

---

# Personality Traits and Psychological Factors in Voice Pathology: A Foundation for Future Research

---

## Nelson Roy

Department of Communication Disorders and Division of Otolaryngology-Head & Neck Surgery  
The University of Utah  
Salt Lake City

## Diane M. Bless

Department of Communicative Disorders and Division of Otolaryngology-Head & Neck Surgery  
University of Wisconsin-Madison

It has been argued that personality, emotions, and psychological problems contribute to or are primary causes of voice disorders and that voice disorders in turn create psychological problems and personality effects. This article (a) briefly reviews the literature surrounding the role of psychological and personality processes in individuals with functional dysphonia (FD), vocal nodules (VN), and spasmodic dysphonia (SD); (b) provides an overview of recent concepts in personality and trait structure; and (c) summarizes the fundamental tenets of a theoretical synthesis proposed by Roy and Bless (2000) to explain the dispositional bases of FD and VN. This theory links FD and VN to the signal sensitivities and behavioral response biases of neurotic introverts and neurotic extraverts, respectively. In a companion article, the merits of the Roy and Bless theory are evaluated.

**KEY WORDS:** voice disorders, personality traits, functional dysphonia, vocal nodules

---

The human voice has long been regarded as a "barometer of emotion" and a "mirror of personality," implying that the voice reflects individual differences in emotional state and personality disposition (Aronson, 1990; Diehl, 1960). The early association between voice and personality is revealed in the derivation of the word *personality*. Moses (1954) explained that the term first originated from the Latin *persona*, which meant the mouthpiece of a mask worn by actors (*persona*: the sound of the voice passes through). The term's meaning changed from the mask to the actor, the "person" in a theatrical production. The word eventually evolved to represent any person and ultimately "personality," but over the years the symbolic connection with the voice was lost. Almost 50 years have passed since Moses published his classic text describing the complex interplay of emotional dynamics, personality, and voice production; however, little progress has been made in our understanding of the relation between personality, voice, and voice disorders.

Despite few advances, voice clinicians continue to endorse the voice-psychology association by offering emotional or personality factors as possible causal explanations when the voice becomes disordered (Aronson, 1990; Colton & Casper, 1996; Stemple, 1993). The debate over the role of personality or psychological processes is most controversial in the case of such disorders as functional dysphonia (FD), vocal nodules

(VN), and spasmodic dysphonia (SD). It is unclear whether personality and emotional maladjustment contribute to or are primary causes of these voice disorders or, alternatively, whether these voice disorders create psychological problems or personality effects (Cooper, 1973). Today many of the same questions that existed in Moses' time remain unanswered: Do personality or psychological differences exist among voice-disordered groups? If so, which personality factors might be causally significant?

This article briefly reviews the literature surrounding the role of psychological and personality processes in individuals with these voice disorders and summarizes a theory that identifies personality as a contributing factor in the development of FD and VN. Finally, in a companion article (Roy, Bless, & Heisey, 2000), data are provided that evaluate the predictions and fundamental tenets of the theory at a superfactor trait level of personality description.

### **Personality and Vulnerability to Voice Disorders and Illness**

The notion that personality characteristics might influence vulnerability to illness and illness progression has already received much attention in the health psychology literature (Akistal, Hirshfeld, & Yerevanian, 1983; Smith & Williams, 1992; Stone & Costa, 1990; Suls & Rittenhouse, 1990). It has been argued that different personality traits might predispose one to certain diseases/disorders, influence symptomatology and course, and in turn be affected by the experience of illness (Contrada, Leventhal, O'Leary, 1990; Holroyd & Coyne, 1987). These models fall into two general categories. The first category includes a range of predisposition or vulnerability models, in which personality characteristics are proposed either to directly cause the development of the disorder or to indirectly modify the course or expression of the disorder. The second category, referred to as disability (scar) hypothesis models, asserts that certain disorders affect personality; that is, the experience of the disorder/illness causes personality changes. These changes may represent either unresolved residual symptoms of the disorder or relatively stable post-episode character adaptations (Akistal et al., 1983). The models, which relate personality and illness, provide a useful context for the companion investigation, which aims to explore the role of personality and psychological processes in select voice pathologies.

### **Limitations of Existing Research**

The voice literature is replete with speculations linking FD, VN, and SD to psychological precursors and personality variables. However, objective research is

scarce, and the majority of writings on this topic are based primarily on anecdote and clinical impressions.

