machinery. Accordingly, while the subjects were engaged in various activities related to the collection of recorded vocal data, their respiratory activities were observed at a number of scheduled opportunities. Location of major muscular activity during inhalation was notated as either central (located in the vicinity of the diaphragm or rib cage) or clavicular (located in the vicinity of the upper chest or shoulders). Finally, in order to ascertain breathing efficiency, the researcher observed and made note of the number of breaths which were taken by each subject during his reading of a uniform selection. This procedure was based on Van Riper's procedure for

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[23]West and Ansberry, Rehabilitation of Speech, p. 248.

[24]Murphy, Functional Voice Disorders, p. 97. See also Brodnitz, Vocal Rehabilitation, pp. 12-13.

assessing breath economy during speech.[25] On a text of the selection being read, a slash mark was entered for each inhalation taken by the subject during his reading, and the total number was calculated.

To summarize, data was obtained at each interview using the method of spectator observation. An assessment was made of the subject's visible level of tension when at rest, when speaking, and when reading in character. In addition, an assessment was made of the subject's type and efficiency of breathing under these circumstances. The checklist used for the notation of these observations can be found in Appendix A-IV.

Use of the Tape Recorder.--In order to make both the gathering and the subsequent analysis of data as objective as possible, it is standard procedure among speech clinicians and voice researchers to tape record their subjects' voices. This enables them to play back a voice tape as many times as necessary under optimum conditions for purposes of analysis and reliable evaluation. For purposes of diagnosis, the recorded materials should include samples of both conversational speech and reading. In addition, a sample of the voice under conditions of professional use is quite valuable to effective diagnosis.[26]

In the present study, most of the data obtained for each subject was tape recorded for purposes of future examination and analysis. All recordings were made by the researcher herself on an Ampex 601 monaural

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[25]Van Riper, Speech Correction: Principles and Methods (4th ed.), p. 469.

[26]Brodnitz, Vocal Rehabilitation, pp. 43, 69-70.

tape recorder in the same private, soundtreated room.[27] A table omnidirectional microphone with a cover filter was used; the subjects were instructed to maintain a distance of approximately twelve inches between themselves and this microphone as much of the time as possible. Based on Lunday's procedure in her study of the vocal quality and pitch of voices suspected of laryngeal pathology, the microphone was adjusted with the help of a VU meter in order to make volume the same for all the subjects.[28] Such adjustment made the assessment of habitual pitch more accurate (see p. 20) and facilitated quality evaluation by eliminating an unnecessary vocal variable.

In this manner, recordings were made of each subject reading, speaking conversationally, performing a number of vocal tasks, and reading in character from a script of Marat/Sade.

Description of Materials Recorded.--In recording materials for subsequent analysis, the researcher was basically interested in collecting data which would permit the assessment of:

1) the habitual pitch of the speaking and reading voice;

2) the rate habitually employed by the subject when reading aloud;

3) the range of the speaking or singing voice;

4) the quality of the voice; and

5) the use of hard glottal attack.

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[27]All recordings were made on Scotch brand #203 magnetic recording tape at a speed of 7½ I.P.S.

[28]Audrey Anne Mostoller Lunday, "The Vocal Quality and Pitch of Voices Suspected of Laryngeal Pathology" (unpublished Ph.D. dissertation, Ohio State University, 1967), p. 33.

In addition, materials were needed from which habitual pitch and rate, voice quality, and use of hard glottal attack when the actors read in character could be assessed. The need for such a quantity of data necessitated the recording of materials which could serve for more than one objective measurement whenever possible.

After the history had been completed, each subject was asked to read aloud a uniform passage selected from the Grasham and Gooder text, Improving Your Speech.[29] Before the recording was made, the subject was instructed to read the passage to himself and to ask about any pronunciations with which he was unfamiliar. Each subject read the passage twice; only the second reading in each case was used in the subsequent analyses and evaluations. The Grasham and Gooder reading was used to ascertain habitual pitch for reading, reading rate, use of hard glottal attack, breathing efficiency, and voice quality.

Each subject was then asked to read the Grasham and Gooder passage a third and fourth time. These times, however, he was asked to read the passage while slowly diminishing his vocal inflections until he was actually chanting the selection on a monotone. This procedure has been described in the literature as another effective means of determining habitual pitch for reading.[30] Only each subject's second reading while reducing inflection to a monotone was used to determine his habitual pitch for reading.

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[29]John A. Grasham and G. G. Gooder, Improving Your Speech (New York: Harcourt, Brace and World, Inc., 1960), pp. 8-9. The text of this selection can be found in Appendix B-I.

[30]Eisenson, The Improvement of Voice and Diction, pp. 91-92. See also Pronovost, "Natural and Habitual Pitch," p. 123.

In order to evaluate habitual use of pitch during spontaneous speech, two samples of each subject's conversation were obtained. The subjects were told that a sample of their speech was needed for this study and were asked to discuss various subjects related to either their personal interests or to their participation in Marat/Sade. If a subject was not particularly talkative about these topics, the researcher interjected a short comment or question to insure that the resulting speech sample was at least two minutes in length; if a subject was taking up too much taping time, the investigator interrupted to stop him.

Next, each subject was asked to speak while diminishing his inflection to a monotone. If the subject became wrapped up in his topic and forgot his task, he was provided with visual cues to remind him to reduce inflection to a monotone as he spoke, The speech samples thus obtained were used to ascertain habitual pitch for speech.

Each subject was then asked to read from the script of Marat/Sade in character. Goates stated, in his study of pitch changes in actors:

> The passages for study were selected in cooperation with the Associate Director of the University Theatre and director of the play. They were selected as being: (a) most nearly representative of the role portrayed by the actor, (b) as most likely to tax his abilities, (c) as offering adequate possibilities for acting, (d) as being located sufficiently within the play and scene as to find the actor completely "in character" at that point. . . , (f) as being long enough to provide an adequate sample.[31]

With these criteria in mind, the researcher and the play's director selected three passages for each of the eight subjects to read. For the four actors playing major roles in the play, the passages were taken from their speeches at different points in the play. For the four actors

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[31]Goates, "Pitch Changes in Actors," p. 2.

playing minor roles as inmates, the passages were uniform, and taken from places in the script where the inmates were speaking alone or in chorus.[32] The recordings of each actor reading from the script in character were used to ascertain habitual pitch and rate; the location of major breathing activity; breathing efficiency; the use of hard glottal attack; and the voice quality during characterization.

Next, each subject was asked to sing down the musical scale to the lowest note which could be clearly phonated and then up to his highest note including falsetto.[33] There is good reason for obtaining such a measure of maximum pitch range: the extent to which the vocal mechanism does not or cannot produce a given range may be the first indication of functional aberration.[34]

A few of the subjects had a bit of difficulty providing the necessary data for range analysis. Because they lacked musical training and/or had a poor pitch discrimination ability, a few had some difficulty either locating their lowest and highest notes or moving up the scale in an orderly fashion. However, the experimenter found that by singing along with some, visually cueing others, requesting one subject to imitate a siren, and repeating the test a few times, the necessary data could be obtained in all cases. The data obtained in this manner was used to determine the range of each subject's voice and to calculate his optimum pitch.

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[32]The texts of the selections read for this study can be found in Appendix B-II.

[33]Darley, Diagnosis and Appraisal of Communication Disorders, p. 52.

[34]Michel and Wendahl, "Correlates of Voice Production," p. 470.

The last task performed by each subject for purposes of recording involved maximum duration of phonation. The measurement of length of maximum phonation is a standard test for the evaluation of voice; changes in this measurement have often been observed in association with functional voice disorders.[35] Maximum duration of phonation is defined as the maximum amount of time for which an individual can sustain phonation on the breath of one deep inhalation. Although this seems like a very simple measurement to take, variables which can affect results obtained include pitch, loudness, vowel identity, physical condition of the subject, and voice training.[36] For this study, conditions were structured in such a way as to control as many of these variables as possible. Each subject was instructed to breathe deeply a few times and then to exhale an ah sound for as long as possible on a pitch about four or five tones up from the lowest he could comfortably phonate. The loudness of the tone was regulated by having each subject watch the VU meter on the tape recorder as he phonated his sound. The test was repeated twice, so that the longer of the two attempts could be recorded as the maximum.

Having completed this phase of the diagnostic interview, each subject was sent to the office of a consulting medical laryngologist on campus to undergo an indirect laryngoscopic examination.

Indirect Laryngoscopic Examinations.--In order to determine what relationship existed between other symptoms of functional voice problems and

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[35]N. Yanagihara and H. von Leden, "Respiration and Phonation," Folia Phoniatrica, XIX (1967), 153.

[36]Michel and Wendahl, "Correlates of Voice Production," pp. 470-471.

the presence of any visible laryngeal alterations, a consulting laryngologist examined each subject after each interview. The procedure for this examination, as described by Levin,[37] is a standard one in voice diagnosis.

As previously discussed in the survey of the literature, difficulty encountered by the examining physician in viewing a subject's vocal cords may be an immediate indication of functional difficulties (see pp. 52-3). When the laryngologist succeeds in viewing the subject's oral cavity, throat, and larynx, he is concerned with an observation of both appearance and function of the vocal mechanism. He observes the condition of the oral cavity and throat in terms of color, texture, and lubrication. He seeks a total impression of the size, the shape, and the symmetry of the larynx; a sense of its position in the throat; and an assessment of its activity during phonation. The vocal folds are examined for color, shape, position, and symmetry. The patient is customarily asked to phonate so that the laryngologist may also observe adduction, glottal attack, vibration, and the responsiveness of the intrinsic laryngeal musculature. The movable parts of the larynx should be capable of both coarse and fine adjustments during phonation. The muscles regulating vocal fold tension, shape and adduction should be able to adjust both subtly and precisely during phonation.[38]

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[37]Nathaniel M. Levin, "Benign and Malignant Lesions of the Larynx," in Voice and Speech Disorders: Medical Aspects, ed. by Nathaniel M. Levin (Springfield, Illinois: Charles C. Thomas, 1962), p. 289.

[38]Punt, The Singer's and Actor's Throat, p. 34.

The vital importance of a preliminary laryngeal examination when the subject is in a healthy, rested condition has already been discussed (see pp. 53-4). Only if the appearance of the larynx in a state of health is known to the examiner and only if the history he elicits from the patient includes information regarding recent vocal use in the diagnosis of functional abuse truly reliable.

Dr. Y. P. Kapur, a medical laryngologist on the faculty of the Department of Audiology and Speech Sciences at Michigan State University, performed three indirect laryngoscopic examinations on each of the eight subjects during the course of the present study. The checklist he used to record his observations can be found in Appendix A-V.

Procedural Summary for Collection of Data.--In order to facilitate the comprehension of the order in which the data were gathered for this study, a copy of each interview outline has been provided in Appendices A-VI, A-VII, and A-VIII, respectively.

Processing and Analysis of Collected Data

When the collection of all data had been completed and with the help of the Instructional Media Center at Michigan State University, the researcher made a series of master tapes from the individual tapes recorded at each interview in order to facilitate the analysis of that data. For example, all the subjects' readings of the uniform passage were recorded on one master tape; all the subjects' conversational samples on another master tape; and all the subjects' readings in character on yet a third.

The order in which individual samples were recorded was randomized for all master tapes but one.[39]

Randomization has been described by Cochran and Cox as somewhat analogous to insurance. Both are precautions against disturbances that may or may not occur and that may or may not be serious if they do occur.[40] These authors have advised researchers to take the trouble to randomize even when it is not expected that there will be any serious bias from failure to do so. Accordingly, recorded samples used in the present study were placed in random order as they were recorded onto master tapes. The methodology used for this randomization has been described by Blommers and Lindquist[41] and is quite simple: slips of paper representing each sample were placed into a container, shaken up, and then drawn out to determine order.

A summary of the master tapes recorded and randomized will be found in Table 1, on the following page. Once the master tapes were completed, the analysis of the collected data was begun. The methodology for each of the analyses is discussed under separate headings.

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[39]The one exception was the tape containing the readings in character from the script of Marat/Sade. Because the selections read by all four inmates were identical, samples were ordered so that the inmates' performances were separated from one another by the major actors' performances.

[40]W. G. Cochran and G. M. Cox, Experimental Designs (New York: John Wiley & Sons, Inc., 1950), p. 8.

[41]Paul Blommers and E. F. Lindquist, Elementary Statistical Methods in Psychology and Education (Boston: Houghton Mifflin Company, 1960), p. 245. For further excellent discussion of both principles and methods of randomization, see D. R. Cox, Planning of Experiments (New York: John Wiley and Sons, Inc., 1958), Chapter V: "Randomization."

TABLE 1

MASTER TAPES USED IN THE ANALYSIS OF DATA

Tape Number	Contents	Used for Analysis Of
I	24 readings of uniform passage, random order	habitual pitch--reading habitual rate--reading
II	24 readings of uniform passage, 8x3 in order A	quality evaluation--Panel A; use of hard glottal attack
III	24 readings of uniform passage, 8x3 in order B	quality evaluation--Panel B
IV	16 readings by actors in character*	character pitch, character rate, character quality; use of hard glottal attack and breathing efficiency in character
V	24 conversational samples, random order	habitual pitch--speaking
VI	24 conversational samples, 8x3 in order C	quality evaluation--Panel A
VII	24 conversational samples, 8x3 in order D	quality evaluation--Panel B
VIII	48 range samples, 8x2x3 in random order	bottom and top notes of range
IX	24 reading monotones plus 24 speaking monotones, random order	habitual pitch for reading and for speaking

*The first of the three selections for each major actor; all three selections for the inmate subjects.

Habitual Pitch for Reading, Speaking, and Characterization.--A number of authors have agreed that habitual pitch can be determined by simply listening to a subject read or speak, since this is the pitch level which will recur most frequently. Ordinarily, some variation from this pitch will be observed (e.g. with an increase in loudness); but the most frequently occurring pitch used by a reader or speaker is nevertheless usually obvious enough to be identified. The method by which this was accomplished in the present study was adapted from the procedure described by Van Riper.[42] The determination of habitual pitch for each subject for reading, speaking, and characterization was made using Master Tapes I, IV, and V. The most frequently recurring pitch found in each sample was located on a piano and was indicated as a note on the musical scale.

For a few of the voices, this task was a bit difficult because the habitual pitch of a low male voice had to be found using the researcher's alto range. Practice and repetition of this procedure on different occasions appeared to eradicate this difficulty, however. Furthermore, two male voice specialists in the Department of Audiology and Speech Sciences at Michigan State University were asked to conduct the same procedure independently.[43] The results obtained by all three researchers were used

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[42]Van Riper, Speech Correction: Principles and Methods (4th ed.), pp. 468-469.

[43]The researcher was fortunate enough to obtain the services of Dr. Leo V. Deal, the voice specialist on the faculty in the Department of Audiology and Speech Sciences. Dr. Deal has a Ph.D. in Speech (with a specialization in speech science and hearing), has had extensive clinical and teaching experience, and was working closely with the researcher throughout the present study. The second voice specialist was a Ph.D. student, a graduate assistant in the Department of Audiology and Speech Sciences with both clinical and teaching experience.

in designating habitual pitch. This incorporation tends to increase both the validity and the reliability of the results by eliminating the tendency of any one evaluator to judge either consistently sharp or consistently flat.

A second procedure was used to determine habitual pitch for reading and speaking but not for characterization. This procedure requires the speaker or reader to diminish his inflections to a monotone and then to sustain the resulting note until it can be located on a pitch pipe or a piano.[44] Using Master Tape IX, the researcher located habitual pitch for both reading and speaking for all the samples on two separate occasions. Those samples for which results differed from the first evaluation to the second were rechecked via a third evaluation. The two voice specialists assisting in the study spot-checked the tape independently, and their results were considered in formulating all final designations.

Habitual Rate for Reading and Characterization.--Habitual rate for reading was computed using Master Tape I. The uniform selection read by all the subjects was 300 words in length. The length of time in seconds was determined for each reading, and then the rate was calculated in number of words per minute. In order to determine reading rate for characterization, the number of words in each of the three passages read by each subject was counted, and the amount of time taken by the subject to read each passage was determined. The number of words per minute for each passage was computed, and the three figures were averaged in order to arrive at a habitual rate for a particular characterization.

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[44]Murphy, Functional Voice Disorders, p. 94. Also, see p. 91 of the present study.

Occurrence of Hard Glottal Attack in Reading and Characterization.--The use of hard glottal attack is one of the most frequent faults in speaking and singing. It is common in actors and public speakers and can be very harmful to the vocal cords.[45] Hard glottal attack is common during anger or emotional involvement, and often occurs as a result of an increase in loudness.[46]

In the present study, a determination of the number of hard glottal attacks used by each subject was made for both reading aloud and characterization. In order to make this determination, Master Tapes I and IV were used. By turning the volume control on the tape recorder up higher than necessary, hypervalvular phonation or hard glottal attack could be heard. Copies of the material being read were marked in each place in which a hard glottal attack occurred. This procedure was repeated on a second occasion, and any differences in notation were rechecked via a third listening.

Breathing Efficiency during Reading and Characterization.--The breathing efficiency of each subject during reading and characterization was determined in two ways. As each subject read the uniform selection and from the script of Marat/Sade, a visual determination of the number of breaths he needed was made and notated on a copy of the material. This count was double-checked by listening to Master Tapes I and IV with the

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[45]Brodnitz, Vocal Rehabilitation, p. 19.

[46]I. P. Brackett, "Parameters of Voice Quality," in Handbook of Speech Pathology and Audiology, ed. by Lee Travis (New York: Appleton-Century-Crofts, 1971), p. 447.

volume turned up higher than normal. In addition, the location of major muscular activity during inhalation was observed at this time and indicated on the proper form (see Appendix A-IV).

Vocal Range Including Falsetto.--To ascertain vocal range for each subject, Master Tape VIII was used. By listening a number of times to each subject singing down to the bottom of his range and then up as high as he could, both extremes of the range could be identified as musical notes on a piano. As was mentioned earlier, a few of the subjects, untrained vocally, had a bit of difficulty with this task (see page 93). Consequently, the range procedure was repeated at each interview session for each subject, and the results of both trials were combined. The lowest and highest pitches sung by each subject in either of the two trials were noted. To improve the validity and reliability of the results thus obtained, the two consulting voice specialists spot-checked the range tapes independently; final designations were made on the basis of all three listeners' results.

Optimum Pitch.--The results of the range determination procedure described above were used to compute optimum pitch for each of the eight subjects. The manner in which these results were used was dictated by earlier research.

In 1940, Wentworth did a study of 25 standard speech texts and found a number of methods recommended for determining natural or optimum pitch level. Among them were locating the middle note of the pitch range, locating the pitch one musical third below the middle pitch in the range,

finding the note one-third up the range from the lowest tone phonated, finding the tone five notes up from the lowest tone phonated, finding the note easiest for the speaker to produce, or finding the note at which the loudness swelled as the speaker sang up his range.[47] In 1949, Thurman demonstrated that the method of locating natural pitch level by finding the pitch at which the intensity of the tone being sung swells was invalid.[48] Aside from his research, it has not been proven that any of the remaining methods is demonstrably superior to the others for determining optimum pitch.

However, Pronovost's research in 1942 is generally accepted as having established the best methodology for the determination of optimum pitch. In his report on his research, Pronovost listed five different methods for determining natural pitch level. After investigating the accuracy and reliability of these methods, Pronovost concluded that the results of his study afforded no means of selecting the best of the five methods. However, other considerations seemed to indicate that the most convenient method to use was the 25 per cent method, which locates the optimum pitch 25 per cent of the way up the total singing range including falsetto.[49] Thus,

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[47]E. T. Wentworth, "Survey of Methods for Improvement of Pitch Usage in Speech as Presented in Twenty-Five Current Speech Texts" (unpublished M. A. thesis, University of Iowa, 1940).

[48]W. L. Thurman, "An Experimental Investigation of Certain Vocal Frequency-Intensity Relationships Concerning Natural Pitch Level" (unpublished M. A. thesis, University of Iowa, 1949).

[49]Pronovost, "Natural and Habitual Pitch," p. 121. See also Grant Fairbanks, Voice and Articulation Drillbook (New York: Harper and Brothers, 1940), p. 168.

in the present study, the 25 per cent method was utilized to calculate optimum pitch for each of the eight subjects.

Voice Quality in Reading, Conversational Speech, and Characterization.--Despite the fact that the evaluation of voice quality is described in the literature as being a somewhat complicated and imprecise procedure (see pp. 24-5), the decision was made to incorporate a quality evaluation into the analysis of the collected data. Many authors who know the limitations have nevertheless recommended that such an evaluation should be incorporated into any standard voice diagnosis.[50]

In her study of the vocal quality and pitch of voices suspected of laryngeal pathology, Lunday recorded a number of patients reading identical materials and had the resulting tapes judged by graduate students majoring in speech science. The tapes were presented to these judges in random order, and the panel was asked to rate vocal quality and pitch via a nine-point equal-interval scale.[51] In his study of the reliability of certain testing procedures, Young used twelve graduate students in speech pathology without appreciable clinical experience and without training in psychological scaling methods. He found that, even without the benefit of practice tapes, his judges could somewhat reliably evaluate severity of stuttering on a nine-point equal-appearing interval scale.[52] On the

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[50]See, for example, Van Riper, Speech Correction: Principles and Methods (3rd ed.), p. 311.

[51]Lunday, "The Vocal Quality and Pitch of Voices Suspected of Laryngeal Pathology," pp. 21ff.

[52]Martin A. Young, "Observer Agreement: Cumulative Effects of Rating Many Samples," Journal of Speech and Hearing Research, XII (1969), 137.

basis of their research on methods of audience evaluation of vocal deviation, Lewis and Tiffin concluded that the method least open to objection made use of the psychophysical law of comparative judgment.[53] The methodology used or recommended in these experiments formed a basis for the quality evaluation procedure employed in the present study.

When using a panel of judges to evaluate voice quality, it is important to consider the weaknesses inherent in the methodology itself. For example, it is a rather well-known fact that whether judges are highly trained or not, they can agree only about the very good and the very bad. Evaluations tend to be less reliable in the middle areas where events are of almost equal quality.[54] Although perceivable variation may indeed occur in the voice of a subject, there are variables contributed by each individual evaluator as well. A group of students or even experienced therapists listening to a recorded voice sample will not evaluate it consistently; opinions of the same sample may range from too low in pitch to too high in pitch and from denasal to hypernasal. Personal tastes and differences in background or training reveal themselves constantly in group evaluations. Among the available research and discussions documenting the inability of even highly qualified judges to agree consistently in evaluating voice quality, those of Perkins,[55] Black,[56] and

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[53]Don Lewis and Joseph Tiffin, "A Psychophysical Study of Individual Differences in Speaking Ability," Archives of Speech, I (January, 1934), 44.

[54]Ernest G. Bormann, Theory and Research in the Communicative Arts (New York: Holt, Rinehart and Winston, 1965), p. 291.

[55]Perkins, "Vocal Function: A Behavioral Analysis," pp. 496-497.

[56]J. W. Black, "A Study of Voice Merit," Quarterly Journal of Speech, XXVIII (1942), 67-74.

Thurman[57] are particularly noteworthy.

On the basis of this research, quality evaluation by a panel of judges are undertaken in the present study with the following reservation: agreement among panel members regarding quality deterioration or improvement in the voices being evaluated would be considered significant only when there was ample supportive evidence offered on the basis of more reliable tests performed at the same time. Such an approach seems particularly necessary when the voices being judged are not clinically deviant to begin with, and when these voices are being compared with themselves rather than with the voices of other speakers.

In the present study, a panel of twenty judges was convened to evaluate voice quality on the basis of tape recordings of the eight subjects reading a uniform selection, speaking conversationally, and reading from the script of Marat/Sade. The panel was composed of one undergraduate senior majoring in speech pathology and eighteen M. A. and Ph. D. students in speech pathology enrolled in a graduate course in voice disorders at the time the study was in progress, and the teacher of that voice course--a faculty member in the Department of Audiology and Speech Sciences at Michigan State University. Seven of the twenty had less than one year of clinical experience, nine had between 150 and 500 hours of clinical experience, and four had five years or more of clinical experience. Judging sessions were held on two consecutive nights, in a quiet classroom.

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[57]W. L. Thurman, "The Construction and Acoustic Analysis of Recorded Scales of Severity for Six Voice Quality Disorders" (unpublished Ph. D. dissertation, Purdue University, 1954).

Each judge was requested to attend one of the two sessions scheduled. On the first night, one panel of ten judges listened to Master Tapes II, IV, and VI; on the second night, the other panel of ten judges listened to Master Tapes III, IV, and VII.

When the judges were assembled, each was given a packet of materials containing:

1) a questionnaire concerning the judge's background and training;

2) definitions of terms and instructions for evaluating the tapes to be heard; and

3) a number of evaluation forms to make his evaluations more methodical.

The basic outline for the evening's procedure was presented. The quality definitions to be used by the judges in making their evaluations were presented both orally and in writing. Any questions the judges had regarding these definitions were answered before the tapes were played.

Two types of evaluative tasks were required of each judge. While listening to the same subject do the same reading three times consecutively or to three samples of each subject speaking conversationally about various topics, each judge was requested to evaluate pitch, loudness, rate, and quality for each sample. After listening to each series of three, the judges were asked to rank order the samples: I for best voice quality, II for average voice quality, and III for worst voice quality. After a short break, the judges listened to the eight actors reading in character from Marat/Sade and described (with the help of a checklist) the rate, loudness, pitch, and quality used by each actor in his particular characterization. In other words, the judges were requested to rate the readings and conversational speeches on a relative scale and to describe

the reading in character in terms of an absolute scale. For the uniform readings and conversational samples, each subject was being compared with himself; for the readings from Marat/Sade, each voice was being described by the judges without comparison to other samples. The forms used for these quality evaluations were adapted from that found in the Johnson, Darley and Spriestersbach text, Diagnostic Methods in Speech Pathology.[58] Copies of these forms can be found in Appendix A-IX.

An Overview of the Methodology

A descriptive study was conducted to investigate the relationship between the demands of a characterization and the occurrence of functional voice problems in the male actor.

A list of criteria was created which would meet the needs of such a study, and on its basis, the 1969 Performing Arts Company production of Marat/Sade at Michigan State University, directed by Dr. Sidney Berger, was selected as the focal point around which the data collection would be organized. Eight actors cast in this production were selected as subjects for the study, and divided into two groups, designated as the experimental group and the control group. The experimental group consisted of the four actors cast in the most vocally-demanding roles in the play. The control group consisted of four actors with relatively little training or experience cast as inmates in this production.

The study was constructed around a series of interviews and laryngeal examinations held at the beginning of rehearsals, during the week of

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[58]Johnson, Darley, and Spriestersbach, Diagnostic Methods in Speech Pathology, p. 78.

production, and following the close of Marat/Sade (see Appendix C-I). Data collected at each interview included:

1) familial, medical, educational, and vocal history;

2) information obtained on the basis of spectator observation;

3) recorded samples of each subject's voice during reading, conversation, and characterization; and,

4) physical examination of the vocal mechanism.

In addition, a production log was compiled, in which were entered the comments made by the director to the actors regarding use of voice (see Appendix C-II).

In recording materials for subsequent analysis, the researcher collected data which would permit the assessment of:

1) habitual pitch for reading and speech;

2) habitual rate for reading;

3) maximum pitch range;

4) maximum duration of phonation;

5) use of hard glottal attack during reading; and

6) voice quality during reading and speech.

In addition, materials were recorded from which pitch, rate, quality, and use of hard glottal attack during characterization could be determined.

Data collected at all interviews were processed with the assistance of the Instructional Media Center at Michigan State University. In order to facilitate subsequent analysis, nine master tapes were made from the individual tapes recorded at each interview (see Table 1, page 98). The order in which individual samples were recorded onto each master tape was randomized to avoid any bias during the analysis of data.

Data were analyzed by the researcher with the assistance of two voice specialists in the Department of Audiology and Speech Sciences at Michigan State University. A panel of judges was also convened to evaluate voice quality during reading and speech and to describe voice quality during characterization. Data obtained at all interviews on pitch, range, rate, breathing location and efficiency, level of tension, maximum duration of phonation, use of hard glottal attack, and voice quality were then tabulated and compared in order to ascertain the effects of production demands on the vocal characteristics and laryngeal condition of the male actor during the course of a production of a full-length play.

CHAPTER IV

RESULTS AND DISCUSSION

The compilation and analysis of the data obtained according to the methodology discussed in Chapter III yielded results in a number of different areas. After a preliminary identification of each of the eight subjects participating in the study, this chapter reports the results obtained and provides a discussion of these results and their implications.

In order to simplify the comparisons of collected data, Subjects I, II, III, and IV were designated as the experimental group and Subjects V, VI, VII, and VIII were designated as the control group on the basis of the size of their roles in Marat/Sade (see pp. 80-81). General information about each subject is summarized in Table 2 on the following page. Before summarizing, comparing, and discussing the data compiled from each of the tests and analyses performed on the voices and vocal mechanisms of each subject, it is of value to briefly discuss additional relevant information provided by the initial case history completed at the first interview.

TABLE 2

IDENTIFICATION AND GENERAL DESCRIPTION OF SUBJECTS

	SUBJECT	AGE	OCCUPATION	ROLE PLAYED IN MARAT/SADE	PHYSICAL DESCRIPTION
EXPERIMENTAL	I	22	Junior majoring in Theater at M. S. U.	Duperret	Height: 5'9" Weight: 140 pounds State of Health:* Good
	II	22	M. A. student in Theater at M. S. U.; Actor in Performing Arts Company	Marquis de Sade	Height: 6'1" Weight: 265 pounds State of Health: Good
	III	25	Ph. D. student in Theater at M. S. U.; Actor in Performing Arts Company	Jean-Paul Marat	Height: 5'9½" Weight: 115 pounds State of Health: Good
	IV	28	Ph. D. student in Theater at M. S. U.; Actor in Performing Arts Company	Jacques Roux	Height: 6'2" Weight: 150 pounds State of Health: Good
CONTROL	V	18	Freshman majoring in Journalism at M. S. U.	Inmate-Musician	Height: 5'2½" Weight: 118 pounds State of Health: Good
	VI	20	Junior majoring in Communication at M. S. U.	Inmate	Height: 5'9" Weight: 170 pounds State of Health: Good
	VII	20	Junior majoring in Honors Program at M. S. U.	Inmate	Height: 6'2" Weight: 170 pounds State of Health: Fair
	VIII	21	Junior majoring in Theater at M. S. U.	Inmate	Height: 6'3" Weight: 300 pounds State of Health: Good

*As described by the respective subjects.

Initial Case History

Results.--Both medical history of direct relevance to the present study and the smoking habits of each subject (as obtained from the subjects' own descriptions) are summarized in Table 3 on the following page.

The experimental group, comprised of the actors playing the major roles in Marat/Sade, had far greater theatre experience than did the control group (the actors cast as inmates). This experience consisted of acting, directing, and teaching. The experimental group included one subject with nine years of summer stock experience and one with three years of summer stock experience; the other two subjects had one year apiece. Three of the four subjects in the experimental group were paid members of the Performing Arts Company at Michigan State University, having earned their positions on a highly competitive basis. All four members had done some teaching, one on the high school level for four years, and one on the college level for two and a half years. On the other hand, the control group had no vocational experience related to theatre.

An investigation of the number and kind or roles played by each subject in the past produced comparable results. All the members of the control group had very little acting experience; one had played only two roles and three had played between six and eight roles on both the high school and college levels, few of which were major.[1] In contrast, all

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[1]For purposes of classification, a minor role was defined as a walk-on or a role consisting of no more than twenty lines of script. A major role would therefore be defined as one containing a minimum of twenty-one lines.

TABLE 3

SUBJECTS' MEDICAL HISTORIES AND SMOKING HABITS

	SUBJECT	HEARING*	RESPIRATORY INFECTIONS	ALLERGIES	THROAT SURGERY	SMOKING HABITS
EXPERIMENTAL	I	Good	suffered pneumonia in 1962	none	T & A (1952)	one pack per day
	II	Good	none	has always had seasonal hay fever	T & A (1952)	a few cigarettes per day
	III	Fair	none	has had seasonal hay fever since adolescence	none	one-half pack per day
	IV	Good	suffered childhood asthma between ages of three and ten	allergic to feathers as a child	T & A (1948?)	no
CONTROL	V	Good	continual history of frequent colds	none	T & A (1954)	no
	VI	Good	none	none	none	one pack per day
	VII	Good	history of pneumonia; chronic asthmatic bronchitis for the past year; frequent colds; pneumonitis	none	T & A (1957)	no
	VIII	Good	none	continuous allergy to cats	none	no

*Only one of the subjects had actually had his hearing tested within the last five years, but, to the best of their knowledge, none suffered any major impairment.

four members of the experimental group had considerable production experience as actors and three of the four had directed as well. One member of this group had played at least ten roles, some of them major, in college productions and in paid summer repertory. The other three had played a minimum of fifteen to twenty roles apiece, many of them major, in college, graduate schools, summer stock, community theatres, and professional theatres.

An investigation of the extent and type of training gave neither group a distinct advantage over the other in terms of speech and voice, vocal music, or dance and physical education. However, the experimental group did have far more acting training than did the control group. A summary of relevant craft training is presented in Table 4, page 116.

On the basis of additional information provided in the initial case histories, very few of the subjects showed a really knowledgeable approach to relaxation and vocal warm-up techniques, although the experimental group was considerably more sophisticated in this respect than was the control group. A summary of warm-up techniques used by the subjects during rehearsals and before performances in their past is provided in Table 5, page 118.

The questions in the final part of the initial case history were designed to ascertain whether and to what extent any of the subjects had suffered or were suffering any symptoms of functional problems. Although none of the subjects had ever consulted a laryngological specialist, questions regarding vocal symptomology revealed that four out of the eight (Subjects II, III, IV, and VIII) had felt on one or more occasions that they were losing their voices; Subject II had in fact lost his voice

TABLE 4

SUMMARY OF EXTENT AND TYPE OF CRAFT TRAINING

	SUBJECT	SPEECH AND VOICE		VOCAL MUSIC		ACTING		DANCE AND PHYSICAL EDUCATION	
		WHEN	TYPE	WHEN	TYPE	WHEN	TYPE	WHEN	TYPE
EXPERIMENTAL	I	1 term in high school	public address		none	1½ years	beginning, advanced, & styles of acting	4 years in college	modern dance, ballet, & jazz dance
	II	2 terms in high school; 3 semesters in college	introduction to speech, phonetics; training the speaking voice (Lessac System)	2 years in college	voice development	1 term in high school; 2 years college; 1 term graduate school	fundamentals, advanced, scene study, styles, theatre games, practicum	1 term in college; 1 summer in stock	theatre dance; ballet
	III	1 term in high school; 2 terms in college	making speeches; public address; extemporaneous speaking		none	2 terms college; 1½ years in graduate school	beginning, advanced, scene study, practicum		none
	IV	1 term in college	public speaking		none	1 term in high school; 2 courses in college; 4 courses in graduate school	scene study (many times) graduate practicum	3 months in college	modern dance performance workshop

CONTROL	V	1 term in high school	public speaking		none	1 year in high school	combination history of theatre and acting	about six months	karate and judo
	VI	1 year in high school	general speech; combined voice and acting		none	1 term in high school; 1 term college	both scene study courses		none
	VII	1 term in college	oral interpretation	six weeks during summer of '65	voice training at music institute		none	1 term in high school	tumbling
	VIII	1 term in high school	general speech course	1 term in high school	glee club	1 year in high school; 2 years college	principles of acting; scene study	1 term in college	modern dance

TABLE 5

WARM-UP PROCEDURES UTILIZED BY SUBJECTS

	SUBJECTS	TYPE OF WARM-UP	
		RELAXATION AND LIMBERING UP	VOICE AND SPEECH
EXPERIMENTAL	I	concentration exercises, dance exercises, loosening of jaws, lips, and tongue, deep breathing.	pitch range exercises
	II	extensions, knee-bends, twists; massaging larynx while rolling head until larynx can be moved easily; shaking out arms and hands.	singing nine-note scales; warming up the register in which the character would be played.
	III	calisthenics, tension-release exercises, breathing and limbering up tongue and facial muscles; shaking out the head and legs.	duration exercises, pitch levels, intensity, inflectional changes; humming, singing, recitation of lines from the play.
	IV	mental relaxation exercises; simple physical exercises--push-ups, toe touches, jumping jacks.	"guttural noises"
CONTROL	V	none	none
	VI	emptying mind and mental concentration and improvisation exercises; bendover loosening exercises.	none
	VII	concentration on specific location and production.	none
	VIII	touching toes, trunk rolls, shaking all the tension out of the body, jumping.	humming different tones

completely on at least two occasions in his recent past by screaming and misusing his voice.

Because patterns of functional misuse are so easily and frequently habituated (see p. 40), it seemed conceivable that Subjects II, III, IV, and VIII as a group might suffer a greater number or more serious symptoms of functional problems in the present study than the other four subjects. An analysis of data collected during the course of the study, however, indicated that this was not the case (see p. 168).

To summarize, information obtained via the initial case history concerned both medical and experiential data for each subject. Although the experimental group was not separated distinctly from the control group in terms of noticeable differences in medical history (see Table 3), the groups were different from one another with regard to vocational experience, acting experience, type and extent of training, and employment of pre-performance warm-up techniques. The experimental group had relatively extensive vocational experience in theatre, whereas the control group had none. The control group had played fewer, less important roles in past productions than had members of the experimental group. The experimental group had more acting training than did the control group. Differences in speech and voice, vocal music, and dance and physical education training were very minor (see Table 4). Finally, the experimental group was somewhat more knowledgeable in the use of pre-performance warm-up techniques than was the control group (see Table 5).

At least half the subjects reported that they had, some time in their past, felt as if they were losing their voices. These subjects as a group,

however, did not fare worse under the conditions of the present study than those who did not report such a history (see p. 168).

Discussion.--The use of the orally-administered case history questionnaire at all preliminary interviews proved to be a valuable tool in this study. Medical and experiential history provided by each subject enabled the results of objective voice tests to be interpreted contextually. A relatively accurate and complete picture could be obtained of the background and condition of each subject as he entered into the study. However, a number of relevant questions were not answered or answered inadequately by using the case history questionnaire.

For example, it proved exceedingly difficult to assess the quality of any training the subjects had had in the past. The ultimate test of voice training, for example, most probably lies 1) in the flexibility and durability of a subject's voice under the pressures of rehearsal and performance, and 2) in the absence of functional voice problems. However, for the actors coming into this study, no reliable way was built into the methodology by which to evaluate their voice training; a determination was never made of the relative value of a one-term speech course in high school, a one-term oral interpretation course in college, a year of public speaking courses in college, or one semester of glee club. The performance of each subject during the course of the study therefore became the only possible gauge of the value of voice training he had undergone in the past.

Breathing Efficiency, Use of Hard Glottal Attack, and Habitual Rate

Results.--Table 6 indicates the number of breaths taken by each subject during his reading of a uniform passage at each of three interviews. In addition, it indicates the number of hard glottal attacks used by each subject and his rate in words per minute during reading. An examination of Table 6 (on the following page) reveals that six out of the eight subjects needed a slightly greater number of breaths to read the same passage at the second interview than they did at the first interview. Furthermore, five out of the eight subjects needed their smallest number of breaths to get through the uniform selection at the final interview. This may be due to a decrease in the breathing efficiency of Subjects I, II, III, V, VI, and VII between the first and second interviews and to an increase in breathing efficiency in Subjects, I, III, IV, V, and VII between the second and third interviews. However, this pattern might also be attributable to: 1) the corresponding change in habitual reading rate; 2) increasing familiarity with the passage being read; or 3) simple chance occurrence.

It also seems that some of the subjects may have been more efficient breathers during reading than others. A count of the number of breaths needed by each subject to get through the same reading selection indicates that although the differences among subjects are not always great, Subjects II, V, and VI seem to be noticeably more efficient breathers than Subjects III, VII, and VIII.

The number of hard glottal attacks did not seem to follow any clearly discernible pattern. The least efficient breathers did not exhibit the greatest number of hard glottal attacks, nor did the most efficient

TABLE 6

BREATHING EFFICIENCY, HARD GLOTTAL ATTACK, AND RATE FOR UNIFORM READINGS

	SUBJECT	INTERVIEW	NUMBER OF BREATHS	NUMBER OF HARD GLOTTAL ATTACKS	RATE IN WORDS PER MINUTE
EXPERIMENTAL	I	1	23	1	183.7
		2	24	2	182.6
		3	18	2	182.2
	II	1	19	4	192.7
		2	20	3	183.7
		3	20	0	200.7
	III	1	28	7	160.7
		2	29	3	178.2
		3	20	3	192.1
	IV	1	23	0	195.7
		2	23	3	188.3
		3	22	1	192.7
CONTROL	V	1	20	1	189.5
		2	22	1	184.0
		3	18	0	205.2
	VI	1	16	0	212.5
		2	20	1	205.4
		3	21	3	200.9
	VII	1	25	2	191.9
		2	28	2	196.4
		3	21	2	194.4
	VIII	1	29	1	169.1
		2	25	6	168.8
		3	27	5	170.8

breathers exhibit the smallest number. The actual number of hard glottal attacks did not uniformly rise or fall between any two sets of interviews. Similarly, fluctuations in rate did not appear to follow a clearly discernible pattern from interview to interview. Although six of eight habitual rates were lower at the second interview than they were at the first and although five of eight habitual rates were higher at the third interview than they were at the second, these differences could be attributed to simple chance. However, a comparison of these measurements for reading a uniform selection with the same measurements taken for characterization does reveal a number of differences. Measurements of the breathing efficiency, number of hard glottal attacks, and habitual rate for the eight subjects reading in character from the script of Marat/Sade are summarized in Table 7 on the following page. For the measurements relating to reading in character, each subject read three different selections from the script. Members of the experimental group read individualized selections, whereas members of the control group read the same three selections. Examination of the results summarized in Table 7 do not indicate any behavioral differences between the experimental group and the control group. This might indicate that the actual size of a role in number of lines was not a determinant of vocal performance during tests of breathing efficiency, use of hard glottal attack, and habitual rate. However, the results do reveal some discernible trends in the eight subjects as a group.

In sixteen out of twenty-three selections read (and in at least one selection for each subject), the subjects needed a greater number of breaths at the second interview than they did at the first to get through

TABLE 7

BREATHING EFFICIENCY, HARD GLOTTAL ATTACK, AND RATE IN CHARACTERIZATION

	SUBJECT	SELECTION	NUMBER OF BREATHS		NUMBER OF HARD GLOTTAL ATTACKS		RATE IN WORDS PER MINUTE		CHARACTER RATE IN WORDS PER MINUTE	
	INTERVIEW		1	2	1	2	1	2	1	2
EXPERIMENTAL	I	1	13	18	0	1	153.1	119.5	160.2	130.3
		2	9	7*	3	0*	172.9	125.1*		
		3	7	10	0	1	154.6	146.3		
	II	1	23	28	9	10	137.1	123.7	110.1	114.1
		2	16	16	9	8	100.3	128.0		
		3	7	10	2	3	92.9	90.6		
	III	1	31	26	11	1	158.9	161.0	156.8	139.4
		2	23	23	6	0	154.1	142.6		
		3	8	18	3	2	157.3	114.7		
	IV	1	18	17	1	1	184.6	156.4	176.4	147.8
		2	15	18	0	0	171.2	136.0		
		3	4	6	0	0	173.6	151.1		
CONTROL	V	1	5	5	0	0	191.1	133.7	176.6	135.2
		2	7	12	1	1	179.3	145.3		
		3	4	7	0	0	159.4	126.6		
	VI	1	4	5	1	1	171.4	182.9	168.8	155.2
		2	6	9	0	1	204.7	164.7		
		3	6	10	2	0	130.3	118.1		
	VII	1	7	7	1	0	193.2	159.1	173.6	139.7
		2	14	13	2	1	216.4	134.1		
		3	9	11	0	0	111.2	126.0		
	VIII	1	5	6	0	0	161.3	160.6	134.7	124.1
		2	9	12	0	0	152.3	122.7		
		3	6	7	0	0	90.5	89.1		

*At the second interview, Subject I performed only half of his second selection, because the director had divided up that section between him and Charlotte Corday. In addition, this selection was sung at the second interview (as it was in the show), which of course affects breathing, rate, and glottal initiation. Consequently, it was not considered in computing results of the data collection for this subject, and reported results therefore number 23 instead of 24 in some instances.

the readings. The number of hard glottal attacks in the character readings remained the same between interviews far more often than it either increased or decreased. This would seem to indicate that in the same subject doing the same reading on different occasions and under somewhat different conditions,[2] the use of hard glottal attack in characterization is more a result of habit, artistic choice, or chance than a symptom of a functional voice problem.

Rate results for characterization were particularly revealing. In nineteen out of twenty-three readings (and in at least two out of three readings for each subject), the rate in words per minute was lower for the second interview than it had been for the first. As a matter of fact, for seven out of the eight subjects, the computed character rate in words per minute was considerably lower at the second interview than it had been in the first. The one exception, Subject II, had the slowest rate by far of all the subjects at both interviews and showed only a slight increase in that rate between the first and second interviews (see Table 7). It would therefore seem that the experience of a full four weeks of rehearsal would lead the actor reading in character from a script of a production to decrease his rate.[3] Most probably, this decrease is attributable to: 1) the development of character subtext by the actor, 2) the actor's internalization of the rhythm of the

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[2]In the present study, conditions were altered by the experience of four weeks of rehearsal in the roles being read and by individual fluctuations in state of health and in condition of the throat and larynx.

[3]This finding contradicts Goates' earlier observation that actors actually increase their rate for characterization during the course of rehearsals. See Goates, "Pitch Changes in Actors," p. 49.

section of the play in which a particular speech occurs, and 3) the influence of the play's director in the shaping of the speech itself. As a matter of fact, a perusal of the Production Log (see Appendix C-II) reveals that the director did give occasional notes to individual actors regarding their rate during certain speeches.