The existing research is generally disappointing for a variety of reasons and has been critiqued previously in reviews by Roy and Bless (2000) and Green (1988). In short, most studies mix voice disorder types and sexes into a single group, rendering interpretation of the results difficult, if not impossible. Furthermore, investigators often fail to compare their findings with those for other voice-disorder groups. This hinders interpretations of commonality versus specificity (Deary et al., 1997). Thus, it is unknown whether the results are unique to the subgroup of patients studied or applicable to voice-disordered patients in general. Finally, information is not provided regarding the severity of vocal handicap or duration of the vocal symptoms. Therefore it cannot be ascertained whether psychological or personality differences merely represent the outcome of the vocal disability.

These methodological inadequacies make it very difficult to generalize the results and to evaluate the specific nature of the voice disorder–personality relationship. There is currently no clear evidence of whether personality or psychological processes should be considered causal, correlational, or consequential. With these caveats in mind, the following sections will summarize empirical research findings as they relate to FD, VN, and SD. Despite methodological differences and shortcomings, some interesting trends do surface.

### **Functional Dysphonia**

Functional dysphonia refers to a voice disorder in the absence of identifiable neurological or structural pathology (Koufman & Blalock, 1982; Morrison, Nichol, & Rammage, 1986). Some controversy surrounds the term *functional dysphonia*, and confusion exists because FD is often used as the general descriptive term for a host of medically unexplained voice disorders. Functional dysphonia is sometimes broadly synonymous with hysterical, psychogenic, conversion, psychosomatic, hyperkinetic, hyperfunctional, muscle misuse, or muscle tension dysphonia. As is obvious by the range and variety of labels, theorists' opinions differ concerning the relative contribution of psychological factors to the formation of functional voice disorders (Cooper, 1973).

Functional dysphonia, which may account for more than 10% of cases referred to multidisciplinary voice clinics (Schalen & Andersson, 1992), occurs predominantly in women and, like many other voice disorders, commonly follows upper respiratory infection symptoms (Aronson, Peterson, & Litin, 1966; Friedl, Friedrich, & Egger, 1990; Gerritsma, 1991; Kinzl, Biebl, & Rauegger, 1988; Milutinovic, 1991). The disorder is frequently transient

and varies in its response to treatment (Bridger & Epstein, 1983; Fex, Fex, Shiromoto, & Hirano, 1994; Koufman & Blalock, 1982; Roy & Leeper, 1993). Functional *dysphonia* and *aphonia* are sometimes regarded as disorders represented on a continuum of severity and in some cases are believed to share a common etiology (Aronson, 1990; Aronson et al., 1966). In *aphonia*, patients lose their voice completely and articulate in a whisper, whereas *dysphonia* suggests phonation is preserved but disturbed in quality, pitch, and/or loudness (Boone & McFarlane, 1988). Most studies investigating personality and/or psychological processes group both disorders under the designation "psychogenic voice disorder," reflecting the etiological supposition. Some authors caution that distinctions must be made between *aphonia* and *dysphonia* to prevent overestimation of the role of psychological factors in *dysphonia* (Friedl, Friedrich, Egger, & Fitzek, 1993).

### Psychological Mechanisms in FD

Diverse psychopathological processes contributing to voice symptom formation in FD have been proposed. An extensive review of all possible mechanisms is beyond the scope of this article; thus, only a brief overview is provided. The interested reader is referred to Roy and Bless (2000) for a more complete exploration of the putative psychological and personality processes involved in FD.

The dominant psychological explanation for medically unexplained voice loss is the concept of conversion disorder introduced by Freud (Aronson, 1990; Butcher, 1995; Greene & Mathieson, 1989; Stemple, 1984, 1993). Conversion disorder involves unexplained symptoms or deficits affecting voluntary motor or sensory function that suggest a neurological or other general medical condition (American Psychiatric Association, 1994). The conversion symptom represents an unconscious simulation of illness that apparently prevents conscious awareness of emotional conflict or stress, thereby displacing the mental conflict and reducing anxiety. When the laryngeal system is involved, it is referred to as conversion *dysphonia* or *aphonia*.

Butcher and colleagues (Butcher, 1995; Butcher, Elias, Raven, 1993; Butcher, Elias, Raven, Yeatman, & Littlejohns, 1987) argue against conversion disorder as the most common cause of *dysphonia* unaccounted for by pathological findings. In the place of conversion, Butcher (1995) offers two alternative psychological models to account for partial or complete functional voice loss. The first model is a slightly reformulated psychoanalytic explanation, whereas the second is based on cognitive-behavioral principles. Despite somewhat different causal pathways, both models clearly emphasize the inhibitory effects of excess laryngeal musculoskeletal tension on voice production.

The subject of poorly regulated laryngeal muscle tension is also a theme in the writings of Morrison and colleagues (Morrison & Rammage, 1993; Rammage, Nichol, & Morrison, 1987) and Aronson (1990), among others (Colton & Casper, 1996; Greene & Mathieson, 1989). Nichol, Morrison, and Rammage (1993) proposed that "tensional symptoms arise from the overactivity of autonomic and voluntary nervous systems in individuals who are unduly aroused and anxious" (p. 644). They added that such overactivity leads to hypertonicity of the intrinsic and extrinsic laryngeal muscles, resulting in muscle tension *dysphonias* sometimes associated with adjustment or anxiety disorders or with certain personality trait disturbances. Rammage et al. (1987) also proposed that a relatively minor organic change, such as edema, infection, or reflux laryngitis, might trigger functional misuse, particularly if the individual is exceedingly anxious regarding his or her voice or health. The same authors speculated that anticipation of poor voice production in hypochondriacal, dependent, or obsessive-compulsive individuals leads to excessive vigilance over sensations arising from the throat (larynx) and respiratory system that may lead to altered voice production.

Finally, although most authors have viewed personality and psychological factors as strongly influential in the development of FD, they have virtually ignored the possibility that such processes could be the negative consequence of coping with an incapacitating voice disorder (i.e., the disability hypothesis). Because voice problems can be associated with a number of adverse consequences, including laryngeal discomfort, fatigue, and impairment of social and/or occupational functioning (with a concomitant loss of self-esteem and social support), it is not unreasonable to postulate that chronic voice problems might lead to general personality changes, such as the development of heightened feelings of distress and dissatisfaction and social withdrawal. Depression, anxiety, and tension are frequent psychological concomitants of chronic illness (Dubovsky & Weissberg, 1982; Nemiah, 1961; Reiser, 1980). The notion that such sequelae could be considered outcomes of a severe voice disturbance, rather than causal agents, has received little research attention.

### Assessment of Psychological Processes in FD

Empirical evidence to support the various psychological mechanisms offered to explain FD has seldom been provided. It should be recognized that many of these theories are untestable from a scientific perspective. Only a few studies exist that have used standardized instruments to assess the personality or psychological characteristics of patients with FD. A complete review of the relevant findings and interpretations is provided

in Roy et al. (1997). As Roy and colleagues indicate, direct comparison of the observations is restricted because of significant methodological differences. Such differences might account for the disparate results regarding the frequency and degree of hysterical personality traits (Aronson et al., 1966; Gerritsma, 1991; Kinzl et al., 1988), conversion reaction (House & Andrews, 1987; Pfau, 1975), and psychopathological symptoms (Aronson et al., 1966; Gerritsma, 1991; House & Andrews, 1987; Kinzl et al., 1988; Pfau, 1975). Despite their methodological differences/inadequacies, these studies have identified a trend toward elevated levels of (a) anxiety, (b) somatic complaints, and (c) introversion in the FD population. Patients have been described as socially anxious, nonassertive, and with a tendency toward restraint (Friedl et al., 1990; Gerritsma, 1991). These researchers have not attempted to explicitly integrate their findings into a coherent theory of personality as a contributing factor for FD.

In a recent study, Roy et al. (1997) described the personality/psychological characteristics of female subjects with the diagnosis of FD. All subjects experienced symptom resolution following voice treatment. While vocally asymptomatic, these remitted FD subjects completed the Minnesota Multiphasic Personality Inventory (MMPI), an objective personality questionnaire (Hathaway & McKinley, 1972). When compared to a general medical outpatient control group, the FD subjects scored significantly higher on 7 of 10 clinical scales, suggesting an elevated degree of emotional maladjustment. The FD subjects were described as depressed, anxious, somatically preoccupied, and introverted. The results suggested that in spite of symptom improvement after voice treatment, these subjects continued to exhibit poor levels of adaptive functioning. With the exception of the Depression scale, all clinical scales were viewed as assessments of character, not mood (Butcher, Dahlstrom, Graham, Tellegen & Kaemmer, 1989; Duckworth & Anderson, 1995; Graham, 1987, 1990; Marks, Seeman, & Haller, 1974; Newmark, 1979). Therefore, the authors interpreted the data to support a dispositional (trait-like) vulnerability for the development of functional symptoms, including laryngeal problems.