Discussion.--The considerable lowering of rate which was characteristic of the group as a whole between the first and second interviews may explain the increase in the number of breaths required by the subjects for their readings in character. Other possible causes of this increase include both decreased breathing efficiency in the subjects and their exercise of dramatic choice. In other words, at the second interview subjects may have breathed more often not because they actually needed more air to produce voice but rather for purposes of characterization or dramatic emphasis. The fact that an increase in the number of breaths needed by the subjects occurred with relatively the same regularity for the character readings as it did for the readings of the uniform selection (see Table 6, page 122), would suggest that a decrease in breathing efficiency was responsible. However, the fact that the extent of change for both breathing and rate was far greater for the character readings than for the uniform selections would suggest that some conscious choice on the part of the actors was also involved. In any case, the disparity between results obtained on the basis of uniform reading selections and those obtained on the basis of readings in character would tend to rule out the possibility that such fluctuations were due to sheer chance.

Location of Major Breathing Activity and Observable Tension

Results.--A comparison of the breathing records compiled at all three interviews indicated that seven of the eight subjects were central breathers. This means that direct observation of their habitual breathing patterns while at rest or while speaking or reading revealed that the area of greatest muscular activity during inhalation was located near the diaphragm, beneath the rib cage (see p. 88). Subject II deviated only slightly from this pattern. He was a chest breather; although the area of major muscular activity was not actually high enough to be considered clavicular, it was located at the top of the rib cage, near the armpits, during the first and second interviews (although not at the third interview).

A number of the subjects, however, used a noticeably different breathing pattern while reading in character from the script of Marat/Sade. Subjects I and III, although consistently central breathers during all three interviews, switched noticeably into clavicular breathing every time they read in character from the script. Subject VI behaved similarly during the first interview but remained consistently a central breather even when in character during the second interview. Subject IV breathed centrally throughout his first interview but got into a pattern of high chest (although not clavicular) breathing when reading in character during the second interview. Subject II exhibited what some authorities consider a change for the better in his breathing activity when reading in character. Whereas he was observed to be a chest breather at both his first and second interviews, his readings in character took him into a breathing pattern which was more centrally located every time. It is perhaps

revealing to observe this occurrence only in the one subject who had a significant amount of both voice and speech and vocal music training.

Three subjects showed no difference in area of major muscular breathing activity from reading to characterization at both the first and second interviews. A logical assumption might be made on the basis of this observation. The fact that Subjects V, VII, and VIII showed no major change might be related to the fact that all three of them have some difficulty breathing, Subjects V and VII because of their respective histories of respiratory infection and Subject VIII because of his obesity (see Tables 2 and 3, pages 112 and 114, respectively).

Direct observation of the subjects to determine relative state of tension or relaxation at each interview proved somewhat inconclusive. To a certain extent, this is attributable to weaknesses in the methodology used to evaluate state of tension (see pp. 86-87 and Appendix A-IV). The lack of specificity inherent in the methodology made it necessary for the researcher to rely on subjective evaluation; results were somewhat tenuous. Consequently, the following observations must be evaluated with this fact in mind.

Six of the eight subjects were observed to be as tense or more tense at the first interview than they were at the second. This observation might lead to the conclusion that the subjects were somewhat apprehensive about the testing situation itself rather than exhibiting symptoms of functional problems during the preliminary interview. Similarly, seven out of the eight subjects exhibited more tension or as much tension in the limp hand test performed at the first interview than they did in the second. Rather than attributing perceived tension to the presence or

absence of general physical tension on different occasions, it is more logical to assume that increasing familiarity with the test being administered might have caused improved performance by subjects taking that test.

Discussion.--Direct observation of the location of major breathing activity during reading, speaking, and characterization is a valuable tool for the voice researcher. On the basis of this study, there are some grounds for conjecture concerning the relationship of changed breathing patterns to both the presence of functional voice problems and the techniques involved in characterization. Specific examination of the results of the indirect laryngological examinations, for example, reveals that out of the four subjects who exhibited organic evidence of functional voice problems at the second interview, three of them (Subjects I, III, and VI) also showed a tendency to breathe clavicularly when in character (see Table 17, page 149). In addition, all four members of the experimental group, when reading in character, exhibited some change in breathing location from their respective normal patterns. However, only one member of the control group did so and only at the first interview. It is possible that a change in breathing location may be a result of experience and training in acting or even of good acting instincts. A number of theatre writers concerned with acting, Antonin Artaud and Constantin Stanislavsky among them, have written about the importance of breathing in the development of characterization.[4] The fact that the more

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[4]See, for example, Antonin Artaud, The Theater and Its Double, trans. by Mary Caroline Richards (New York: Grove Press, Inc., 1958), pp. 136-139.

experienced, better trained actors in this study more consistently changed the location of their major breathing activity during characterization might therefore mean that they were more "in character" or more involved during their performances than the control group. Other possible reasons, such as the nature of the material being performed or the association of great tension with performance in the past, would have to be ruled out for this observation to be anything more than logical deduction.

Both direct observation of the subjects and the limp hand test administered during each interview proved to be too inefficient methodologically to form a basis for determining the subjects' levels of tension. Whereas the limp hand test may be useable on a one-time basis for enabling a researcher or clinician to ascertain general level of bodily tension (see pp. 87-88), other more reliable tests must be created if this level is to be determined for the same subject on different occasions.

Maximum Duration of Phonation

Results.--Results of the maximum duration of phonation test administered to all subjects at each interview are summarized in Table 8, on the following page. The results obtained in the duration of phonation test indicate no major trends among members of either sub-group or of the group as a whole. Three members of the experimental group and one member of the control group (Subjects I, II, III, and VIII) showed reduction in duration of phonation between the first and second interviews and an increase in duration of phonation at the third interview. Subjects IV and V showed

TABLE 8

MAXIMUM DURATION OF PHONATION IN SECONDS

	SUBJECT	FIRST INTERVIEW	SECOND INTERVIEW	THIRD INTERVIEW
EXPERIMENTAL	I	14.2	11.3	13.3
	II	21.7	20.5	23.9
	III	18.9	18.1	38.6 [sic]
	IV	20.8	21.2	27.6
CONTROL	V	32.3	33.1	34.6
	VI	16.4	22.0	14.0
	VII	24.0	27.5	24.1
	VIII	15.0	13.0	15.1

continual increase in duration of phonation from the first interview through the second to the third and Subjects VI and VII actually had their best scores at the second interview. The difference in duration of phonation were extremely small in some instances although relatively large in other.

Discussion.--It would appear difficult to rule out chance and to consider results obtained in the maximum duration of phonation test indicative of the presence or absence of a functional voice problem in the male actor. However, when the results of the indirect laryngological examinations and case history information provided at the second and third interviews were taken into consideration (see Table 17 and pp. 162-166),

maximum duration of phonation increased with an improvement in the condition of the larynx and a lessening of performance demands made on the voice, and it decreased with a worsening in the condition of the larynx and an increase in performance demands made on the voice for six out of the eight subjects (I, II, III, VI, VII, and VIII).

Another possible contributor to results obtained via this measurement would have to be ruled out, however. Maximum duration may very well improve as a result of repetition or even as a result of familiarity with the test. If subjects had been trained to take this test and given an opportunity to practice it, results probably would have been more reliable.

Pitch Range and Computed Optimum Pitch

An important characteristic of any voice is its range, especially the lowermost and uppermost limits of that range. The highest and lowest tones which a person is capable of producing are difficult to change. Because of this fact, any decrease in the vocal pitch range may be considered indicative of functional voice problems in the speaker.

Results.--Table 9 summarizes the results of the range test given at all three interviews. It also indicates the optimum pitch computed using the results of the range test administered at the first interview for each subject. Although all of the determinations indicated in Table 9 were made by the researcher, it was also true that there was good agreement between the results she obtained and those obtained by the consultants running independent tests for purposes of spot-checking.

TABLE 9

PITCH RANGE AND COMPUTED OPTIMUM PITCH

	SUBJECT	FIRST INTERVIEW	SECOND INTERVIEW	THIRD INTERVIEW	OPTIMUM PITCH COMPUTED
EXPERIMENTAL	I	C below Low C* C# above High C 38 half tones	C below Low C* A above Middle C 34 half tones	C below Low C* High C 37 half tones	A flat or A below Low C
	II	F below Low C B flat above High C 42 half tones	F below Low C E above High C 36 half tones	F below Low C B above High C 43 half tones	D or E flat above Low c
	III	F below Low C E above High C 36 half tones	E below Low C D above High C 35 half tones	E below Low C E above High C 37 half tones	D flat above Low C
	IV	E below Low C E above High C 37 half tones	E below Low C C# above High C 34 half tones	F# below Low C F# above High C 37 half tones	Low C
CONTROL	V	F below Low C E flat above High C 35 half tones	E below Low C D above High C 35 half tones	E below Low C E flat above High C 36 half tones	D flat above Low C
	VI	D below Low C D# above High C 38 half tones	E flat below Low C High C 34 half tones	D below Low C A above Middle C 32 half tones	B flat or B below Low C
	VII	G below Low C F above High C 35 half tones	G below Low C F above High C 35 half tones	G below Low C E above High C 34 half tones	E flat above Low C
	VIII	F below Low C D above High C 34 half tones	F below Low C C# above High C 33 half tones	G below Low C E above High C 34 half tones	Low C or D flat above Low C

*In each cell in Columns 2, 3, and 4, the first designation is of lowest pitch phonated, the second designation is of highest pitch phonated, and the third designation is of the number of half-tones comprising the total range including falsetto.

Where there was a difference in the results obtained, it was never more than one-half tone for this test; and a recheck located the disputed pitch right between recorded results in two instances (i.e., between High C and High C sharp, for example).

Discussion.--An examination of the results obtained in pitch range determination indicates that five out of the eight subjects showed a decrease in vocal range in the second interview and an increase in range at the third interview. Although the extent of change was not large (sometimes no more than one-half tone) in some cases, these changes did exist. It is also true that the five subjects showing this pattern included all members of the experimental group. All three subjects violating this pattern were members of the control group, playing minor roles in Marat/Sade. Furthermore, one of the three (Subject VI) violated this pattern not by failing to show a range decrease at the second interview but by showing yet another decrease at the third interview. The other two subjects exhibited a pitch range which remained the same from the first interview to the second rather than showing any decrease. These findings seem to indicate that the voice, even if only slightly fatigued because of heavy quantitative use, may react by showing a decrease in the pitch range which it is capable of phonating, even in the absence of other vocal symptoms.

Once again in these tests, Subject II who had the most substantial voice and speech and vocal music training exhibited evidence of that training; he had a pitch range considerably greater than that of any other subject tested. However, two observations can be made indicating possible

deficiencies in his vocal training. First, when he encountered serious vocal difficulties during the week of production, the voice range showed considerable reduction. From the 42 or 43 half tones he was capable of producing, he could produce only 36 at the time of the second interview. This reduction may be a function of either the extent of the range to begin with or the severity of the voice problem he was having at the time of the second interview. Second, Subject II exhibited a consistent tendency to push his voice at the limits of his vocal range in each register. Before leaving head register to enter falsetto, he consistently sang the last few half tones with excessive force. Similarly, the last few notes (i.e., the highest notes) in the falsetto range were sung using excessive loudness. This practice contradicts the advice given in a number of voice textbooks; and in the opinion of a number of authors, it is symptomatic of functional misuse.[5] Although it is also true that indirect laryngoscopic examination at the first interview revealed some organic aberration in the case of Subject II (see Table 17), his tendency to force his voice at the limits of each register is classically symptomatic of functional misuse of the voice.

Habitual Pitch for Reading, Speaking, and Characterization

Results.--Tables 10 and 11 summarize the data obtained at all interviews regarding habitual pitch during reading and speaking. Table 10 contains data obtained by evaluators listening to various samples and

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[5]See, for example, Punt, The Singer's and Actor's Throat, p. 26; and Fröschels and Jellinek, Practice of Voice and Speech Therapy, p. 201.

selecting the most frequently recurring pitch level used in each, whereas Table 11 summarizes results obtained by evaluating each subject as he depressed inflections to a monotone while both speaking and reading. Data are based on results obtained by three evaluators conducting their analyses independently.

A comparison of the results obtained showed fairly good agreement among evaluators, although this agreement was not as consistent as it was for the results obtained in the vocal range analyses. The results summarized in Tables 10 and 11 represent a synthesis of individual findings. Where differences of opinion did occur, they seldom exceeded one full tone in extent; such differences were resolved by using the modal pitch wherever possible and the median pitch otherwise.

TABLE 10

HABITUAL PITCH FOR READING AND SPEAKING--DETERMINED BY LISTENING

	SUBJECT	FIRST INTERVIEW		SECOND INTERVIEW		THIRD INTERVIEW	
		READING	SPEECH	READING	SPEECH	READING	SPEECH
EXPERIMENTAL	I	E*	E flat	E flat	E flat	E flat	E flat
	II	B flat	A flat	A	A	B flat	A flat
	III	B flat	B	A	B flat	A	B flat
	IV	A flat	G flat	A flat	G flat	A flat	G
CONTROL	V	B flat	B flat	Low C	A flat	B	A flat
	VI	A flat	B flat	A	A flat	A flat	A
	VII	B flat	B flat	A	B	A	B flat
	VIII	A flat	A flat	A flat	G	A flat	A

*Except where otherwise indicated, all pitches are located between one octave below Middle C and two octaves below Middle C. In other words, all pitches fall between 128 and 64 c.p.s.

TABLE 11

HABITUAL PITCH FOR READING AND SPEAKING--DEPRESSING TO A MONOTONE

	SUBJECT	FIRST INTERVIEW		SECOND INTERVIEW		THIRD INTERVIEW	
		READING	SPEECH	READING	SPEECH	READING	SPEECH
EXPERIMENTAL	I	E flat*	E flat	D flat	D flat	E flat	D flat
	II	B flat	A flat	B flat	A flat	A flat	G flat
	III	D flat**	G flat	A flat	A flat	B flat	A
	IV	G	G flat	G flat	G flat	G flat	A flat
CONTROL	V	Low C	A	B flat	G	A	A flat
	VI	A flat	A flat	A flat	A flat	G flat	A flat
	VII	A	B flat	B flat	B flat	B	A
	VIII	A flat	G flat	A flat	A flat	B flat	A flat

*Except where otherwise indicated, all pitches are located between one octave below Middle C and two octaves below Middle C. In other words, all pitches fall between 128 and 64 c.p.s.

**Above Low C.

A comparison of Tables 10 and 11 indicates that the relationship between results obtained via these respective methods was quite good. With two exceptions, the results obtained never varied more than one full tone on the musical scale even though, for speaking at least, the same material was not repeated by the subjects while depressing inflections to a monotone. The two exceptions were both only one and one-half tones apart and were for the same subject (III). It is worthwhile to note here in passing that this subject seemed to habitually use the greatest amount of pitch variety in both reading and speaking of all eight subjects.

An examination of Tables 10 and 11 indicates no marked habitual pitch change in any of the subjects from one interview to the next, although minor variations did occur. It must therefore be assumed that either:

1) functional voice problems did not occur in any of the subjects, 2) the functional problems which did occur were not serious enough to produce the anticipated lowering of habitual pitch, or 3) the lowering of habitual pitch is not a valid indication of the presence of a functional voice problem in male actors. Results obtained in other vocal tests tend to favor the second or third alternatives, as does information provided by both the case histories and the indirect laryngoscopic examinations.

Habitual pitch for characterization was determined by listening to each of three selections read in character by each subject at the second interview. The researcher made all these determinations and was spot-checked by two consultants working independently. Although results were not absolutely consistent, once again agreement was generally good among evaluators. In order to provide the reader with some indication of the extent of this agreement, results obtained independently by all three evaluators have been included in Table 12. An habitual pitch for each reading was determined by selecting the modal pitch where possible and the median pitch otherwise. Habitual pitch for each characterization was determined by selecting the median pitch in each series of three selections read by the same subject. If every word spoken by any particular character during an entire play were included in the computation, the result might be quite different from the pitches called habitual for characterization in this study. However, the data actually available for analysis for each characterization is fairly represented in the present computation. Table 12 lists habitual pitches for each of the three selections and the overall habitual pitch assigned to each characterization. At this point, it is of value to compare optimum pitch with

TABLE 12

HABITUAL PITCH FOR CHARACTERIZATION

	SUBJECT	FIRST SELECTION	SECOND SELECTION	THIRD SELECTION	HABITUAL PITCH FOR CHARACTERIZATION
EXPERIMENTAL	I	F# below Low C* B below Low C B below Low C B below Low C	G below Low C	F below Low C	G below Low C
	II	E above Low C E flat above Low C E flat above Low C E flat above Low C	Low C	F above Low C	E flat above Low C
	III	F above Low C and Middle C D above Low C and B above Low C B flat above Low C E above Low C and B flat above Low C	Middle C	B above Low C	B above Low C
	IV	E above Low C F above Low C F above Low C F above Low C	A flat above Low C	Middle C	A flat above Low C

CONTROL	V	F above Low C D above Low C D flat above Low C D above Low C	E above Low C D flat above Low C Low C D flat above Low C	B flat above Low C B flat above Low C Middle C B flat above Low C	D above Low C
	VI	A flat above Low C G above Low C A above Low C A flat above Low C	F above Low C E flat above Low C E flat above Low C E flat above Low C	D above Middle C D flat above Middle C D flat above Middle C D flat above Middle C	A flat above Low C
	VII	G above Low C G above Low C F above Low C G above Low C	E above Low C D above Low C Low C D above Low C	G above Low C F above Low C F above Low C F above Low C	F above Low C
	VIII	E above Low C Low C Low C Low C	B flat below Low C Low C B flat below Low C B flat below Low C	F above Low C G above Low C F above Low C F above Low C	Low C

*Where four pitches are listed in any one cell, the first three indicate the pitches perceived by individual judges and the fourth represents the pitch considered most representative of their combined individual results.

habitual pitch during reading, speaking, and characterization. Table 13 represents a summary of this comparison. Optimum pitches were determined on the basis of data obtained at the first interview for each subject (see Table 9, page 133). Habitual pitches for reading, speaking, and characterization were determined on the basis of data obtained at the second interview for each subject (see Tables 10, 11, and 12). The comparison of pitches summarized in Table 13, on the following page, reveals a number of different relationships. To begin with, every subject had a habitual pitch for both reading and speaking which was lower than his optimum pitch. This was not true, however, of habitual pitch for characterization. Two of the subjects (II and VIII) had habitual pitches for characterization which were the same as their optimum pitches, and three others (I, V, and VII) deviated from optimum pitch when reading in character by no more than one full tone. The three remaining subjects (III, IV, and VI) deviated far more substantially from their optimum pitches while reading in character, all in an upward direction.

Discussion.--There are a number of possible explanations for the relationship revealed between optimum pitch and habitual pitch for characterization. It could be conjectured, for example, that the five subjects exhibiting a strong similarity between optimum pitch and habitual pitch for characterization had either an instinctive or a learned concept of what their best voice pitches felt or sounded like. This conjecture might explain their employment of that pitch when "acting" but not when reading a uniform passage or when speaking conversationally. These subjects might have been using their voices more efficiently than the others. However,

TABLE 13

COMPARISON OF OPTIMUM PITCH WITH HABITUAL PITCH FOR READING, SPEAKING, AND CHARACTERIZATION

	SUBJECT	OPTIMUM PITCH (COMPUTED)	HABITUAL PITCH		
			READING	SPEAKING	CHARACTERIZATION
EXPERIMENTAL	I	A flat or A below Low C	D flat or E flat below Low C	D flat or E flat below Low C	G below Low C
	II	D or E flat above Low C	A or B flat below Low C	A or A flat below Low C	E flat above Low C
	III	D flat above Low C	A or A flat below Low C	A flat or B flat below Low C	B above Low C
	IV	Low C	A flat or G flat below Low C	G flat below Low C	A flat above Low C
CONTROL	V	D flat above Low C	Low C or B flat below Low C	A flat or G below Low C	D above Low C
	VI	B flat or B below Low C	A or A flat below Low C	A flat below Low C	A flat above Low C
	VII	E flat above Low C	A or B flat below Low C	B or B flat below Low C	F above Low C
	VIII	Low C or D flat above Low C	A flat below Low C	G or A flat below Low C	Low C

the same results might be looked at differently and so indicate that Subjects III, IV, and VI were vocally the most imaginative and flexible actors in the group. Or, perhaps psychological factors made Subjects III, IV, and VI most tense about "performance" situations. In any case, the degree of pitch alteration exhibited by these subjects would tend to rule out simple chance.

Voice Quality for Reading and Speaking

Results.--Analysis by a panel of twenty judges revealed that changes in perceived voice quality followed no consistent pattern among subjects or for the group as a whole. Tables 14 and 15 summarize the results obtained when the judges' evaluations were compiled. Each judge was asked to listen to three consecutive (although randomly ordered) samples of each subject speaking or reading and to rank these samples, 1 for best voice quality, 2 for average voice quality, and 3 for worst voice quality. Individual scores were totalled and recorded on Tables 14 and 15, respectively. In these tables, the best score a subject could be assigned for any one performance was therefore 20 and the worst score was 60. The lower the score, the better the voice quality perceived by the judges; the higher the score, the poorer the perceived voice quality. In addition, on these tables if a majority of judges checked a particular voice quality deficiency on their rating sheets, this problem was noted in the cell representing the interview at which that problem was identified. An examination of Tables 14 and 15 indicates the following: when rank orders assigned by each judge were combined, the resultant composite ratings tended to reveal no clearly discernible trends for the group as

TABLE 14

QUALITY EVALUATION BY PANEL OF JUDGES:
COMPOSITE SCORES FOR UNIFORM READING SELECTION*

	SUBJECT	FIRST INTERVIEW	SECOND INTERVIEW	THIRD INTERVIEW
EXPERIMENTAL	I	39	50	32
	II	30	50	35
	III	40	34	44
	IV	38	34	45
CONTROL	V	48	43	48
	VI	42	49 Husky Quality	43 Husky Quality
	VII	31	43	54 Harsh Quality
	VIII	36	36	54

*20=All twenty judges evaluated voice quality as best.
60=All twenty judges evaluated voice quality as worst.

TABLE 15

QUALITY EVALUATION BY PANEL OF JUDGES:
COMPOSITE SCORES FOR CONVERSATIONAL SPEECH*

	SUBJECT	FIRST INTERVIEW	SECOND INTERVIEW	THIRD INTERVIEW
EXPERIMENTAL	I	40	45	42
	II	40	43	34
	III	32	46	41
	IV	40	36	35
CONTROL	V	52 Hypernasal	44 Hypernasal	32 Hypernasal
	VI	43 Husky Quality	51	47
	VII	39	34	48
	VIII	40	40	41

*20=All twenty judges evaluated voice quality as best.
60=All twenty judges evaluated voice quality as worst.

a whole or for either subgroup. Furthermore, evaluations of the same subject for reading and speaking were most often inconsistent. This lack of consistency in the judges evaluations of the subjects' voice quality[6] may indicate that the subjects actually used their voices somewhat differently while reading than they did while speaking conversationally. The researcher's subjective response during the actual data collection would tend to support this possibility.[7]

Discussion.-- In addition to the lack of consistency between evaluations of the reading samples and speaking samples for seven out of eight subjects, there was a lack of consistency in the voice quality alterations perceived in the group as a whole. It is true that when the results of both tables are combined, more judgments of "worst voice quality" were made in connection with data obtained at the second interview than at either of the other two. However, the differences in actual score appear to be too small in some instances to rule out chance. It must therefore be concluded that, despite interesting individual exceptions to the overall trend, there was a lack of consistently perceivable voice quality

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[6]In all but one case; for Subject VI, judgments were consistent.

[7]The researcher perceived a sense of performance while the subjects read aloud. While speaking conversationally, however, many of them relaxed, let down their guards, seemed more themselves. This is a subjective reaction to be sure, but the disparities between evaluations for reading and speaking just might be the result of this occurrence. In speaking conversationally at the second interview, four of the eight subjects were judged to be using their worst voice quality and three out of those four were members of the experimental group. Generalizations based on these somewhat inconclusive results can be dangerous, but there is at least some possibility that further studies might reveal the speaking voice to be a better measure of voice quality in actors than the reading voice.

alteration in the group as a whole from either the first interview to the second or from the second interview to the third. The most substantial trend is revealed when only Table 15 is considered and attention is focussed on the voice quality change occurring from the second to the third interviews. In six out of eight subjects (including all members of the experimental group), the judges perceived a quality improvement from the second interview to the third. The two exceptions to this pattern were one subject (VII) who had some voice difficulties connected with singing in performance right before the third interview (see p. 165) and one subject (VIII) whose voice quality remained virtually unchanged, according to the judges, during the entire course of the study.

Vocal Characteristics During Characterization

At the time of the quality evaluations, the panel of judges was also asked to describe, with the help of a checklist, the vocal characteristics of each of the characters being portrayed by the actors participating in the study. Upon listening to one long reading from the play performed in character by each member of the experimental group and to three short readings from the play performed in character by each member of the control group, the judges described the vocal characteristics they perceived.

Results.--A summary of the judges' observations is found in Table 16 on the following page. In this table, adjectives appear in each cell only when a majority of judges (i.e., a minimum of eleven) checked these adjectives on the evaluation forms provided (see Appendix A-IX).

TABLE 16

VOCAL CHARACTERISTICS DURING CHARACTERIZATION

	SUBJECT	CHARACTER	RATE	LOUDNESS	PITCH	QUALITY
EXPERIMENTAL	I	Duperret (erotomaniac)	medium	medium	low to medium*	husky, although rather nondescript
	II	Marquis de Sade (sane; political prisoner)	medium (effective)	medium (effective)	medium (effective)	rich and full
	III	Jean-Paul Marat (paranoiac)	medium to fast	medium to loud (effective)	high	hypernasal
	IV	Jacques Roux (manic-depressive)	medium	medium to loud	medium	harsh and somewhat denasal
CONTROL	V	Inmate (also musician)	medium	medium	medium to high	generally nondescript, although somewhat hypernasal
	VI	Inmate (severely retarded; mental age of 12)	fast	medium	high	generally nondescript, although somewhat husky
	VII	Inmate (severe catatonic)	medium to fast	loud	medium to high	harsh
	VIII	Inmate (schizophrenic)	medium	medium	medium to high (monotonous)	hypernasal

*Where two adjectives appear in the same cell, judges were divided in their opinions.

Discussion.--A comparison of the voice quality perceived by the judges for characterization with voice quality perceived during reading or speech reveals that every one of the subjects altered his voice to some extent for purposes of characterization. As a matter of fact, Table 16 reveals a frequent and widespread perception by the judges of alterations made by the subjects in all vocal characteristics and particularly in voice quality. The actual effects of these changes on the voices and physical conditions of the subjects was revealed more consistently by the indirect laryngoscopic examinations and by the case histories taken at the second and third interviews than by major differences in performance on many of the vocal tests administered.

Indirect Laryngoscopic Examination

Results.--Results obtained from the indirect laryngoscopic examinations performed on all eight subjects indicated that the condition of the throat varies greatly and is related not only to misuse of the voice but to a number of other factors as well. These results are summarized in Table 17.

At the first set of examinations, only one subject (V) was found to have a throat and larynx which was completely normal, although two others (I and IV) had only a very minor problem -- post-nasal drip. Four of the other subjects (III, VI, VII, and VIII) came into rehearsal already exhibiting some possible signs of vocal misuse, and Subject II evidenced an organic abnormality of the larynx of which he had been entirely

TABLE 17

SUMMARY OF LARYNGOLOGICAL EXAMINATION REPORTS

	SUBJECT	FIRST EXAMINATION	SECOND EXAMINATION	THIRD EXAMINATION
EXPERIMENTAL	I	post-nasal drip	cords off-white and slightly edetamous	red throat, post-nasal drip, slightly edetamous cords
	II	granulated pharynx, post-nasal drip, left cord crosses over midline during phonation	red pharynx, post-nasal drip, cords pink in color, incomplete adduction, mucous deposits, both cords edetamous, edges of cords blunt; bowing in middle of cords and overcompensation by left cord	red pharynx, mild edema of blunt-edged vocal cords; left cord overcompensates past midline during phonation
	III	post-nasal drip, red, granulated pharynx--due to mild strain or a respiratory infection	right cord off-white, some mucous deposits; right cord somewhat edetamous	completely normal larynx
	IV	post-nasal drip	completely normal larynx	completely normal larynx
CONTROL	V	completely normal larynx	completely normal larynx	red throat; post-nasal drip
	VI	naso-pharynx irritated, post-nasal drip, blood vessels visible on vocal cords due to strain; false cords edetamous	bowing of both cords upon phonation	visible blood vessels due to strain; weak adduction of the vocal cords
	VII	completely normal larynx except for somewhat edetamous false vocal cords due to strain	post-nasal drip	red throat, post-nasal drip
	VIII	some mucous deposits on vocal cords with thickened edges due to abuse	completely normal larynx	completely normal larynx

unaware.[8] The physician performing all of the indirect laryngoscopic examinations found Subjects II, III, and VI relatively difficult to examine with a laryngeal mirror; this can be regarded as symptomatic of functional misuse of the voice (see pp. 53-54).

The second and third laryngeal examinations served to justify the predictive value of the initial examination (see pp. 54, 56) in Subjects II, III, IV, V, and VI. Subjects I, VII, and VII, however, exhibited either laryngeal symptoms or the lack of laryngeal symptoms which were not predictable on the basis of the initial laryngeal examination.

Discussion.--It is most productive to discuss the significance of laryngeal pathologies encountered in the present study by relating them to laryngological research on one hand and to relevant case history information provided by the subjects on the other hand.

For example, the examining physician observed an asymmetry in the larynx of Subject II at the initial interview. For some reason, the right fold was not travelling far enough to meet the left vocal fold at the midline of the glottis during phonation. The left vocal fold was compensating for this failure by crossing beyond the midline to meet the right fold and thereby effect phonation. Laryngologists have observed that structural aberrations which remain undetected or seem insignificant in a

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[8]This finding points up the limitations of the case history questionnaire as diagnostic methodology. Because the subject was unaware of his organic abnormality, so was the researcher--until the laryngological examination revealed it. It is therefore important to treat these methodological techniques as complementary to one another in voice research.

child's larynx may become important later in life as the cause of a voice defect. Since these minor aberrations are likely to be observed only after vocal difficulties have occurred, it is quite difficult to determine whether they were congenital or originated some time after birth in any particular case.[9]

Minor deviations in the bilateral development of the larynx are actually seen quite frequently in laryngological practice. However, the importance of developmental irregularities is somewhat controversial. Patients are often seen with pronounced obliqueness of the glottis but quite normal voices, and some authors believe that most often such differences have little influence on the quality of the voice.[10] However, other authors have stated that vocal difficulties are particularly to be expected when the vocal cords are affected in any way. They believe that any asymmetry in the physical properties of the vocal folds must affect the acoustical qualities of the voice.[11]

In the particular case of Subject II, it is most probable that the asymmetry in the alignment of the vocal folds was either congenital or occurred during pubescence. This asymmetry

> . . . is quite capable of predisposing the voice to functional difficulty. The myasthenia laryngis occurring at the time of the second examination and the subsequent return to "normality" by the third examination can be regarded as solid verification of both organic and functional involvement in the syndrome.[12]

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[9]Moore, "Voice Disorders Organically Based," p. 552.

[10]See, for example, Brodnitz, Vocal Rehabilitation, p. 102.

[11]Luchsinger and Arnold, Voice--Speech--Language, p. 168.

[12]F. S. Brodnitz, private interview held during meeting of the Speech Association of America Convention in New York City, December 28, 1969.

Extensive training in both voice and speech and vocal music seemed to enable Subject II to manipulate his voice effectively even when the organic problem was at its worst--two weeks before production and during the week of production. However, Subject II did have a previous history of complete voice loss, did in fact lose his voice entirely during rehearsals for the production (see Production Log) and during the week of production itself, and exhibited strong symptomology of myasthenia laryngis at the time of the second laryngeal examination. Both the appearance of the larynx and the vocal difficulties the subject was having at that time led the consulting physician to strongly recommend two weeks of complete vocal rest for the subject following the close of Marat/Sade. Subject II had been committed to go immediately into rehearsal for two other productions as soon as Marat/Sade closed, but he dropped out of them on the physician's advice. Despite a one-week bout of influenza which followed the production and which involved some potentially damaging deep chest coughing, the larynx was well on its way back to "normal" by the time of the third examination.

This brings up the question of the value of voice rest for the patient suffering from the results of functional voice misuse. Subjects III and VI showed some minor evidence of voice strain in otherwise normal larynges even at the time of the first examination; by the week of production, the condition of both larynges had worsened considerably as the vocal demands caused by their participation in Marat/Sade increased with a geographical relocation of rehearsals to an auditorium and with a lengthening of actual time spent in rehearsal as opening night grew closer. Subjects II and III rested their voices considerably following the closing

of Marat/Sade, whereas Subject VI moved immediately from Marat/Sade to rehearsals for three different student productions in which he was cast. As a probable result, Subjects II and III showed organic improvement at the time of the third examination, whereas Subject VI showed further deterioration in the physical condition of the larynx and in a number of vocal characteristics, deterioration which might be attributed to lack of rest or continued misuse of the voice in performance (see Tables 6, 7, 8, 9, and 17).

The value of voice rest alone has been challenged by a number of specialists in voice pathology.[13] Brodnitz and a number of others sharing his beliefs feel that the functional disorder is extremely likely to return despite voice rest as soon as the patient resumes his faulty habits of phonation--unless retraining of the voice is incorporated into treatment. Other specialists, however, feel that stringently controlled voice rest is essential, because the affected muscles must be allowed to recover from damage previously done before any kind of retraining can be undertaken. Even then, some believe, the fact that retraining the voice is dependent on the exercise of the same muscles which have been severely debilitated by previous misuse makes prognosis particularly poor in cases of myasthenia laryngis.[14]

Although it is true that good voice training might help to prevent the occurrence of myasthenia laryngis or even less serious functionally

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[13]See, for example, Brodnitz, Vocal Rehabilitation, p. 73.

[14]Jackson and Jackson, Diseases of the Nose, Throat, and Ear, pp. 626-627.

caused voice problems in actors, such training is not currently available, at least not on any wide scale. It is also true that although many actors may misuse their voices in rehearsals and performances of a production with enough consistency to cause either discomfort or vocal symptoms of the resulting organic involvement, often they do not do so in their normal or everyday voice use as well. Therefore, given a limited run and an understanding of the underlying principles, it would seem that voice rest would be of some value for these actors during the time when the heaviest production demands are made on their voices.

Subject II may have been the only one of the eight with an asymmetry of the larynx, but he was not the only one whose larynx underwent organic change during the course of the present study. As a matter of fact, three of the four members of the experimental group and one of the four members of the control group exhibited a deterioration in organic condition of the larynx at the time of the second examination. Furthermore, these subjects either showed an improvement in that organic condition by the time of the third examination two weeks later, or presented supportive data justifying their failure to improve. This fact is even more significant if the failure of the other four subjects (IV, V, VII, and VIII) to conform to this pattern can be explained--and, at least to an extent, this is possible.

The case of Subject IV is particularly interesting. If indeed it is true that the quantitative and qualitative demands of playing a major role in a production without the benefit of extensive voice training will produce symptomology of functional voice problems in the male actor, such symptomology should probably have appeared in Subject IV at the time of

the second examination. This did not prove to be the case, for at least two important reasons. First of all, there is evidence in the literature that certain individuals are physically or psychologically far less prone than others to vocal fold abnormalities or voice difficulties. For example, in discussing the occurrence of vocal nodules and polyps, Arnold has attributed inherent resistance to individuals having particular body types, personality types, and laryngeal appearance.[15] The fact has already been discussed that what constitutes abuse for one individual produces no negative effects whatsoever in others; there are individual differences in the ability to tolerate quantitative or qualitative demands made on the speaking voice (see pp. 35-36).[16]

A second possible factor in Subject IV's lack of major vocal or physiological difficulties was discovered during the compiling of the second case history. When questioned about problems involving any dryness of the mouth, the subject revealed that he did have this problem when working in the straitjacket his role required. However, he had discovered that the action of chewing would relieve the dryness by actually lubricating the oral cavity and throat. Further questioning revealed that the subject apparently had no previous knowledge of Emil Froeschels or of the concept of chewing therapy, but he had actually discovered it out of a

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[15]Arnold, "Vocal Nodules and Polyps," pp. 205-206.

[16]As a matter of fact, Subject IV did not even rest his voice after the close of Marat/Sade but went straight from it into rehearsal for a production of Little Mary Sunshine, in which he played his particular character by relying heavily on his falsetto range. Despite this use and the fact that he had what he described as a bad cold from the time Marat/Sade closed until the time of the third interview, his larynx and throat appeared completely normal at that time.

physiological need for oral lubrication and was using it on a regular basis in connection with this production.

Chewing therapy has been used mainly in Europe but with increasing frequency in this country in the correction of functional voice disorders. Froeschels, in discussing its value, has remarked that "It is amazing how a hyperfunctional voice changes immediately into a free and normal one. . . . The method, therefore, is one which can be used to avoid certain severe troubles of the voice, in other words, as a hygienic measure."[17] Schmitz-Svevo actually showed that dryness of the throat and of the oral cavity disappears if the patient chews or even if he thinks of chewing.[18] A number of other authors have discussed the values of chewing therapy as well.[19] With such enthusiastic praise and solid support for the values of this system, it provides an excellent justification for the lack of physical or vocal symptoms of functional misuse in an actor employing it.

The most convenient explanation for the failure of Subjects V, VII, and VIII to conform to a pattern of physical deterioration at the second interview followed by physical improvement at the third interview would be to attribute this failure to the relative lack of quantitative vocal demands made on their voices by the production. Certainly this fact

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[17]Froeschels, "Hygiene of the Voice," pp. 154, 156.

[18]Federica Schmitz-Svevo, "Chewing Method Applied in Cases of Pharyngeal Dryness of Organic or Psychogenic Origin," Journal of Speech Disorders, VI (December, 1941), 185-186.

[19]See, for example, Brodnitz, Vocal Rehabilitation, pp. 80, 81.

should not be ignored, but the fact that Subject VI did encounter both functional and organic difficulties makes further explanation necessary. It is true that Subject VI showed a propensity for functional misuse of the voice as early as the first laryngeal examination, but so did Subjects VII and VIII. It is also true that Subject VI used a pitch much higher than his optimum for characterization, but so did Subjects III and IV (see Table 13). Subject III showed organic symptoms of functional involvement as a result, whereas Subject IV's failure to do so has already been discussed (see pp. 154-156). Perhaps then this use of a pitch much higher than optimum for characterization was an important factor in the symptoms developed by both Subject III and Subject IV.

There is no apparent explanation for the laryngeal observations in the case of Subject VIII. He was neither ill nor, to his knowledge, did he make undue demands upon his voice at the time of the first laryngeal examination; yet, that is when his throat and larynx appeared worst to the eye of the examining physician. Subject VII's examination results can be explained, however. The case history taken at his preliminary interview revealed that this subject had been suffering from chronic asthmatic bronchitis for at least one year (see Table 3). The respiratory symptoms of this disease are in many ways quite similar to those of asthma, which Greene has described as follows:

> The voice of the asthmatic is generally breathy and wheezy, being a combination of laryngeal and respiratory symptoms. The laryngeal mucosa may be slightly congested as a reaction to allergy or continual coughing up of broncial mucous. A real vocal strain may be present in patients who use their voices considerably and be the result of functional disorder in its fullest sense. [Italics mine.][20]

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[20]Greene, The Voice and Its Disorders, p. 94.

Subject VII exhibited symptoms of chronic asthmatic bronchitis throughout the present study. He described himself as a heavy cougher,[21] and he was dependent on both daily medication and breathing exercises each morning to control the chronic congestion. As a matter of fact, data collected from Subject VII during the course of this study were affected by not only this chronic condition but also by an acute case of strep throat. He contracted this during the week of final dress rehearsals and the first few days of performance and had to be hospitalized for a few days as a result (see Production Log). Subject VII also suffered a mild relapse during the two weeks between the second and third sets of interviews. To further complicate matters, he had rehearsed and sung in an eighteen-man chorus during this time, a situation which he felt had put his voice into even worse condition than it had been during the run of Marat/Sade. The laryngoscopic findings in his case seem no longer atypical when these factors are considered.

Actual Vocal Demands Stemming from Participation In Marat/Sade

When the present study was organized, subjects were divided into an experimental group and a control group, according to the roles in which they had been cast in Marat/Sade (see pp. 80-81). Determination of which actors had been cast in the four most vocally demanding roles in the show and of which actors, as inmates, would be playing relatively undemanding roles, was made on the basis of anticipated characterizations.

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[21]The physical effects of heavy coughing on the larynx are quite similar to the effects of vocal abuse (see p. 41).

However, because no production of any play is ever quite the same as any other, a variable which revealed itself once Marat/Sade was actually mounted at Michigan State University was its actual vocal and physical demands on its actors, as opposed to the demands which had been anticipated.

Results.--In Table 18, both number of lines spoken and number of lines sung have been calculated for each character.[22] The actual number of lines spoken by each actor is a bit difficult to pinpoint because of the amount of crowd responses and choral work inherent in the script itself. In the figures which follow, especially for the four inmates, numbers are at best reasonable approximations and might vary among individuals due to the particular demands of their characterizations.

Table 18 also includes materials relating to the demands of the particular roles other than the number of lines. The play's director was asked to make two rankings. In the first, he ranked the roles played by the actors in the play from one (greatest demands placed on the voice) to eight (fewest demands). In other words, the director began by ranking the roles themselves independent of the way in which they happened to be cast or interpreted. In the second, the director ranked the roles from one (greatest demands placed on the voice) to eight (fewest demands) in terms of the particular actors' interpretations and characterizations

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[22]The present study has defined a line as a word or a group of words beginning with a capital letter and ending with some form of punctuation or with space on the page to indicate the completion of a poetic line.

TABLE 18

SIZE OF ROLE PLAYED AND DEMANDS OF THAT ROLE ON EACH ACTOR

	SUBJECT	NUMBER OF LINES SPOKEN	NUMBER OF LINES SUNG	VOCAL DEMANDS ORIGINATING FROM ROLE	VOCAL DEMANDS ORIGINATING FROM INTERPRETATION BY EACH ACTOR
EXPERIMENTAL	I (Duperret)	108	15	4	6
	II (de Sade)	410	12	3	2
	III (Marat)	456	0	2	1
	IV (Jacques Roux)	137	32	1	3
CONTROL	V (Inmate-Musician)	63*	0*	8	8
	VI (Inmate-Retarded)	63*	55*	5	5
	VII (Inmate-Catatonic)	62*	55*	5	7
	VIII (Inmate-Schizophrenic)	62*	55*	5	4

*Approximately

in those roles. Criteria employed in this regard included factors such as amount of shouting or screaming, amount of loudness employed, verbal or vocal participation on an improvisational basis in rehearsal and performance (when retained), participation in choral vocal reactions, and even the amount of physical activity. Results of both rankings have been incorporated into Table 18.

Discussion.--An examination of the number of lines and of the vocal and physical demands placed on each actor by this particular production of Marat/Sade revealed almost as much variation within each sub-group as there was between the experimental group and the control group. This information is of extreme importance to the accurate interpretation of the data collected in the present study. It indicates at least two vital facts. In the first place, as is so often the case in the theatre, the vocal demands which had been anticipated for each actor because of the role in which he had been cast did not ultimately coincide with the actual vocal demands which each actor placed on himself by his particular interpretation of that role. Only Subjects V and VI performed in a manner which was totally consistent with anticipated demands; all the other subjects deviated in differing degrees from anticipated demands. Of greatest interest in this respect are Subjects I and IV, both of whom exerted themselves less than the director had anticipated, Subject I considerably so.

In addition, Subject V in particular and Subject VII to an extent did rather minimal vocal work during the production. Subject V was relied upon heavily to supply musical accompaniment throughout the production. Because of this, he participated in none of the group singing and in less

group vocal work as an inmate than did any of the others. Subject VII just happened to evolve a characterization which was quite catatonic in nature. As such, he spent a lot of his onstage time immobile, transfixed, and certainly not participating in as many of the activities physically or vocally as did Subjects VI and VIII, although he was considerably more involved more of the time than was Subject V.

The second relevant fact is related to the actual number of lines spoken or sung. An examination of Table 18 indicates that the most precise division of the eight subjects into major actor and minor actor sub-groups would have been into four groups rather than two. Marat and de Sade, with by far the greatest number of lines and greatest demands placed on them vocally, would form one sub-group. The second would be composed of Jacques Roux and Duperret, with far fewer lines and fewer real vocal demands placed on their voices by their interpretations of their characters than either Marat or de Sade. The third sub-group would consist of Subjects VI and VIII, who participated actively in their minor roles; and the fourth sub-group would consist of Subjects V and VII, whose vocal involvement in the production was relatively minimal.

Therefore, despite expectations to the contrary, the present study was not ultimately strongly based on the observation of a clearly definable experimental group and a clearly definable control group.

Subsequent Case History Information

The final contributions to the present study were made by the case histories taken at the second and third interviews for each subject. The most important information supplied by the subjects at these times

dealt with their participation in other activities or productions during the course of the data collection, and with their fluctuations in health during the course of the study.

Results.--Case history information obtained from each subject at the second and third interviews revealed that, during the course of the data collection: 1) a number of subjects were concurrently involved in production other than Marat/Sade, and 2) a number of subjects contracted colds or flu or other respiratory infections, which could not help but influence their vocal performance.

Subject I, for example, suffered a bad cold from the time Marat/Sade closed until the time of the third interview. Furthermore, during these two weeks, he was in rehearsal and performance for two student productions. At the time of the third interview, he was taking medication for a sore throat and a cough. Subject II encountered complete voice loss on at least three occasions during the rehearsal period and the week of production of Marat/Sade. He was using a great deal of medication by the time of the production. Immediately following it, he had a one-week bout of flu with heavy coughing and sore throat. Furthermore, he was in rehearsal for a student production of Staircase, which had two performances two weeks before Marat/Sade opened; entries in the Production Log indicate that the subject was unable to participate in rehearsals for Marat/Sade on the two performance dates for Staircase because his voice was "gone." Enrollment in an acting course during the entire period of data collection made even further demands on his voice.

Subject III felt that he had misused and strained his voice right at the beginning of rehearsals for Marat/Sade, a fact which could explain some of the laryngeal findings obtained at the time of the first interview (see Table 17). Aside from his participation in an advanced acting course, there were no other demands placed on his voice during the course of the study; and he was able to rest his voice immediately following production before the third set of interviews. Subject IV, in addition to his participation in Marat/Sade, was in rehearsals and performances of Staircase up to two weeks before the week of production. Throughout the study, he was using his voice in both a television production course and an advanced acting course. Immediately following the close of Marat/Sade, the subject developed a bad head cold, which he still had at the time of the third set of interviews. Although he was taking medication for the cold, he was not able to rest his voice at all; five days after Marat/Sade closed, Subject IV began rehearsals for a production of Little Mary Sunshine. Furthermore, he was playing his role in that production using his falsetto range.

Subject V believed he had a cold and sore throat at the time of the second interview, although his voice "sounded the same" to him. He was involved in no other concurrent productions or outside activities which would place further demands on his voice. Subject VI went into rehearsal for a student production even before Marat/Sade opened. A week after Marat/Sade closed, he developed a bad cold which he still had at the third interview. By that time, he was into rehearsals and performances for three student productions; his voice was hoarse, his throat was sore, and he had been "losing his voice on and off all week." He was constantly

troubled by excessive phlegm on the vocal folds, and he felt that his voice was tiring easily. It was therefore within more than reasonable expectation that Subject VI showed the worst symptoms of functional voice problems at his third interview rather than at his second.

Subject VII was troubled by chronic congestion and cough; phlegm was a daily problem, and singing always caused him throat discomfort. During the week of production, he was hospitalized for a severe case of strep throat with asthmatic complications. He was on heavy medication and found the singing demanded by his participation in Marat/Sade particularly wearing on his throat; he felt he was losing his voice. The primary infection had cleared up by the time of the third interview; but he still felt as though he had a cold, and he was still under medication. Despite his illness, he had rehearsed for and sung in three ten-minute concerts of an eighteen-man chorus on campus. He found that he could perform only by resting his voice extensively between concerts; and he was feeling throat soreness and vocal weakness at the time of the third interview, weakness which he attributed "definitely" to his singing activities.

Subject VIII, between the first and second interviews, had experienced "a couple of sore throats." At the time of the second interview, he was coughing and his throat felt sore. His voice and health had both improved by the third interview, in his opinion, despite the fact that he was in rehearsal for four student productions by that time.

Needless to say, both participation in productions other than Marat/Sade and fluctuations in state of health during the data collection must be considered in the final analysis of that data for all subjects; both health and amount of voice use are quite likely to affect performance

on the vocal tests administered during the present study.

It is also important to reiterate here that a secondary purpose of this study, as stated in Chapter I, was to discover the specfic problems inherent in experimental research in the actor's use of voice. When this has been accomplished, a projective methodology for future research could be evolved. Results have therefore been presented and discussed in detail in this chapter so that future researchers might benefit from such detail. However, the primary purpose of the present study was to investigate the relationship between the manner in which an actor alters his voice for purposes of characterization and the effects of those alterations on the speaking voice itself. In order to fully appreciate the complexity and implications of the many relationships involved in such an investigation, it is essential that they be summarized at this stage.

Summary and Discussion of Combined Results

Representing the relationships among the large quantities of collected data by placing them into tabulated form proved quite productive. This tabulated summary enabled the researcher to achieve an overview of the manner in which various results obtained in the study could be related to one another for purposes of increasing understanding. This summary is presented in Table 19.

Categories of data collected are listed along both the vertical and the horizontal axes of the table. Within the cells located where any two columns intersect are numbers which represent the subjects who fit into the respective categories. The presence of a zero within a cell indicates that no subject evidenced the relationship represented by the intersection

of columns. In Table 19, results have been indicated only where considered both important and related to this study; a dash has therefore been used to indicate the omission of data relationships considered unimportant or irrelevant.

Table 19 summarizes some relationships that have already been reported in this chapter. In addition, other relationships were revealed by this juxtaposition of data, relationships which vary from the simple to the complex. A few examples should serve to provide some indication of this variation: 1) The smokers reacted far more dramatically as a group to the demands placed on their voices by participation in production than did the non-smokers. Whether this fact represents a cause and effect relationship cannot be determined at this time. 2) The same subjects who showed a lessening of maximum duration of phonation when vocal demands were the greatest also showed a concurrent shortening of range. Moreover, most of these subjects showed a worsening of both voice quality and condition of the larynx when vocal demands were greatest. 3) Both subjects having a history of chronic respiratory infections evidenced their worst breathing efficiency when the demands placed on their voices were greatest. However, neither subject showed a change in breathing location during characterization, a lessening of either duration or range, or a deterioration of either quality or laryngeal appearance at that time. These findings might be a function of the history of respiratory infections common to both subjects or mere coincidence.

The possibility of further comparisons is great, but not all of the relationships revealed in Table 19 are of direct relevance to this study. Table 19 has been reproduced here in the hopes that it might be of value

TABLE 19

SUMMARY OF RELATIONSHIPS AMONG COLLECTED DATA

VARIABLES	Cigarette Smoker	Hist. Resp. Infec.	Acting Experience	Acting Training	Voice Training	Med. Problems at First Interview	Med. Problems at Second Interview	Med. Problems at Third Interview	Other Productions at Second Interview	Other Productions at Third Interview	Char. Pitch Differed Signif. from Optimum	Changed Location of Breath. dur. Charac.	Dura. of Phon. Least when Demands Greatest	Range Smallest when Demands on Voice Gr.	Br. Effic. Worst when Demands Most	Quality Worst when Demands Greatest	Laryn. Condit. Worst when Demands Greatest	Demanding Role Played in Marat/Sade
Cigarette Smoker	1,2 3,6	0	-	-	2	-	-	-	-	-	-	1,2 3,6	1,2 3,6	1,2 3,6	1,3	1,2 3,6	1,2 3,6	-
Hist. Resp. Infection		5,7	-	-	-	7	5,7	7	-	-	-	0	0	0	5,7	0	0	-
Acting Experience			1,2 3,4	1,2 3,4	2	-	-	-	-	-	3,4	1,2 3,4	-	-	-	-	-	1,2 3,4
Acting Training				1,2 3,4 8	2	-	-	-	-	-	3,4	1,2 3,4	-	-	-	-	-	1,2 3,4
Voice Training					2	-	-	-	-	-	0	2	2	2	0	2	2	-
Medical Problems at First Interview						7	7	7	-	-	-	-	-	-	-	-	-	-
Medical Problems at Second Interview							2,5 7,8	7	2,8	-	-	-	-	-	-	-	-	-
Medical Problems at Third Interview								1,4 6,7	-	1,4 6,7	-	-	-	-	-	-	-	-
Other Productions at Second Interview									2,4 6,8	4,6 8	-	-	-	-	-	-	-	-
Other Productions at Third Interview										1,4 6,7 8	-	-	1,6 8	1,4 6,8	1,7	1,6	1,3	-
Char. Pitch Differed Signif. from Optimum											3,4 6	3,4 6	-	-	-	-	3,6	3,4
Changed Location of Breath. dur. Charac.												1,2 3,4 6	1,2 3,6	- -	1,3	-	-	1,2 3,4
Dura. of Phon. Least when Demands Greatest													1,2 3,6 8	1,2 3,6 8	1,3	1,2 3,6	1,2 3,6	1,2 3
Range Smallest when Demands on Voice Gr.														1,2 3,4 6,8	1,3	1,2 3,6	1,2 3,6	1,2 3,4
Brea. Effic. Worst when Demands Greatest															1,3 5,7	1,3	1,3	1,3
Quality Worst when Demands Greatest																1,2 3,6	1,2 3,6	1,2 3
Laryn. Condit. Worst when Demands Greatest																	1,2 3,6	1,2 3
Demanding Role Played in Marat/Sade																		1,2 3,4

in the initiation of new and better studies in this field. However, the purposes of the present study can best be served by a discussion of the relationships revealed which are of direct import to the vocal performance of the actor during production. In order to discuss these relationships in an orderly manner, the most important of them will be presented individually and sequentially.

Previous Voice and Music Training.--Since only Subject II had voice and music training worthy of serious consideration, it is somewhat unfair to compare results obtained in his tests with those obtained for all other subjects. However, it is worthy to note that he had what was by far the most extensive pitch range of all the subjects. Furthermore, he used a habitual pitch for characterization which corresponded precisely with his optimum pitch. In addition, he was able to produce voice quality described as "rich and full" by a panel of judges even when he was suffering acute myasthenia laryngis.

However, other test results revealed that his considerable training did not prevent his maximum duration of phonation from decreasing, his pitch range from sharply decreasing, his conversational voice quality from worsening, or the physical condition of his larynx from deteriorating when his voice was under its heaviest usage. A number of these factors might serve as valid indications of the relative merit of various systems of voice training in future studies.

This study also revealed that the subjects using vocal warm-ups during rehearsals and before performances of Marat/Sade nevertheless developed functional voice problems during times of heaviest voice usage

(see Table 5). Therefore, it would seem that the actual warm-up techniques employed by these subjects were either incorrect or inadequate.

Indirect Laryngoscopic Examination.--Seven out of the eight subjects had vocal symptoms of functional problems--decrease in pitch range or in maximum duration of phonation or in breathing efficiency, etc.--at the same time they had physical symptoms. Furthermore, four out of the five subjects showing relatively serious organic involvement at some point or points in the study evidenced correspondingly serious vocal symptoms such as a comparatively large reduction in range, a decrease in duration of phonation, lessening of breathing efficiency, or a deterioration of vocal quality used for speaking.

Case histories compiled at all three interviews indicated some inconsistencies between subjects' descriptions of the condition of their throats and larynges and actual physical condition as determined by indirect laryngoscopic examination. Three of the four members of the experimental group had fairly accurate ideas of the actual condition of the throat and larynx at the time of each examination, and the fourth (Subject IV) evidenced organic change far too minimal to make his failure to do so important. However, all four members of the control group were unable to assess the condition of their throats and larynges accurately at the time of all three examinations. This inability may be a reflection of the fact that laryngologists have frequently observed differences between the condition of a larynx and the patient's description of his problem or the sound of his voice (see p. 51). On the other hand, failure in this group might be a function of its comparative lack of both acting

training and acting experience, with the self-knowledge which they can bring to an individual actor.

Location of Major Breathing Activity.--Results obtained in the present study seem to indicate that the fact that an actor changes his major location of muscular breathing activity for purposes of characterization may be a result of previous acting experience or training and a contributing factor to the occurrence of functional voice problems. The three subjects showing no change in breathing location were all playing minor roles in Marat/Sade, had only minimal changes in vocal range during the course of the data collection, and used habitual pitches for characterization which were either the same or deviated by no more than one full tone from their optimum pitches. The five subjects showing some change in location of major breathing activity included all four members of the experimental group. This group had greater changes in extent of pitch range during the course of the data collection than the other group, and included all three subjects whose habitual pitch for characterization deviated sharply in an upward direction from their respective optimum pitches. A majority of these subjects also showed a decrease in the duration of phonation and a deterioration in laryngeal condition under heaviest vocal usage. Conceivably then, a tendency to change major location of muscular activity during breathing for purposes of characterization could be an indication of a tendency to functionally misuse the voice. On the other hand, treating the locating of major breathing activity as a variable for purposes of characterization may be the result of more extensive acting experience on the part of these five subjects.

Breathing Efficiency, Hard Glottal Attack, and Habitual Rate.--More often than not, an increase in the number of breaths needed by each subject to get through a uniform reading selection accompanied other symptoms of functional voice problems in the actor. Most often, the difference in the number of breaths was a very small one. However, there was an increase in the number of breaths needed and a worsening in the condition of the vocal mechanism as vocal demands increased--and a decrease in the number of breaths was observed as conditions improved--in seven out of the eight subjects. Subject IV, who was the only one to deviate from this pattern, remained generally consistent throughout the course of the data collection. This occurrence may be a function of more hygienic voice usage on his part (see pp. 155-156).

The use of hard glottal attack in both reading and characterization did not prove a consistent indication of the presence or the absence of a functional voice problem. No pattern emerged to indicate that the use of hard glottal attack is anything more than a function of habit unaffected by the presence or absence of voice problems. Existing literature has already revealed that excessive use of glottal attack is frequently observed in individuals evidencing hypertense phonation patterns (see p. 101). However, results obtained in this study did not indicate that the number of hard glottal attacks increases as the result of the acquisition of a functional voice difficulty.

Reading rate at different interviews did not fluctuate with enough consistency or to a great enough extent to be considered a factor which could indicate the presence or absence of functional voice problems. However, habitual rate for characterization was considerably lower in all

subjects than their habitual reading rates. Furthermore, there was a decrease in habitual rate for characterization in seven out of the eight subjects between the beginning of the rehearsal period and the week of production. These observations would seem to indicate both a difference between the dynamics contributing to each of these rates and a contribution made by the process of rehearsal which serves to decrease habitual rate for characterization in the actor.

Pitch Range and Habitual Pitch.--In seven out of the eight subjects, a reduction in range accompanied an increase in demands made on the voice by participation in Marat/Sade or in other productions and activities necessitating other than conversational use of the voice (acting classes, singing in chorus, etc.). The other subject (V) was involved in Marat/Sade more as a musician than as a vocal participant and even his range increased after the demands placed on his voice by the production ceased. Therefore, range appears to be an extremely good indicator of the relative condition of the vocal mechanism of the actor. Furthermore, the extent of change in pitch range may very well be an indication of the extent of change in the condition of the vocal mechanism; three of the four subjects showing a loss of three half-tones or more at the second interview had concurrently pathological larynges.

The ability of a subject to use a habitual pitch for characterization which is the same as or within one full tone of his optimum pitch does not seem to insure against the occurrence of functional voice problems. Five of the eight subjects were found to be using a habitual pitch for characterization which was the same as or corresponded very closely to

their optimum pitches. Nevertheless, at least two of these subjects encountered functional difficulties. Furthermore, although two of the three actors using a habitual pitch for characterization which deviated greatly from their optimum pitch did encounter some vocal problems, the third subject did not. Therefore, use of a pitch for characterization which is the same as or extremely close to optimum pitch does not seem to be able to insure the male actor against the occurrence of functional voice problems.

Changes in Voice Quality.--In this study, deterioration of voice quality as perceived by a panel of judges did not consistently indicate functional voice problems. The judges identified voice quality as being worst when a laryngologist evaluated the condition of the vocal mechanism as worst for only three out of the eight subjects. Because three other subjects experienced so little change in physical condition of the larynx during the course of the study, however, only Subjects III and VIII need be considered notable exceptions to this trend. However, lack of consistency between quality evaluations made for reading and for conversational speech was evident for seven out of eight subjects. Furthermore, some subjects showed only minimal quality differences between interviews. Therefore, results obtained in this particular area were very inconclusive.

The way in which an actor alters his vocal characteristics for purposes of characterization does not seem to be related to the occurrence of functional problems. For example, Subject I made his voice husky for purposes of characterization, whereas Subject III made his voice fast in

rate, loud in volume, high in pitch, and nasal in quality; yet, both of them exhibited somewhat similar physical and vocal symptoms of abuse at the time of the second interview--a decrease in the maximum duration of phonation, a reduction in pitch range, a decrease in breathing efficiency, a deterioration in habitual quality for conversational speech, and a discoloration of the vocal folds. On the other hand, Subject IV made his voice loud, harsh, and denasal for purposes of characterization, whereas Subject V simply relied on his habitually high-pitched and nasal voice; nevertheless, these subjects shared an absence of a number of symptoms of functional voice problems (Neither suffered a decrease in breathing efficiency or in duration of phonation. Neither suffered a deterioration in voice quality for reading or speaking. Neither showed physical symptoms of abnormality at the time of the second interview on the basis of an indirect laryngoscopy.). Therefore, the type of alterations which an actor induces in his voice for purposes of characterization does not seem to have any direct relationship to the type or extent of voice problems which he may encounter.

Size and Demands of Roles Portrayed.--The actual size of the role in number of lines and the extent of vocal and physical demands seem to contribute to the presence or absence of vocal problems in a number of different ways. The presence of major problems in Subjects I, II, and III and the absence of major problems in Subjects V, VII, and VIII would support a relationship between actual size of role and extent of vocal and physical demands and the occurrence of functional problems. However, the reversal of this pattern in Subjects IV and VI indicates that type of voice

usage by the actor is also a contributor the presence or absence of voice problems. In any case, it is worthy to note that the major actors playing the most vocally demanding parts and the two inmates playing somewhat vocally demanding parts consistently showed more symptoms of functional voice problems than did the other members of their respective sub-groups. However, the lack of clearly discernible and consistent differences between the experimental group and the control group would tend to indicate one of two things: either the differences in vocal demands made on the sub-groups themselves were not great enough to cause a difference in results obtained, or the amount or extent of vocal demands was not instrumental in precipitating the occurrence of vocal problems.

Production Log.--The director of this production was not particularly "vocally-oriented." As a result, he did not provide voice coaching for the actors which would prevent them from forcing their voices or yelling, nor did he make them aware of personal vocal deficiencies or possible hygienic measures. Therefore, the production log turned out to be more valuable as a documentation of voice difficulties encountered by the subjects during the process of rehearsal than as a record of directorial contributions to the presence or absence of functional voice difficulties in the actors.

Selective Analysis of Combined Results

Thus far, Chapter IV has presented specific results obtained through the analysis of large groups of data. Within this body of results, certain findings emerge as being of primary importance to the overall

purpose of this study. These findings tend to group themselves into four basic areas: Causes of Functional Voice Problems in the Male Actor, Symptoms of Functional Voice Problems in the Male Actor, The Actor's Use of Voice for Characterization, and The Relation of Vocal Hygiene to Functional Problems in the Male Actor.

Causes of Functional Voice Problems in the Male Actor.--The present study seems to indicate that there are at least four factors which may contribute to the occurrence of functional voice problems in the male actor:

1) a change (usually to high chest or clavicular) in the location of major muscular activity for breathing during characterization;

2) an upward deviation of the habitual pitch used for characterization from the actor's computed optimum pitch;

3) the extent of performance demands upon the actor's voice;

4) the use of voice in rehearsals and performances during respiratory infections.

Symptoms of Functional Voice Problems in the Male Actor.--In this study, the presence of functional voice problems in the male actor seems to be most consistently symptomized by:

1) a reduction in breathing efficiency;

2) a reduction in maximum duration of phonation;

3) a reduction of pitch range;

4) a deterioration in the physical condition of the larynx.

However, the presence of functional voice problems in the male actor seems not to be symptomized by either a lowering of habitual pitch for reading or

conversational speech or a deterioration of voice quality as evaluated by a panel of judges.

Actor's Use of Voice for Characterization.--A number of findings revealed the specific nature of the actor's use of voice for purposes of characterization:

1) Habitual rate for characterization in all eight subjects was consistently lower than habitual rate for reading;

2) Habitual rate for characterization decreased in seven out of the eight subjects from the beginning of the rehearsal period to the time of production;

3) Habitual pitch for reading and speaking was lower than computed optimum pitch for all eight subjects.

4) Habitual pitch for characterization was the same as or within one full tone of computed optimum pitch for five subjects, and noticeably higher than computed optimum pitch for the other three.

5) The ability of an actor to use a habitual pitch for characterization which is the same as or within one full note of his optimum pitch does not seem to insure against the occurrence of functional voice problems.

6) The particular way in which an actor alters his vocal characteristics for purposes of characterization does not seem to be related in a consistent manner to the occurrence of functional voice problems.

7) The fact that an actor changes his location of major muscular activity during breathing for purposes of characterization may be a function of his acting training or acting experience.

Relation of Vocal Hygiene to Functional Problems in the Male Actor.--An examination of a number of principles of vocal hygiene and the effects of performance on the actors voice revealed that:

1) The smokers experienced more vocal difficulties as a group because of the performance demands made on their voices than did the non-smokers;

2) The use of individually styled warm-ups did not seem to provide consistent insurance against the occurrence of functional voice problems in the male actor;

3) Vocal rest seems to be effective in eliminating a number of the symptoms of functional problems in the male actor.

Many of the findings outlined here seem worthy of further research and investigation. More specific discussion of implications for such research follows in the final chapter of this study.

CHAPTER V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS FOR FUTURE RESEARCH

Up to the time of this study, research and opinions offered by specialists in speech pathology, medicine, music, psychology, and theatre were available only through a number of different sources and had not, in the vast majority of cases, been organized with the actor in focal point. Although the need for information regarding the actor's voice was and is still great, such research and qualified opinion were scattered, contradictory, and incomplete. The present study was undertaken in the hope of beginning to fill some important gaps. Perhaps it has been even more successful in its direction than in its actual content. Although, as a descriptive study, it has not provided any empirically validated answers, it may have succeeded in asking many of the right questions. Therefore, its chief value may very well be heuristic: it has 1) shown that research can be focussed around the actor's voice in relation to performance, 2) indicated how much further research is needed, and 3) hopefully begun to lay the foundation for some of that research.

The purpose of this final chapter has been briefly stated as an overall summary of the study itself, an interpretation of the results obtained, and a discussion of the implications of both the actual study and its results for future voice research.

Summary

An investigation of the actor's voice in relation to his participation in production was conducted in order to serve two basic purposes. Its primary purpose was to answer a number of basic questions relating to vocal characterization, namely:

1) In what respects and to what extent does an actor alter his vocal characteristics for purposes of public performance or characterization?

2) What effects do such voice alterations have on the condition of the actor's throat, larynx, and voice?

3) Is there a relationship among: vocal training, acting experience, the demands of a particular characterization; and the nature and severity of any voice problems occurring during the course of the preparation and production of a full-length show?

Its secondary purpose was to investigate the possibility of extablishing a basis and a methodology which could be applied in future research on the actor's voice.

Methodology.--The methodology for the present study centered around a series of examinations and interviews conducted in conjunction with the Michigan State University Performing Arts Company production of Marat/Sade. Eight actors in this production, four of whom were playing the most demanding roles and four of whom were cast as inmates, were questioned, tested, and physically examined at the beginning of the rehearsal period, during the week of production, and two weeks after the show had closed. At each interview, data were collected which were subsequently analyzed to determine medical, educational, and vocational history for each subject. In addition, the physical condition of the throat and larynx was ascertained, and an evaluation of the following vocal characteristics was

made: breathing efficiency, use of hard glottal attack, habitual reading rate and pitch, voice quality, location of major breathing activity, extent of tension or relaxation, maximum duration of phonation, and pitch range. Readings from the script of Marat/Sade were also analyzed in order to determine breathing efficiency, use of hard glottal attack, habitual reading rate and pitch, voice quality, and location of major breathing activity for each actor during characterization. Data obtained at all twenty-four interviews were tabulated and compared by the researcher with the help of two voice specialists and a panel of twenty judges from the Department of Audiology and Speech Sciences at Michigan State University. Master tapes were made in order to facilitate various analyses of data; individual samples on each tape were randomized in order to maximize objectivity in various analyses (see Table 1).

Because this was conceived as a descriptive study, the empirical validity and reliability of its hypotheses were never fully ascertained. However, analysis of collected data did enable the researcher to obtain a number of results.

Results.--Results obtained in the present study have been individually discussed in Chapter IV. In this summary, for purposes of greater clarity, they have been divided into three general areas: 1) the ways in which the actor alters his voice during characterization; 2) possible causes of functional voice problems in the male actor; and, 3) symptoms of functional voice problems in the male actor.

The present study succeeded in revealing a number of differences between the habitual speaking voices of the actors and the voices which they

used during characterization:

1) All of the actors altered their voices in one or more of the following ways during characterization: change in habitual pitch, rate, or loudness; change in voice quality; and change in location of major breathing activity.

2) All eight subjects used a habitual pitch for reading and speaking throughout the study which was lower than their computed optimum pitches, seven considerably so. However, during characterization, two subjects used habitual pitches which were the same as their optimum pitches and three more deviated from their optimum pitches by no more than one full tone. The three remaining subjects deviated more substantially from their optimum pitches during characterization, all in an upward direction.

3) The process of rehearsal was related to a noticeable decrease in the habitual rate for characterization, regardless of the size of type of role being played, in all but one subject.

No direct relationship could be established between the extent and type of voice alterations made by the actor during characterization and the extent and type of functional voice problems encountered. At least one actor whose voice was under heavy usage did not develop serious symptoms of functional voice misuse, whereas one actor whose voice was under far less performance usage did develop such symptoms. This fact would seem to indicate that the relationship was dependent upon more factors than the size of the role portrayed. Such factors appear to include:

1) Possible Predisposing Factors: the majority of subjects showing organic symptoms of functional misuse as early as the first interview encountered further difficulties during the course of the study. The majority of subjects showing few or no organic symptoms during the first interview encountered fewer symptoms during the course of the data collection. The smokers experienced more vocal difficulties during the time of heavy production demands on their voices than did the non-smokers in the present study.

2) Location of Major Breathing Activity: three of the four subjects switching into clavicular breathing during characterization had a high incidence of symptoms of functional voice problems when their voices were getting maximum performance usage.

3) Vocal Misuse During Performance: three subjects showed improvement in both the physical condition of the larynx and vocal performance when they had an opportunity to rest their voices following the close of Marat/Sade. Another subject was in relatively serious vocal trouble at the time of production but got no voice rest between that time and the third set of interviews two weeks later. This subject showed a further deterioration in the physical condition of the throat and larynx and exhibited vocal symptoms of functional misuse as well. These results tend to indicate a relationship between misuse of the voice during performance and the occurrence of functional voice problems in the male actor.

Finally, this study revealed that a number of occurrences may be symptomatic of the beginnings or the presence of functional voice problems in the male actor:

1) A small but observable decrease in breathing efficiency as measured in number of breaths needed to get through the oral reading of a uniform selection was directly related to other symptoms of functional voice problems in five of the eight subjects.

2) In four out of the eight subjects, a decrease in maximum duration of phonation accompanied other symptoms of functional voice problems. Only minor differences in duration occurred in most of these cases, however.

3) Although the difference was only one-half tone in some instances, all of the subjects evidenced some change in pitch range during the course of the data collection--a decrease as demands made on their performing voices increased, or an increase as demands made on their performing voices decreased. In addition, three of the four actors having the greatest demands made on their voices evidenced a greater extent of change in range than did the members of the control group.

4) This study revealed no measurable alteration in either habitual pitch or voice quality for reading or speaking as the demands made on the performing voice increased or decreased or in the presence or absence of other symptoms of functional voice problems.

Conclusions

Analysis of results obtained led to a number of conclusions related to the original questions and hypotheses which were the basis of this study. These conclusions might conceivably be validated by future

empirical research. They are selectively discussed here according to the order in which the questions and hypotheses were originally stated in Chapter I.

Questions.--The three questions originally stated in Chapter I have been answered by the present study as follows:

1) It seems quite possible to determine both quantitatively and qualitatively in what respects and to what extent the actor alters his vocal characteristics for purposes of performing publically or creating a particular characterization.

2) Voice alterations induced for purposes of characterization may affect both the physical condition of the actor's vocal mechanism and the characteristics of his voice.

3) If there is a relationship between previous vocal training, previous acting experience, the demands of a particular characterization, and the presence, the nature, and the severity of any objectively measurable voice problems occurring during the course of the preparation and production of a full-length show; then this relationship is a very complex one, which was not made explicit by the methodology of the present study.

Hypotheses.--Most of the hypotheses as originally stated in Chapter I proved to be generally sound. However, some of them must now be qualified somewhat on the basis of the results obtained in this study.

For example, this study succeeded in showing that there is a demonstrable relationship between the demands of a specific characterization and the possibility of functional voice problems in the male actor and that this relationship was directly affected by the basic physical condition of the actor's vocal mechanism. However, the efficiency or lack of efficiency with which an actor habitually uses his voice proved more

difficult to assess than was originally anticipated.[1] Therefore, a relationship could not be demonstrated between such efficiency and the occurrence of functional voice problems as a result of the demands of characterization.

The type and extent of vocal alterations induced for purposes of characterization seems to be related to the occurrence of functional voice problems in the male actor. This relationship is a complex one and varies from one individual to another. A number of factors which might affect such a relationship were revealed in the present study, including a change (usually to high chest or clavicular) in the location of major muscular activity for breathing during characterization and the use of voice in rehearsals and performances during respiratory infection. The use of a pitch for characterization which differed greatly from the optimum pitch did not consistently foster the occurrence of functional voice problems, nor did the use of pitch for characterization close to or the same as optimum pitch insure against their occurrence. The kind and extent of quality alteration induced by the actor did not seem to have a direct relationship to the type and extent of functional voice difficulties he encountered either; once more, individual differences seemed more instrumental than particular artistic choice.

An actor's history of voice or music training and his previous acting training and experience did not prove to be directly related to the

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[1]Neither the more efficient breathers nor those in the group using habitual pitches for characterization closer to their computed optimum pitches fared noticeably better than the other subjects in the avoidance of functional voice problems, for example.

presence, the nature, and the severity of any functional voice problems. Because of differences in constitutional factors, personal habits, and involvement in other performance activities, the occurrence of functional voice problems in the participants could not be predicted with absolute certainty but only recorded as having occurred.

On the basis of this study, it could be further concluded that generally, the greater the demands of a particular characterization on the voice of an actor who is untrained or inadequately trained vocally, the greater will be the likelihood of potential functional voice problems. However, the relationship is more complicated than a simple matter of quantity; the manner in which the actor employs his voice for characterization is also an important factor in his acquisition or avoidance of functional voice problems. If and when the performance demands placed on the actor's voice are lessened or eliminated, it seems as if both the physical condition of his vocal mechanism and the characteristics of his own voice improve (i.e., return toward normalcy).

Finally, certain symptoms of functional voice problems seemed to be more directly related than others to the male actor. The presence of functional voice problems in the male actor seemed to be most consistently symptomized by a reduction in maximum duration of phonation, a decrease in the number of half tones comprising the vocal pitch range, and a deterioration in the physical condition of the larynx. However, the presence of functional voice problems in the male actor seemed not to be symptomized by a lowering of habitual pitch for reading or conversational speech, a deterioration of voice quality as evaluated by a panel of judges, or a change in the number of hard glottal attacks used by the actor when reading aloud.

Implications for Future Research

Hopefully, future research in this area will resolve some of the questions left unanswered by the present study. In this regard, repetition of a study similar to this one on another production or with female subjects would be quite valuable. If such a study were to be undertaken, the following methodological changes might improve the accuracy or reliability of the results:

1) loudness might be made a variable rather than controlled throughout the data collection, in order to ascertain whether force is a key determinant in the presence or absence of the occurrence of functional voice difficulties;

2) participation in all productions except for the one in which all the subjects have been cast in common should be strictly forbidden, so that positive findings could be attributed definitely to an actor's extent and type of participation in the development of one specific characterization;

3) a production should be selected in which there is as striking a difference in the size of the roles and vocal demands as possible between the experimental group and the control group in order to determine as precisely as possible the effects of both role size and vocal demands on the voice of the actor;

4) more effective methodology is needed for evaluating quality changes in the non-clinical voice. It would also be useful to ascertain whether judges can more accurately evaluate voice quality in actors from spontaneous conversational speech samples than from reading samples;

5) the present methodology should be modified into an empirical study in order to scientifically validate the relationship between a decrease in breathing efficiency, a decrease in maximum duration of phonation, and the presence of functional voice problems in the male actor. Empirical methodology might also reveal certain other relationships which the present study did not succeed in identifying.

Further research is also indicated by some of the results obtained in the present study. Firstly, the difference between the rate results

achieved in Goates' study[2] and this one would seem to necessitate further research in order to resolve the seeming disparity. Secondly, a study is needed of the actor's use of breathing for dramatic effect; it is important to his future training to ascertain the relationship between breathing location and efficiency and the occurrence of functional voice problems. Thirdly, an investigation is needed of the relationship between a director's knowledge of and insistence upon good voice production and a lack of functional voice problems in the male actor.

This study has also raised a number of questions worthy of research in future studies. The most important of these questions may be the most general: What are the essential ingredients of a good voice training program for the actor? and What are the most effective methods of achieving maximum flexibility, durability, and creativity in the actor's use of voice? In a very important article about retraining the damaged voice, Briess has stated that vocal abuse is virtually unavoidable today, especially for professional voice users. He therefore concluded that no therapy can be considered complete without a phase designed to widen abuse tolerance. In his opinion, all muscles must be overtreated so that they can withstand abuse. The patient must also learn to feel hyperfunction in laryngeal muscles due to abuse or emotional factors, so that he can prevent serious damage from occurring.[3] Future research relating to the use of

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[2]Goates, "Pitch Changes in Actors," p. 49. Goates reported that actors' rates for characterization increased during the process of rehearsal, whereas in the present study there was a considerable decrease in the rates of seven out of eight subjects.

[3]F. Bertram Briess, "Voice Therapy, Part II: Essential Treatment Phases of Specific Laryngeal Muscle Disfunction," A.M.A. Archives of Otolaryngology, LXIX (January, 1959), 68.

such overtreatment with special regard to the actor could be invaluable to the success of his professional work.

It would be equally useful to determine whether a reliable way could be found to assess the relative merits of various systems presently used to train the actor's voice.[4] The set of criteria eventually evolved for such an assessment must include the absence of organic evidence of functional misuse of the voice and the lack of deterioration in range, breathing efficiency, and quality even under the strain of heavy performance usage of the actor's voice. It might also prove valuable to ascertain whether any training, even if it were in some ways deficient, is of greater benefit to the performing actor than no voice training at all.

More specific questions relating to voice training include the following:

1) Can specialized training prepare an actor for the demands of a particular role or theatre? Can intensive general training prepare an actor for the vocal demands of any role he may be asked to play in any theatre? Lessac believes so; it would be of great value to establish a solid scientific basis for his opinion that artificial or even unnatural use of the voice can be practiced without fear of damaging the vocal mechanism once basic kinesthetic controls are established.[5]

2) A number of practicing voice specialists believe strongly in the value of a vocal warm-up before performance. Further research is needed in order to determine whether the use of such a warm-up would indeed enable the actor's voice to function more efficiently. If this proves to be the case, the basic ingredients of such a performance warm-up would then have to be determined.

3) Is the location of major breathing activity important? Most specialists are of the opinion that any breathing location is acceptable except for clavicular breathing. If this is true,

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[4]The Warren Method and the Lessac System are two major examples.

[5]Lessac, The Use and Training of the Human Voice, pp. xvii-xviii.

must the actor avoid clavicular breathing during characterization at the risk of damaging his own vocal mechanism?

4) Are there techniques of physical relaxation which can be used effectively by the actor while in performance in order to improve his voice production or to avoid hypertense phonation? In other words, can the actor be trained to channel his tensions or to eliminate harmful tension which could otherwise interfere with effective voice usage?

5) Is the relationship between voice and emotion an immutable one, or can it be controlled by the actor so that he in turn can retain control over his voice and vocal characteristics without sacrificing believability?

6) What constitutes projection? Can the actor be trained to project his voice in such a way as to bypass or eliminate any need for force in the process?

7) Are there cues the actor can use to monitor his voice which are reliable even during colds, fatigue, or respiratory infections?

The Need for More Complete Understanding

In order for these questions to be answered, intensive research is needed. And yet, voice training in this country is treated as if the answers to many of these questions were proven fact rather than "folklore" or educated conjecture. Voice research is still in its embryonic stages with regard to the special problems of the actor; yet, the need for special pre-professional and in-service voice training are very great right now. Despite a widespread and immediate critical need for answers to both philosophic and curricular questions, more experimentation is needed on functional voice problems and on relationships between them and the demands of performance on the voice of the actor before an "ideal" voice training sequence for actors can be evolved.

To isolate just one example, a practice which medical specialists have emphasized quite strongly, the pre-professional voice

analysis,[6] is by no means common practice in our training institutions. An actor must be fully prepared to rely on his voice in order to earn his living for the rest of his professional life; yet, most young actors never consult a medical throat specialist until something has gone seriously wrong with that voice, by which time it is often too late. The thought of how many young actors could be better trained or even directed into different areas of performance because of potentially serious voice problems is staggering. So often, training--because it is in some way deficient or too taxing on an inadequate mechanism--is responsible for serious voice difficulties which could have been minimized or perhaps even prevented by an initial screening and examination.

A final area of direct importance to future voice training for the actor in this country is the training of specialists to handle this multi-faceted responsibility. At the present time, there is a paucity of well-trained and qualified theatre voice specialists. Although there are a number of excellent exceptions to be found, many teachers of theatre speech and voice "fell into" their jobs in order to fill a need, rather than being systematically trained for a profession. Some are retired actors, having no specific training in voice other than their own experience, whereas others are simply speech teachers who have decided to specialize by working with young actors in university theatre programs. Speech pathologists who work with actors tend to minimize the importance of sub-clinical vocal symptoms and lack the theatre background and knowledge to provide the actor with sound, professionally useful advice.

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[6]Brodnitz, Keep Your Voice Healthy, pp. 64-65.

On the other hand, many theatre people specializing in voice have invaluable knowledge of the actor's professional needs but lack good clinical background and therefore frequently fail to recognize or diagnose symptoms of functional misuse. Speech clinicians approach their classwork with actors as a matter of retraining the damaged voice rather than creatively training the good voice, whereas theatre specialists regard many voices as normal which actually need corrective retraining before creative training should be undertaken.

The training of theatre voice and speech specialists is of vital importance to the future of actor training in this country. The voice therapist who decides to specialize in work with actors must have solid artistic training and background, a real understanding of the professional vocal needs and working conditions of the actor. The professional actor will strenuously object to advice which may be quite sound clinically but which is contradictory to the style or needs of a specific role or production. The voice specialist also needs a better than average speaking voice which is virtually free of substandardisms or regionalisms. This may seem an overstatement of the obvious at first glance, but actors are frequently quite dismayed at the voice and diction of the specialists whom they have consulted for professional assistance.

The voice specialist must also have an accurate idea of the standards which the actor is seeking to attain. If, as a speech pathologist, his vocal frame of reference is limited to a group of abnormal voices, communication with an actor seeking to improve or eliminate what seem like non-problems in an already attractive and somewhat flexible voice will be difficult and non-productive.

The theatre specialist seeking to train the actor vocally must combine the best of his artistic and creative abilities with a solid foundation in anatomy and physiology, principles of dynamic relaxation and balanced activity, and clinical voice pathology. Once a voice has succumbed to bad treatment, it cannot be restored by either rest alone or conventional voice teaching. To expect those who have been trained solely in theatre or music to be able to diagnose and treat complicated mechanical malfunction in a highly complex vocal apparatus is unreasonable. On the other hand, the attempt to diagnose and treat malfunction in tone production by observing the action of the vocal cords via indirect laryngoscopy is also quite inadequate.[7] Ideally then, the training of specialists for work with actors would incorporate contributions from voice pathology, laryngeal medicine, psychology, music, and theatre.

A synthesis of these contributions, so rare in voice teachers currently practicing, is not difficult once two things have been accomplished: 1) the scientific foundation must be laid and the preliminary organization completed; and, 2) interested and qualified individuals who are willing to train their own voices, bodies, and intellects before teaching others to do so must be located and brought together for that purpose.

Murphy, in an excellent text on functional voice disorders, has described what he believes to be the ideal voice clinician; his definition needs be expanded and amended ever so slightly in order to make it an ideal definition of the teacher of voice technique for actors as well:

> The voice clinician then, may be a speech pathologist certified by the American Speech and Hearing Association, a laryngologist with

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[7]Zerffi, "Voice Reeducation," p. 526.

a special interest and training in vocal rehabilitation, or a specially trained singing teacher. Perhaps the ideal voice clinician would be a speech pathologist with training in psychiatry who was also a competent otolaryngologist with a good musical ear and background. Yet even this wouldn't be quite enough unless he were also something special as a human being. He would have to be inquisitive, acceptant and creative, vital, honest with self and others, and not opinionated. He would be devoted to the process rather than the act, to the person rather than the part-function. He would have to be authoritative when the situation demanded and permissive at other times. He would need to be attentive without being overaffectionate, sociable without being unduly familiar, professionally committed but personally interested. There would have to be love in him but no need for the case's love. He would need to be objectively problem-oriented but subjectively person-oriented. Holding up hope, he must also point out limitations. He would keep studying the developments in his field and he would keep working at his own evolution toward becoming something more than he is, both as a clinician and as a person. As a professional individual he exists for the patient. And to the patient, without ever verbalizing it, or perhaps without ever realizing it, he conveys this thought: "I have in my mind an image of what you can become."[8]

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[8]Murphy, Functional Voice Disorders, pp. 123-124.

APPENDICES

APPENDIX A

FORMS USED IN COLLECTION AND ANALYSIS OF DATA

A-I. Case History Questionnaire--First Interview

A-II. Case History Questionnaire--Second Interview

A-III. Case History Questionnaire--Third Interview

A-IV. Examiner's Checklist--Breathing Location and Physical Tension

A-V. Physician's Checklist--Indirect Laryngoscopic Examinations

A-VI. Procedural Outline--First Interview

A-VII. Procedural Outline--Second Interview

A-VIII. Procedural Outline--Third Interview

A-IX. Judges' Information and Voice Evaluation Forms

A-I. Case History Questionnaire--First Interview*

I. General Information

Name:_____

Address:_____

Phone Number:_____ Date of Examination:_____ Time:_____

Date of Birth:_____ Age:_____Sex:_____

Marital State:_____

Occupation:_____

II. Family History

	Father	Mother	Sibling	Sibling	Sibling	Grand-parents	Spouse
Name:							
Age:							
Nationality:							
Education:							
Occupation:							
Health:							
Speech Defects:							
Physical Defects:							
Nervous Disorders:							
Smoking:							
Marital History:							

*All case history questionnaires were completed by the examiner while interviewing the subjects. The questionnaires were adapted from Van Riper, Speech Correction: Principles and Methods (4th ed.), pp. 492ff; and Luchsinger and Arnold, Voice--Speech--Language, pp. 163-164, 309.

A-1. Case History Questionnaire--First Interview (continued)

III. Medical History

Place of Birth:_____

Where have you lived since then?_____

Illnesses: Measles:_____ Mumps:_____ Chicken Pox:_____

Mononucleosis:_____ Scarlet Fever:_____

Pneumonia:_____ Asthma:_____

Other Respiratory Diseases:_____

History of Serious Injury:_____

History of Surgery:_____

Allergies:_____ Continuous or Fluctuating?_____

Hearing:_____ Tonsils:_____ Adenoids:_____

Whooping Cough:_____ Other:_____

Orthodontia:_____

Present Condition: Present State of Health:_____

Height and Weight:_____

Presently on Any Medication?_____

Smoking:_____

IV. Educational Development and Training; Acting Experience and Training

School History:

School	Location	Dates Attended
Elementary:		
Junior High:		
High School:		
College:		
Graduate School:		
Other Schools:		

A-I. Case History Questionnaire--First Interview (continued)

Extra-Curricular Activities:

Vocational Experience:

Hobbies and Interests:

Speech and Voice Training:

Where:_____

Length of Course(s):_____

Description of Course(s): What method of voice was taught? Were you taught a warm-up regimen?

Subjective Evaluation of Course(s):

Vocal Music Training:

Where:_____

Length of Course(s):_____

Description of Course(s): What method was taught? Did your teacher have a preference for open or covered tone? Was your pitch range increased as a result of this training?

Subjective Evaluation of Course(s):

Acting Training:

Where:_____

Length of Course(s):_____

Description of Course(s):

Subjective Evaluation of Course(s):

A-I. Case History Questionnaire--First Interview (continued)

Dance and/or Physical Education Training:

Where:_____

Length of Course(s):_____

Description of Course(s):

Subjective Evaluation of Course(s):

Acting Experience:

Show	Type	Role	Location	Length of Run

Have you ever used specific vocal, physical, or relaxation exercises as a warm-up for rehearsals or performance? If so, please describe your usual regimen.

A-I. Case History Questionnaire--First Interview (continued)

V. History of Vocal Development and Voice Problems:

Have you ever felt as though you were losing your voice?_____
How often?_____
Have you ever lost your voice completely?_____
When?_____ For how long?_____
Describe the circumstances surrounding the loss of voice:

Have you ever consulted a throat specialist?_____ Why?_____
When?_____
Have you ever taken medication for a voice problem?_____
Have you had any surgery on your throat?_____

Does your voice fluctuate
a. By the time of day?_____
b. Certain days of the week?_____
c. Certain times of the year?_____
d. When you are tired?_____
e. When you are nervous?_____
f. When you are ill?_____
g. With amount of normal use?_____

When you wake up in the morning, does it take a while for your throat to clear up?_____ If so, how long must you wait?____
Do you sing?_____ Do you notice more problems after singing than after talking?_____ Do you notice more problems after acting than after talking?_____
Do you clear your throat often?_____ Do you cough often?_____
Does coughing or clearing the throat help to alleviate the symptoms?

Does your throat get dry?_____ When?_____
Does your voice have a tendency to tire easily?_____

VI. Psychological Evaluation

How would you describe your personality?

What problems cause you the most worry or tension (draft, money, grades, social life, etc.)?

Nervous Habits:

Sleeping Habits:
How much sleep do you get per night, on the average?_____
How long does it take you to fall asleep?_____
Any difference during the run of a show?_____

How much and what type of exercise do you normally get?

A-II. Case History Questionnaire--Second Interview

Name:_____
Date of Interview:_____
Time of Interview:_____

Condition of Health Since Last Interview:

Good:_____ Fair:_____ Poor:_____

If poor, specify the difficulty.

Have you seen a doctor since our last interview?_____ If yes,

diagnosis:

Extend of Other Voice-Involved Activities:

Other Productions:

Show and Type	Rehearsal Schedule, Times, and Routine	Performances

Are you taking any classes involving voice this quarter?

Employment:

Present Condition of the Voice:

Subjective Description:

A-II. Case History Questionnaire--Second Interview (continued)

Have you felt lately as though you were losing your voice?_____
Do you now feel that way?_____ How often has this happened?_____
Has it happened on and off, or consistently?_____
In your opinion, is this voice loss related in any way to the demands of the rehearsals for Marat/Sade? _____ Any other contributing factors?

_____

Have you taken any medication or cough drops or throat lozenges because of a throat or voice problem in the last month?

Has your voice been fluctuating with

Time of Day_____
Day of Week_____
Particular Difficulty in Early Morning_____
Particular Difficulty Late at Night_____
Particular Difficulty during or after rehearsals_____
Does the singing you do in this show cause you any more trouble than the speaking?_____

Have you had any trouble keeping the throat clear of phlegm, or due to a tickle in the throat or a cough?_____ If yes, specify.

Has your throat been dry?_____ If so, what makes it get dry?_____
Has your throat been sore?_____ If so, when?_____
Has your throat been tiring easily?

What are your plans once Marat/Sade has closed?

A-III. Case History Questionnaire--Third Interview

Name:_____
Date of Interview:_____
Time of Interview:_____

Condition of Health Since Last Interview:

Good:_____ Fair:_____ Poor:_____
If poor, specify the difficulty.

Have you seen a doctor since our last interview?_____
If yes, diagnosis:

RECORD OF OTHER CURRENT PRODUCTIONS:

Show and Type	Role and Type	Period of Rehearsal	Performances

Subjective description of Use of Voice during the Past Two Weeks:

Subjective Description of Present Condition of the Voice:

A-III. Case History Questionnaire--Third Interview (continued)

Have you had any trouble with your voice in the past two weeks?_____

Have you felt lately as though you were losing your voice?_____
When and how often has this happened?_____

In your opinion, has your voice improved since the close of Marat/Sade?_____
If so, in what way?_____
Has the condition of your throat improved since the close of Marat/Sade?_____
If so, in what way?_____
Have you taken any medication or cough drops or throat lozenges because of a throat or voice problem in the last two weeks?
_____

Has your voice been fluctuating with

Time of Day_____
Day of Week_____
Particular Difficulty in Early Morning_____
Particular Difficulty Late at Night_____

Have you had any colds in the last two weeks?_____
Have you had any allergy problems in the last two weeks?_____
Have you had any trouble keeping the throat clear of phlegm?_____
Have you had a tickle in your throat?_____
Have you been coughing?_____

Has your throat been dry?_____ What makes it get dry?_____
Has your voice been tiring easily?_____

How much sleep have you been averaging per night, in the last two weeks?_____

A-IV. Examiner's Checklist--Breathing Location and Physical Tension*

Name of Subject:_____
Date of Observation:_____

I. Location of Major Breathing Activity:

	Diaphragmatic, or Central	Clavicular, or Shoulder
First Check		
Second Check		
Third Check		

II. Location of Major Breathing Activity During Characterization:

Diaphragmatic, or Central_____ Clavicular, or Shoulder_____

III. General State of Tension or Relaxation:

Direct Observation:

	First Check	Second Check
Very Tense (constant hyperactivity, figiting, stiff posture, dryness, etc.)	_____	_____
Occasionally Tense (intermittent nervous symptoms)	_____	_____
Average	_____	_____
Generally Relaxed (easy posture, absence of tightness or hyperactivity)	_____	_____
Extremely Relaxed (subject appears lethargic or fatigued)	_____	_____

Limp Hand Test:

	Initially	Consciously
Very Tense (hand resists coming up, or stays up when released)	_____	_____
Somewhat Tense (some resistance to manipulation)	_____	_____
Relaxed (passive response to manipulation)	_____	_____
Extremely Relaxed (hand responds like totally dead weight)	_____	_____

*This form was completed by the researcher at each interview.

A-V. Physician's Checklist--Indirect Laryngoscopic Examinations*

Subject's Name:_____ Date of Laryngeal Examination:_____

Examining Physician:_____

Condition of Oral Cavity:

Condition of Naso-Pharynx:

Condition of Pharyngeal Area:

redness:_____ roughness:_____ swelling:_____

post-nasal drip:_____

Condition of Larynx and Vocal Folds:

Was the subject difficult to examine with the laryngeal mirror?_____

Color of Vocal Folds:_____

Position of Vocal Folds:_____

Visible Blood Vessels:_____

Mucous Deposits:_____ Scar Tissue:_____

Swelling:_____

Appearance of Vibrating Edges:

smooth:_____ irregular (please describe):_____

Adduction of Vibrating Edges:_____

Evidence of Pathology:

vocal nodes:_____ contact ulcers:_____ other:_____

Comments, Diagrams, Etc.:

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*This form was completed by the consulting laryngologist at each examination.

A-VI. Procedural Outline--First Interview

EXAMINER CHORES	TAPE	SUBJECT CHORES
-fill out questionnaire -observe location of major breathing activity -prepare equipment for vocal testing	no	1. Case History--oral
-note breathing pauses via slash marks on script	yes	2. Vocal Testing a. Read Grasham and Gooder passage (2x)
-observe general state of tension or relaxation	yes	b. Read same passage while diminishing inflection to a monotone (2x)
-get minimum of two minutes of conversation	yes	c. Discuss your feelings about the play, your own character, or your feelings about the trip to Ypsilanti State Mental Hospital
-recheck state of tension or relaxation	yes	d. Discuss the courses you will be taking this quarter while diminishing vocal inflections to a monotone
-check character breathing efficiency and breathing location	yes	e. Read the following passages in character: Marat: 39-40, 47-49, 109* De Sade: 43-45, 74, 128-129 Roux: 66-67, 100-101, 114 Duperret: 60, 80-81, 123 Inmates: 26-27, 47, 114
-recheck location of major breathing activity	yes	f. Sing up the scale, from the lowest note phonated to the highest note including falsetto (2x)
-check VU meter to keep loudness relatively constant	yes	g. Breathe deeply a few times; then phonate an ah sound at a pitch four tones up from your lowest, holding it for as long as possible
-determine extent of relaxation via the limp hand test	no	h. (Second part) Sit and relax completely
-make appointment (immediately)	no	3. Go for indirect laryngoscopic examination

*All page numbers refer to Peter Weiss, Marat/Sade (New York: Pocket Books, 1966).

A-VII. Procedural Outline--Second Interview

EXAMINER CHORES	TAPE	SUBJECT CHORES
-recorder -observe location of major breathing activity -prepare equipment for vocal testing	no	1. Medical and Subjective Questionnaire--oral
-note breathing pauses via slash marks on script	yes	2. Vocal Testing a. Read Grasham and Gooder passage (2x)
-observe general state of tension or relaxation	yes	b. Read same passage while diminishing inflection to a monotone (2x)
-get minimum of two minutes of conversation	yes	c. Discuss your own feelings about the character as they have evolved, and your techniques of portrayal or your preparation
-recheck state of tension or relaxation	yes	d. Discuss your feelings about the play or this production while diminishing inflection to a monotone
-check character breathing efficiency and breathing location	yes	e. Read the following passages in character (take as much time as you need to prepare): Marat: 39-40, 47-49, 109* de Sade: 43-45, 74, 128-129 Roux: 66-67, 100-101, 114 Duperret: 60, 80-81, 123 Inmates: 26-27, 47, 114
-recheck location of major breathing activity	yes	f. Sing up the scale, from the lowest note phonated to the highest note including falsetto (2x)
-check VU meter to keep loudness relatively constant	yes	g. Breathe deeply a few times; exhale on an ah sound at a pitch four tones up from your lowest, holding it for as long as possible
-determine extent of relaxation via the limp hand test	no	h. (second part) Sit and relax completely
	no	3. Indirect Laryngoscopic Examination

*All page numbers refer to Peter Weiss, Marat/Sade (New York: Pocket Books, 1966).

A-VIII. Procedural Outline--Third Interview

EXAMINER CHORES	TAPE	SUBJECT CHORES
-recorder -observe location of major breathing activity -prepare equipment for vocal testing	no	1. Medical and Subjective Questionnaire--oral
-note breathing pauses via slash marks on script	yes	2. Vocal Testing a. Read Grasham and Gooder passage (2x)
-observe general state of tension or relaxation	yes	b. Read same passage while diminishing inflection to a monotone (2x)
-get minimum of two minutes of conversation	yes	c. Discuss either what you have learned from working on this production, or your appraisal of its critical acceptance
-recheck state of tension or relaxation	yes	d. Discuss any benefits you think you may have obtained from participating in this study, or discuss your plans for this summer while diminishing inflection to a monotone
-recheck location of major breathing activity	yes	e. Sing up the scale, from the lowest note phonated to the highest note including falsetto (2x)
-check VU meter to keep loudness relatively constant	yes	f. Breath deeply a few times; exhale on an ah sound at a pitch four tones up from your lowest, holding it for as long as possible
-determine extent of relaxation via the limp hand test	no	g. (second part) Sit and relax completely
	no	3. Indirect Laryngoscopic Examination

A-IX. Judges' Information and Voice Evaluation Forms

I. Evaluating Judge Information

Name:_____ Date:_____

Educational Record:

Degree	Major	College	Date (or anticipated date) of Completion
1. B.A. or B.S. (circle one)			
2.			
3.			

Experiential Record:

Number of years professional clinical experience:_____
Number of years professional teaching experience:_____
Teaching Certification: Yes_____ No_____
A.S.H.A. Certification: Yes_____ No_____

II. Instructions for Evaluations

For the first set of evaluations, you will be listening to eight male subjects reading a uniform selection. Each subject will read the selection three times in succession. You as evaluator will have two major tasks:

A. Using the forms provided, evaluate each reading in terms of rate, loudness, pitch and quality as soon as you have heard it.
B. After the third reading in each set, please rank them 1 (Best Voice Quality), 2 (Average), 3 (Worst Voice Quality). If you find it impossible to make this judgment, you may rank them accordingly, e.g., 3-2-2 or 1-1-2, etc.

III. Definitions

In order to make the quality evaluations as exact as possible, please make use of the following definitions (adapted from Van Riper and Irwin, Voice and Articulation):

harsh (or strident--tense, strained voice, low in pitch, hard in attack, a bit monotonous in inflection, and characterized by a glottal fry--raspy, rough.

husky (or breathy)--characterized by a great deal of air wastage accompanying phonation; often low in intensity or weak-sounding.

hoarse--combination of husky and harsh (glottal fry, low-pitched, tense and strained, wasting air).

hypernasal--excessively nasal or "whiny" voice characterized by too much nasal resonance.

denasal--"stuffy" voice characterized by little or no nasal resonation.

A-IX. Judges' Information and Voice Evaluation Forms (continued)

RATING FORM NUMBER 1* SPEAKER NUMBER_____

Rating Instructions: On the scales below, 1=Poor, 3=Average, and 5= Excellent. Please circle one numerical evaluation and, if applicable (low), check one explanatory comment.

	FIRST READING	SECOND READING	THIRD READING
RATE	1 2 3 4 5 Too Slow:_____ Too Fast:_____ Monotonous:_____ Too Irregular:_____	1 2 3 4 5 Too Slow:_____ Too Fast:_____ Monotonous:_____ Too Irregular:_____	1 2 3 4 5 Too Slow:_____ Too Fast:_____ Monotonous:_____ Too Irregular:_____
LOUDNESS	1 2 3 4 5 Too Soft:_____ Too Loud:_____ Monotonous:_____ Too Irregular:_____	1 2 3 4 5 Too Soft:_____ Too Loud:_____ Monotonous:_____ Too Irregular:_____	1 2 3 4 5 Too Soft:_____ Too Loud:_____ Monotonous:_____ Too Irregular:_____
PITCH	1 2 3 4 5 Too High:_____ Too Low:_____ Monotonous:_____ Too Irregular:_____	1 2 3 4 5 Too High:_____ Too Low:_____ Monotonous:_____ Too Irregular:_____	1 2 3 4 5 Too High:_____ Too Low:_____ Monotonous:_____ Too Irregular:_____
QUALITY	1 2 3 4 5 Harsh:_____ Husky:_____ Hoarse:_____ Hypernasal:_____ Denasal:_____	1 2 3 4 5 Harsh:_____ Husky:_____ Hoarse:_____ Hypernasal:_____ Denasal:_____	1 2 3 4 5 Harsh:_____ Husky:_____ Hoarse:_____ Hypernasal:_____ Denasal:_____

RANKING THE READINGS:

1=Best Voice Quality
2=Average Voice Quality
3=Worst Voice Quality

First Reading:_____ Second Reading:_____ Third Reading:_____

Additional Comments:

*Adapted from Johnson, Darley, and Spriestersbach, Diagnostic Methods in Speech Pathology, p. 78.

A-IX. Judges' Information and Voice Evaluation Forms (continued)

RATING FORM NUMBER 2 SPEAKER NUMBER_____

Rating Instructions: On the scales below, 1=Poor, 3=Average, and 5=Excellent. Please circle one numerical evaluation and, if applicable (low), check one explanatory comment.

	FIRST DISCUSSION	SECOND DISCUSSION	THIRD DISCUSSION
RATE	1 2 3 4 5 Too Slow:_____ Too Fast:_____ Monotonous:_____ Too Irregular:_____	1 2 3 4 5 Too Slow:_____ Too Fast:_____ Monotonous:_____ Too Irregular:_____	1 2 3 4 5 Too Slow:_____ Too Fast:_____ Monotonous:_____ Too Irregular:_____
LOUDNESS	1 2 3 4 5 Too Soft:_____ Too Loud:_____ Monotonous:_____ Too Irregular:_____	1 2 3 4 5 Too Soft:_____ Too Loud:_____ Monotonous:_____ Too Irregular:_____	1 2 3 4 5 Too Soft:_____ Too Loud:_____ Monotonous:_____ Too Irregular:_____
PITCH	1 2 3 4 5 Too High:_____ Too Low:_____ Monotonous:_____ Too Irregular:_____	1 2 3 4 5 Too High:_____ Too Low:_____ Monotonous:_____ Too Irregular:_____	1 2 3 4 5 Too High:_____ Too Low:_____ Monotonous:_____ Too Irregular:_____
QUALITY	1 2 3 4 5 Harsh:_____ Husky:_____ Hoarse:_____ Hypernasal:_____ Denasal:_____	1 2 3 4 5 Harsh:_____ Husky:_____ Hoarse:_____ Hypernasal:_____ Denasal:_____	1 2 3 4 5 Harsh:_____ Husky:_____ Hoarse:_____ Hypernasal:_____ Denasal:_____

RANKING THE DISCUSSIONS:

1=Best Voice Quality
2=Average Voice Quality
3=Worst Voice Quality

First Sample:_____ Second Sample:_____ Third Sample:_____

Additional Comments:

A-IX. Judges' Information and Voice Evaluation Forms (continued)

RATING FORM NUMBER 3 SPEAKER NUMBER_____

Instructions: In this evaluation, you will hear eight actors read their lines in character from Marat/Sade. For each selection, please describe as accurately as you can, the voice you hear, by checking all labels which apply (at least one in each category), and by adding whatever descriptive comments you wish.

RATE:

Slow:_____
Medium:_____
Fast:_____
Monotonous:_____
Irregular:_____
Other: (Please describe)

LOUDNESS:

Soft:_____
Medium:_____
Loud:_____
Monotonous:_____
Irregular:_____
Other: (Please describe)

PITCH:

Low:_____
Medium:_____
High:_____
Monotonous:_____
Irregular:_____
Other: (Please describe)

QUALITY:

Harsh:_____
Husky:_____
Hoarse:_____
Hypernasal:_____
Nondescript:_____
Rich, Full:_____

ADDITIONAL COMMENTS:

APPENDIX B

MATERIALS RECORDED DURING COLLECTION OF DATA

B-I. Uniform Reading Selection

B-II. Selections from Marat/Sade Read by the Actors

1. Jean-Paul Marat

   --pages 39-40: "Now it's happening . . ."
   --pages 47-49: "They settled down among their treasures . . ."
   --page 109: "Our country is in danger . . ."

2. Marquis de Sade

   --pages 43-45: "Remember how Damiens died . . ."
   --page 74: "In September when I saw . . ."
   --pages 128-129: "Marat, what are all your pamphlets . . ."

3. Jacques Roux

   --pages 66-67: "Pick up your arms . . ."
   --pages 100-101: "Woe to the man who is different . . ."
   --page 114: "Look what's happening . . ."

4. Duperret

   --page 60: "Dearest Charlotte you must return . . ."
   --pages 80-81: "One day it will come . . ."
   --page 123: "Charlotte awaken from your nightmare . . ."

5. Inmates

   --pages 26-27: "We've got rights the right to starve . . ."
   --page 47: "The kings are our dear fathers . . ."
   --page 114: Marat Marat Marat Marat . . ."

B-I. Uniform Reading Selection

George Bernard Shaw's successful play, Pygmalion, has been produced in legitimate theater and motion pictures, and as My Fair Lady in musical comedy. In his preface, Shaw said: "The English have no respect for their language, and will not teach their children to speak it. They spell it so abominably that no man can teach himself what it sounds like. It is impossible for an Englishman to open his mouth without making some other Englishman hate or despise him. German and Spanish are accessible to foreigners: English is not accessible even to Englishmen. The reformer England needs today is an energetic phonetic enthusiast: that is why I have made such a one the hero of a popular play. There have been heroes of that kind crying in the wilderness for many years past. . . . Finally, and for the encouragement of people troubled with accents that cut them off from all high employment, I may add that the change wrought by Professor Higgens in the flower-girl is neither impossible nor uncommon. The modern concierge's daughter who fulfills her ambition by playing the Queen of Spain in Ruy Blas at the Théâtre Français is only one of the many thousands of men and women who have sloughed off their native dialects and acquired a new tongue. But the thing has to be done scientifically, or the last state of the aspirant may be worse than the first. An honest and natural slum dialect is more tolerable than the attempt of a phonetically untaught person to imitate the vulgar dialect of the golf club; and I am sorry to say that in spite of the efforts of our Royal Academy of Dramatic Art, there is still too much sham golfing English on our stage and too little of the noble English of Forbes Robertson."

---

*Grasham and Gooder, Improving Your Speech, pp. 8-9.

B-II. Selections from Marat/Sade Read by the Actors

1. Jean-Paul Marat

--pages 39-40:*

Now it's happening and you can't stop it happening
The people used to suffer everything
now they take their revenge
You are watching that revenge
and you don't remember that you drove the
people to it
Now you protest
but it's too late
to start crying over spilt blood
What is the blood of these aristocrats
compared with the blood the people shed
for you
Many of them had their throats slit by your gangs
Many of them died more slowly in your workshops
So what is this sacrifice
compared with the sacrifices the people made
to keep you fat
What are a few looted mansions
compared with their looted lives
You don't care
if the foreign armies with whom you're making
secret deals
march in and massacre the people
You hope the people will be wiped out so you
can flourish
and when they are wiped out not a muscle
will twitch in your puffy bourgeois faces
which are now all twisted up with anger and
disgust

--pages 47-49:

They settled down among their treasures
and ate and drank with princes
and to the starving they said
Suffer
Suffer as he suffered on the cross
for it is the will of God
And anyone believes what they hear over and
over again
so the poor instead of bread made do with a
picture
of the bleeding scourged and nailed-up Christ
and prayed to that image of their helplessness

*All page numbers refer to Peter Weiss, Marat/Sade (New York: Pocket Books, 1966).

B-II. Selections from Marat/Sade Read by the Actors (continued)

1. Jean-Paul Marat

--pages 47-49 (continued):

And the priests said
Raise your hands to heaven bend your knees
and bear your suffering without complaint
Pray for those who torture you
for prayer and blessing are the only stairways
which you can climb to Paradise
And so they chained down the poor in their
ignorance
so that they wouldn't stand up and fight their
bosses
who ruled in the name of the lie of divine right

--page 109:

Our country is in danger
We talk about France
but who is France for
We talk about freedom
but who's this freedom for
Members of the National Assembly
you will never shake off the past
you'll never understand
the great upheaval in which you find yourselves
Why aren't there thousands of public seats
in this assembly
so anyone who wants
can hear what's being discussed

2. Marquis de Sade

--pages 43-45:

Remember how Damiens died
How gentle the guillotine is
compared with his torture
It lasted four hours while the crowd goggled
and Casanova at an upper window
felt under the skirts of the ladies watching
His chest arms thighs and calves were slit open
Molten lead was poured into each slit
boiling oil they poured over him burning tar
wax sulphur

B-II. Selections from Marat/Sade Read by the Actors (continued)

2. Marquis de Sade

--pages 43-45 (continued):

They burnt off his hands
tied ropes to his arms and legs
harnessed four horses to him and geed them up
They pulled at him for an hour but they'd
never done it before
and he wouldn't come apart
until they sawed through his shoulders and hips
So he lost the first arm then the second
and he watched what they did to him and
then turned to us
and shouted so everyone could understand
And then they tore off the first leg and then
the second leg
he still lived though his voice was getting weak
and at the end he hung there a bloody torso
with a nodding head
just groaning and staring at the crucifix
which the father confessor was holding up to him
That
was a festival with which
today's festivals can't compete
Even our inquisition gives us no pleasure
nowadays
Although we've only just started
there's no passion in our post-revolutionary
murders
Now they are all official
We condemn to death without emotion
and there's no signular personal death to be had
only an anonymous cheapened death
which we could dole out to entire nations
on a mathematical basis
until the time comes
for all life
to be extinguished

--page 74:

In September when I saw
the official sacking of the Carmelite Convent
I had to bend over in the courtyard
and vomit
as I saw my own prophecies coming true
and women running by
holding in their dripping hands
the severed genitals of men

B-II. Selections from Marat/Sade Read by the Actors (continued)

2. Marquis de Sade

--page 74 (continued):

And then in the next few months
as the tumbrels ran regularly to the scaffolds
and the blade dropped and was winched up
and dropped again
all the meaning drained out of this revenge
It had become mechanical
It was inhuman it was dull
and curiously technocratic
And now Marat
now I see where
this Revolution is leading

--pages 128-129:

Marat
what are all your pamphlets and speeches
compared with her
she stands there and will come to you
to kiss you and embrace you
Marat
an untouched virgin stands before you and
offers herself to you
See how she smiles
how her teeth shine
how she shakes her auburn hair aside
Marat
forget the rest
there's nothing else
beyond the body
Look
she stands there
her breast naked under the thin cloth
and perhaps she carries a knife
to intensify the love-play

3. Jacques Roux

--pages 66-67:

Pick up your arms
Fight for your rights
Grab what you need and grab it now
or wait a hundred years
and see what the authorities arrange

B-II. Selections from Marat/Sade Read by the Actors (continued)

3. Jacques Roux

--pages 66-67 (continued)

Up there they despise you
because you never had the cash
to learn to read and write
You're good enough for the dirty work of the
Revolution
but they screw their noses up at you
because your sweat stinks
You have to sit way down there
so they won't have to see you
And down there
in ignorance and stink
you're allowed to do your bit
towards bringing in the golden age
in which you'll all do the same old dirty work
Up there in the sunlight
their poets sing
about the power of life
and the expensive rooms in which they scheme
are hung with exquisite paintings
So stand up
Defend yourselves from their whips
Stand up stand in front of them
and let them see how many of you there are

--pages 100-101:

Woe to the man who is different
who tries to break down all the barriers
Woe to the man
who tries to stretch the imagination of man
He shall be mocked he shall be scourged
by the blinkered guardians of morality
You wanted enlightenment and warmth
and so you studied light and heat
You wondered how forces can be controlled
so you studied electricity
You wanted to know what man is for
so you asked yourself What is this soul
this dump for hollow ideals and mangled morals
You decided that the soul is in the brain
and that it can learn to think
For to you the soul is a practical thing
a tool for ruling and mastering life
And you came one day to the Revolution
because you saw the most important vision
That our circumstances must be changed
fundamentally
and without these changes
everything we try to do must fail

B-II. Selections from Marat/Sade Read by the Actors (continued)

3. Jacques Roux (continued)

--page 114:

Look what's happening
Join together
Cast down your enemies
disarm them
For if they win
they will spare
not one of you
and all that you have won so far
will be lost

4. Duperret

--page 60:

Dearest Charlotte you must return
return to your friends the pious nuns
and live in prayer and contemplation
You cannot fight
the hard-faced enemies surrounding us
You talk about Marat but who's this Marat
A street salesman a funfair barker
a layabout from Corsica sorry I mean Sardinia
Marat the name sounds Jewish to me
perhaps derived from the waters of Marah in the
Bible
But who listens to him
Only the mob down in the streets
Up here Marat can be no danger to us

--pages 80-81

One day it will come
a society which will pool its energy
to defend and protect
each person for the possession of each person
and in which each individual
although united with all the others
only obeys himself
and so stays free
. . . . . .
One day it will come
a constitution in which the natural inequalities
of man
are subject to a higher order
so that all
however varied their physical and mental
powers may be
by agreement legally
get their fair share

B-II. Selections from Marat/Sade Read by the Actors (continued)

4. Duperret (continued)

--page 123:

Charlotte awaken from your nightmare
Wake up Charlotte and look at the trees
look at the rose-colored evening sky
in which your lovely bosom heaves
Forget your worries abandon each care
and breathe in the warmth of the summertime air
What are you hiding
A dagger
throw it away

5. Inmates

--pages 26-27:

We've got rights the right to starve
We've got jobs waiting for work
We're all brothers lousy and dirty
We're all free and equal to die like dogs
And now our lovely new leaders come
and give us banknotes which we're told
are money just as good as gold
but they're only good for wiping your bum

--page 47:

The kings are our dear fathers
under whose care we live in peace
The kings are our dear fathers
under whose care we live in peace
And the children repeated the lesson they believed it
as anyone believes
what they hear over and over again
The kings are our dear fathers
under whose care we live in peace
The kings are our dear fathers
under whose care we live in peace
And over and over again the priests said
Our love embraces all mankind
of every colour race and creed
Our love is international universal
we are all brothers every one

B-II. Selections from Marat/Sade Read by the Actors (continued)

5. Inmates (continued)

--page 114:

Marat Marat Marat Marat
Boo
A laurel wreath for Marat
Down with Marat
A victory parade for Marat
Down with him
Long live the streets
Long live the lamp-posts
Long live the bakers' shops
Long live freedom

APPENDIX C

MATERIALS RELEVANT TO THE MICHIGAN STATE UNIVERSITY PERFORMING ARTS COMPANY PRODUCTION OF MARAT/SADE

C-I. Production Calendar and Schedule of Subject Interviews

C-II. Production Log

C-I. Production Calendar and Schedule of Subject Interviews

WEEK	DATE	TIME	PRODUCTION ACTIVITY	INTERVIEW EXAMINATION
I	3/24/69	7:30-11	Block pages 17-38	
	3/25/69	7:30-11	Block pages 39-71	
	3/26/69	7:30-11	Block pages 71-102	* * * *
	3/27/69	7:30-11	Block second act	* * * *
	3/28/69	7:30-11	Review Blocking	
	3/29/69	all day	Trip to Ypsilanti	
	3/30/69	1-4	Music Rehearsal	
II	3/31/69	7:30-11	Work through I	
	4/1/69	7:30-11	Work through I	
	4/2/69	7:30-11	Work through II	
	4/3/69	7:30-11	Run through I	
	4/4/69	7:30-11	Work through I	
	4/5/69	1-4	Run and Work II	
	4/6/69	1-4	Run through I	
III	4/7/69	7:30-11	Work first half of I	
	4/8/69	7:30-11	Work 2nd half of I	
	4/9/69	7:30-11	Work through II	
	4/10/69	7:30-11	Music Rehearsal	
	4/11/69	7:30-11	Work I with music	
	4/12/69	1-4	Work through I	
	4/13/69	1-4	Work through II	
IV	4/14/69	7:30-11	Run through Show	
	4/15/69	7:30-11	Run through Show	
	4/16/69	7:30-11	Run through onstage	
	4/17/69	7:30-11	Run through onstage	
	4/18/69	7:30-11	First Technical	
	4/19/69	1-5?	First Dress	
	4/20/69	6-10?	Second Dress	
V	4/21/69	6-11	Final Dress	
	4/22/69	Evening	PERFORMANCE	
	4/23/69	Evening	PERFORMANCE	* * * *
	4/24/69	Evening	PERFORMANCE	* * * *
	4/25/69	Evening	PERFORMANCE	
	4/26/69	Evening	PERFORMANCE	
	4/27/69	Evening	PERFORMANCE	
VI	4/28-5/4/69			
VII	5/5-5/11/69			
VIII	5/12/69			* * * *
	5/13/69			* * * *

C-II. Production Log

General Note: Because of the director's particular style of actor coaching (i.e., nose to nose intimate conferences with his actors off in corners), it was somewhat difficult for the investigator to record everything the director told individual actors during the course of the rehearsal period.

3/7 Full Cast Readthrough: no vocal notes.

3/24 First Blocking Rehearsal:

The director discussed the necessity for each inmate-player to experiment, and to evolve one "specific and total behavior" for his particular character, justifiable both in terms of the play and in terms of the psychological problem. In personal conferences with individual actors regarding characterization, he made no direct reference to vocal technique, but used adjectives like "possessed," "sleepy," and "spastic" to describe the qualities he wanted. The inmates as a group were asked for noise or screams or howls or laughs, but only very generally.

3/25 Second Blocking Rehearsal: In blocking the second third of the first act, the director asked cast members for vocal responses by talking of "building the noise to a crescendo," or saying, "Let's have some sound here." He guided the inmates away from an initial, aggressive and loud response to his requests for noise by discussing "reacting not always in terms of violence. Interest, not aggression. Child reactions--not screaming."

3/26 Third Blocking Rehearsal: In blocking the last third of the first act, the director touched incidentally and briefly on types of crowd reactions he desired: "Something more than 'uh, uh, uh,'--see how many sounds you can make . . . murmuring, small noises--aimless . . . add a loud, long sound here . . . sounds of trouble, concern . . . not "oooh' but noises . . . shrill laughter . . . low-pitched laughter . . . low noises."

3/27 Fourth Blocking Rehearsal: In Blocking the second act, general consideration was given to sound. Most comments were of a corrective rather than a directive nature, e.g., "Not all the same sounds, now . . . low enough for Marat to be heard . . . every time you make sounds, don't vomit. . . . Keep the murmur up . . ."

In a personal conference with Marat, the director made specific reference to vocal technique: "I want you to relax a bit--your pitch is too high; use your chest register."

C-II. Production Log (continued)

3/28 Blocking Review and Working through the First Section: References to vocal technique were made incidentally and were often of a corrective nature, e.g., to the inmates, "You can't just go 'uuhhh'--say things. Remember you're not at a political rally (beginning of Act II), you're inmates in an asylum. . . . Take down the cheers and jeers." Regarding the opening of the play, "I don't want a low roar--you're not a subway train, but crazy people--each with your own interest. Individual noises . . . I want the audience to have constantly in mind the possibility that something can happen at any moment--if you yell and shout, nothing can happen."

3/29 Trip for cast to Ypsilanti State Mental Hospital

3/30 Music Rehearsal--musicians and singers only

3/31 Working Rehearsal: This was a very psychologically-oriented rehearsal, due largely to the powerful effect on all of Saturday's trip. When the runthrough began, the director conducted many of the crowd responses almost in the manner of an orchestra leader, basically in terms of volume levels.

Later, he told Marat, "Throw your voice at the sound being made by the inmates, not at Simonne." He also had a number of private talks with various actors during the rehearsal; because of the intimate nature of his actor coaching techniques, they could not be recorded in this log.

4/1 Working Rehearsal: The director continued his practice of conducting speeches non-verbally as the actors read them. He made specific reference to voice when talking to Marat and Simonne; he instructed Marat to strengthen his "stacatto voice quality" and Simonne to work towards a "cooing--long, drawnout sounds in opposition to Marat."

4/2 Working Rehearsal for Act II: The director gave some specific but non-technical vocal coaching to Marat in reference to his speech to the National Assembly. He instructed the actor to take far more time--to build to a peak, break, take a while to compose himself, and begin another build. "Don't yell your way through." He wanted more of a "rhetorical quality." Because of technical problems with the inmates, the sequence had to be run three times. Marat must have been obviously straining vocally, because the director asked, "Do you have enough voice to do it again?"

4/3 Runthrough of Act I: Most of the rehearsal tonight was devoted to a non-stop runthrough of Act I, so there were fewer than the usual number of conferences. A partial workthrough followed, however, and incidental actor-coaching sometimes included vocal skills, e.g., to Marat, "Your first 'Simonne' should be a question--as if you're saying, 'Are you there?' . . . You're building too high on this speech, and then staying on one pitch. Try building, stopping in the middle, and calling for Simonne like a little boy in the dark."

C-II. Production Log (continued)

4/4 Workthrough Second Half of Act I: To Marat ("Now you see it happening. . .), "Don't fight the noise around you; become aware of it, let it annoy and stop you . . . Speak with triumph." To Marat ("Wrong, Sade, wrong . . .) "Catch him vocally--you're not going to get away with that!" Later, the director conducted de Sade's speech--"Build . . . give it to him!"

The director discussed with the inmates the effect he wanted to achieve in Marat's Liturgy ("The kings are our dear fathers . . .") "Say it with halos, absolute reverence, and enunciate! ("Ours is the kingdom of heaven . . .") "Give it a pedantic quality; imitate priests." (Suffer! Suffer as he . . .") "Strong and hard."

4/5 Running and Working through Act II: To Marat, regarding his address of the National Assembly, "Don't fight the noise; enjoy the cheering and then continue your speech . . . Wait for silence and then take it way under." The director also instructed the inmates regarding their responses to Marat's denunciations of Necker, Tallyrand, etc.: "Not yelling and screaming; think of love, sex, pleasure." Regarding the inmates chant to Charlotte Corday ("Corday, Corday, Corday. . ."), "No sound; just whispered."

4/6 Runthrough of Act I: With one minor exception, the director made no comments on vocal technique to the actors today. He did comment to Jacques Roux that he was playing too strongly right now and should seek a "more imploring" quality.

4/7 Working First Half of Act I: To the inmates, regarding the first song, "When you join in, do so as children would, all full, everything you've got." To Roux, regarding his first long (granaries) speech, "Don't yell; whine, complain." To the inmates, regarding "Corday, Corday, Corday . . .," "No sound, unvoiced "Corday.'" To Marat, "The first 'Simonne' should ask, 'Are you there?'" To Marat, regarding the bloodbath speech, "Take far more time internally; use more pure sound before the first 'Simonne!'" To de Sade, "you're getting into a pattern; you're not exploring all the different images." To the inmates regarding Marat's Liturgy, "Your responses must begin as rote recitation and move into hellfire and damnation."

4/8 Workthrough Second Half of the First Act: To Roux, regarding the rabble rousing, "Take more time; not so strong on rabble rousing." Throughout the evening, the director conducted speeches non-verbally for Marat, de Sade, etc. To the inmates, regarding the end of the first act, "No periods at the ends of the lines; someone must pick it up. Give it to him; more accusing." To Roux, regarding his "Woe to the man. . ." speech, "React to what precedes it; take your time."

C-II. Production Log (continued)

4/9 Workthrough of Act II: To Marat, regarding his address to the National Assembly, "Avoid using your top pitch all the time . . . When you speak of Dumouriez, etc., use a more sardonic quality . . . Use the crowd--work on them as a rabble rouser would . . . Enjoy their attention--take lots of time, and make use of the quiet by speaking softly . . . You're on one vocal level; change it. Also, get out of that high pitch." To the inmates, during the address, "Don't build to shouts too fast; use a low, excited murmur . . . Keep the reactions low, not too bit. During the "Marat, Marat, . . .", "Keep it low . . . you've got to grow and build; let the ideas happen! To the inmates, regarding the end of the play, "Keep the noise all the way through; as wild vocally as possible." General note to de Sade, "Reach out vocally."

4/10 Music Rehearsal: work done exclusively on learning melodies, cues and rhythms.

4/11 Workthrough of Act I: Because of difficulties encountered last night, concentration was mainly on music once again; consequently there were no specific vocal coaching notes given.

4/12 Workthrough of Act I: The actor playing de Sade (Subject II) did not attend rehearsal today. A cast member reported to the director that, "He feels o.k., but his voice is gone." The director read his lines in; the rest of the cast worked around him.

Because of room conflicts, the rehearsal was held outside, on the steps of the theatre building. This added a number of interesting dimensions to the rehearsal situation. The inability of the cast members to monitor their own voices due to the absence of familiar acoustical reference points caused people, in the opinion of the researcher, to really push and strain their voices in an attempt to sound to themselves the same as they did when working inside.

To the inmates, regarding responses, "When you have cries, don't cut them off; let them come down . . . keep it going." There was a general orchestration of crowd responses by the director throughout today's rehearsal.

4/13 Workthrough of Act II: Subject II came this morning only to walk through his blocking, as the director read his lines in for him; his voice is still too weak to get through both today's rehearsal and his performance of Staircase tonight.

To Duperret, "Watch your articulation a little." To the inmates, "Noise! C'mon, where's the cheers?" The director orchestrated Corday's speeches manually, and coached the Corday-Duperret scene. "Take your time. . . . Crowd, let's have more reaction on that." The director worked on the individualization of reactions from the inmates in the shower stalls. To Subject V, "Squeal--like you've been caught nude."

C-II. Production Log (continued)

4/14 Runthrough of Entire Show: Although this was a non-stop runthrough, the director was close at hand, coaching the cast through the rough spots, with lots of hand motions (i.e., conducting) and interjections, such as, "C'mon . . . What's wrong? . . . Noise, noise, noise!. . ." After the runthrough, the director sent the inmates home and gave individual notes to the principals, including the following: To Marat, regarding the Citizen Marquis speech, "Catch de Sade vocally! As if you're saying, 'Just a minute!'" To de Sade, regarding the whipping speech, "Don't anticipate vocally, when she is going to whip you . . ." To Marat, regarding the denunciation sequence, "You must build it, so Coulmier must interrupt."

4/15 Runthrough of the Entire Show: Before the runthrough began, the director gave the inmates notes from last night. "Clean up the vocal reactions during the assembly speech . . . Don't cut any vocal reaction; filter it out." During the runthrough, the director orchestrated or coached in placed: "C'mon, no silence . . . c'mon! . . . sshhh . . . noises . . . c'mon." After the runthrough, the director gave specific notes to the principals: To Marat, "You're aspirating a hell of a lot; cut it down--it's distracting." To Marat, regarding the denunciation speech, "Takes too much time; start the build earlier." To Marat, regarding "Beggars, villains, gutter rats. . .", "All these sounds are too elongated; you sound like a hawker." To Roux, "Roux is not a happy man; . . . he needs a quality of tears . . . Moses on the mountain . . . embrace the whole town vocally . . . there is a difference between being loud and being angry."

4/16 First Runthrough Onstage: Before rehearsal, the director gave the inmates their notes: To Subject VI, regarding the "Long Live Napoleon and the nation!" line, "Hit the cue harder and faster; right now it's too slow and light." To all, "Last night the levels were right; this enables Marat to give the Assembly speech far more variety than he has been." To Marat, regarding, "Beggars, villains, gutter rats. . .", "better than last night, but it needs more volume--same for 'I am the Revolution.'" To de Sade, "You're having a problem with your first and second speeches. You need more intensity and a slower rate." (De Sade countered one critical note with the comment: "That's where I got my throat stuck.") To de Sade, "You tend to come in on a fairly low level of intensity and then work your way up. You must start stronger." To Marat, "You tend to take a beat before responding to Simonne and Sade verbally--it's not immediate enough."

4/17 The director gave the cast general notes on last night's runthrough. "The noises were never there! The vocal balance of the whole thing was way off."

During tonight's partial workthrough, the director conducted and coached many of the speeches from the first row of the house while they were being delivered. Occasionally, he would interrupt with specific comments: "Everytime you have a reaction like a yell, don't

C-II. Production Log (continued)

4/17 continued

cut it, fade it out . . . C'mon; where are you? . . . Noise! . . . Sound! . . . There's a nice big crowd reaction at the end of this--remember? Whenever there's a pause, I want sound . . . C'mon, C'mon! . . . If you don't make noise, this play will never work! . . . Ssshhh! . . ." During the runthrough portion, he conducted crowd laughter and other crowd reactions.

The runthrough didn't end until 11:20 P.M., and the director sent the cast home without notes.

4/18 First Technical Runthrough: Before beginning the runthrough, the director gave the cast two general notes: "I can't conduct you during performance; it's got to be alive. . . . Don't mimic people who are speaking onstage." During the runthrough, he remained pretty much audience, but once in a while, he called, "Noise! . . . Reaction! . . . C'mon . . . Sshh!" There were no notes given after rehearsal.

4/19 First Dress Rehearsal: Before the rehearsal began, the director gave notes stemming from yesterday's rehearsal to the inmates: "A number of reactions are good now, but a number of them are gone again. . . . Remember all the sounds on Corday's arrival in Paris. Let's have a real strong reaction after the tumbrel song. . . . By the way, the monster is much too loud much too soon. . . . Let's have a nice crowd reaction on 'God, like man, moves in mysterious ways!" To Duperret, "You need much better articulation. . . ." To all, "Under Roux's 'Pick up your arms . . .' speech, there must be a great undercurrent of sound--create a real potential for danger. . . . The sound under the duckboards must be more controlled--whispers under Marat; laughing under Simonne; light snickery laughter under Duperret's song. . . . To Subject V, "Much stronger reactions behind the curtains." To all, "There should be a crowd reaction to Corday's listing of the names . . . a murmur of anticipation, for the guillotining of all these men. . . . The reaction during the black cloth thing is much too loud; it upsets the vocal balance. Don't take the noise up until after Marat's lines. The director did not interrupt at all during the runthrough itself, nor did he give any notes afterwards.

4/20 Second Dress Rehearsal: The director circulated among the actors as they put on their make-up before rehearsal to give notes from last night. The investigator was unable to listen in on them all, but did record the following: To Marat, "Beggars, villains, gutter rats is still too low in volume--take it out to the house, not to the side." Before beginning the runthrough, he gave the inmates their general notes: "On 'Who controls the market . . .' let's have varied reactions; right now you sound like a bunch of owls--who, who, who. . . . During the circles, we must have inmate reactions . . .

C-II. Production Log (continued)

4/20 continued

fill those musical interludes! . . . Watch the specific ad libs; keep them general." To Subject V, "When Corday opens your booth, yell out, 'Leave me alone!'" To all, "At the end, simmer down the riot noise until it becomes silent."

After the runthrough, the director kept the principals for notes: To Marat, "Reach out vocally for de Sade on the compassion dialogue; pick up each other's cues faster." To Marat again, "On the divine right speech, the sound is wrong; don't draw it out." To Roux, "You were using an awful lot of falsetto tonight; cut it out! Get back into that nice guttural quality." To Marat, "You went into a falsetto after the whipping scene--no good. Pick up de Sade's level--you're too far under. (Marat replied, "Yeah, I know, but I'm so tired by then!")

4/21 Final Dress Rehearsal:

NOTE: During the afternoon, Subject II came to report to me that he had been screaming during an improvisation in acting practicum, and that his "whole voice went."

Subject VII was absent from the final dress rehearsal due to what was described as strep throat.

Before the final runthrough began, the director gave the inmates general notes stemming from last night's rehearsal: "Let's have a reaction from the inmates on 'take out the still-beating heart and swallow it' and on 'anarchy and confusion.'" To all, "React to Roux on 'Pick up your arms' . . . React on 'Monsieur de Sade is whipped.' Also react to the whipping itself . . . I need a reaction to, "I am the Revolution,' and to 'I will find out what he has got to say to me.' Also, what happened at the end of the tumbrel driver's song? Oh yes, and let's have some reaction to 'Beggars! Villains! Gutter rats!', . . 'Marat, we're poor . . .' must have a nice hushed quality--lots of air escaping." To Subject V, The 'Leave me alone' must be much louder. Give it a nice, long yell!"

After the rehearsal, the director kept the principals back for their notes: To de Sade, regarding "Your feelings were never petty . . . ," "Much too falsetto!" (De Sade answered, "I know; my voice is creaking.") To Marat, "On your 'manipulate' speech, improve the articulation." To Roux, "Your last speech of Act I was off tonight; it must have more carrying power."

4/22 Opening Night Performance: Before curtain, the director assembled the cast for a few notes: "Now remember--I want sound at the beginning, during your warm-up. . . . Give the 'freedoms' under Marat's speech a yearning quality; they're too dead right now. . . . Build the laugh under Duperret's song. . . . For the final curtain, small sounds, light laughter."

4/23 NOTE: Subject VII reported for make-up on time tonight, took sick, and virtually passed out. He was rushed to the health service, where he was admitted immediately, the tentative diagnosis being emphysema resulting as a complication of strep throat.

Subject II has been having a great deal of trouble with his throat. He reported that he "gagged for about an hour before coming to the theatre" and had a rather lengthy coughing bout onstage tonight during the whipping sequence.

The director was out of town tonight, but left notes from last night's performance with the assistant director, who gave them to the cast before curtain. To all, "The noise levels under almost every speech was too loud."

4/24 The director did not attend last night's performance; his assistant director took notes for him and gave them to the cast members, but there were no vocal references included.

4/25 Tonight, before performance, the director assembled the cast for notes on last night's show, which he felt was tight but too slick and too relaxed to him. To Marat, "You swallowed the line, '. . . pretext of giving them freedom' . . . The monster speech must reach a climax by the end; it was weak last night." To Roux, "Last night, you were losing the tearful quality we talked about before." To all, "The reactions of the crowd were way down and out . . . Fire out your lines, 'We've got jobs,' etc. React to "Beggars, villains, gutter rats!'" To de Sade, "Your 'hook and twine' line was too fast. . . . Your 'Of course!' was a bit weak last night."

4/26 The director gave personal notes to individual principals tonight during make-up. He was pleased with last night's performance, and all of the notes were of the "Make it just as good as it was last night" variety.

4/27 Before curtain tonight, the cast was assembled for final notes: To Marat, regarding the '. . . rioting mob inside me' speech, "Don't make it exhausted but pain-filled. Don't swallow '. . . but we don't know how to run it." To the inmates, "Your reactions were too even during the first part of the first act."

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