## Vocal Nodules

Vocal nodules are benign callous-like lesions of the vocal folds often attributed to chronic, repetitive phonotrauma producing biomechanical tissue stresses and reactive histological changes. Vocal nodules are considered a common manifestation of vocal hyperfunction—that is, abuse and/or misuse of the vocal mechanism due to excessive and/or “imbalanced” muscular forces (Hillman, Holmberg, Perkell, Walsh, & Vaughan, 1989, 1990)—and may account for almost 4% of an otolaryngology caseload (Nagata et al., 1983). In adults, at least

two thirds of patients with VN are female (Herrington-Hall, Lee, Stemple, Niemi, & McHone, 1988; Nagata et al., 1983). Surgical removal is one method of treatment; however, a more conservative approach is behavioral voice treatment that attempts to eliminate the supposed cause(s) of the vocal nodule rather than the nodule itself. The short-term results of behavioral treatment programs or surgical excision are generally favorable (Bouchayer & Cornut, 1988; Lancer, Syder, Jones, & Le Boutillier, 1988; Murry & Woodson, 1992), but few studies have objectively evaluated long-term clinical outcomes. At least anecdotally, it appears that despite the efforts of surgeons and voice therapists, the lesions in some adults are resistant to treatment and/or tend to recur (Bridger & Epstein, 1983). One factor that may interfere with successful treatment is poor extraclinical compliance with treatment recommendations (Verdolini-Marston, Burke, Lessac, Glaze, & Caldwell, 1995).

For the most part, authors have attempted to distinguish VN from other mass lesions and other voice disorders, such as FD. However, some clinicians have classified VN as a functional disorder and have emphasized the role of psychological precursors and predisposing personality factors (Arnold, 1962; Aronson, 1990; Wilson, 1987). One common view is that people with vocal nodules are talkative and have aggressive tendencies (Arnold, 1962; Aronson, 1990; Green, 1989; Mosby, 1970; Nemeč, 1961; Toohill, 1975; Wilson, 1971; Wilson & Lamb, 1974; Withers & Dawson, 1960). Elevated levels of anxiety, emotional reactivity, and maladjustment, as well as high levels of extraversion, have been found among patients with VN (Mosby, 1970; Peter & Brandell, 1980; Toohill, 1975; Yano, Ichimura, Hoshino, & Nozue, 1982).

In a recent study using the MMPI, Roy, McGrory, and Bless (1995) identified elevated levels of psychological distress and somatic complaints in a group of adult female VN patients when compared to a medical outpatient control group. Goldman, Hargrave, Hillman, Holmberg, and Gress (1996) confirmed these findings when they identified elevated levels of anxiety, somatic complaints, and voice use among VN patients as compared to non-voice-disordered controls. No differences, however, were identified between the VN subjects and a voice-disordered control group—who were free of mucosal disease.

Recently, White, Deary, and Wilson (1997), using the General Health Questionnaire (GHQ) and Eysenck Personality Questionnaire (EPQ), found no significant differences in personality traits when comparing dysphonic patients (both functional and organic) with outpatient otolaryngology controls. They did, however, identify elevated levels of psychological distress in both voice-disordered groups and concluded that it was impossible to identify those dysphonia patients with a major underlying psychological upset solely on the basis of laryngeal

appearance and phonatory characteristics. Thus the pattern of results, although by no means definitive, suggests a trend toward elevated levels of extraversion and anxiety among subjects with VN. Further research is necessary to better appreciate the relationship between personality and VN development and maintenance.

## **Spasmodic Dysphonia**

Spasmodic dysphonia is a poorly understood voice disorder characterized by intermittent voice arrests and strained-strangled voice quality (Cannito, 1991). The effortful voice spasms fluctuate in severity and may remit for hours or even days at a time. The male-to-female ratio ranges from 1:1 to 1:4. The intermittency and laryngeal specificity of symptoms have historically led many to invoke a psychological explanation for this enigmatic disorder (Bloch, 1965; Brodnitz, 1962; Heaver, 1960). As reported in Cannito (1991), so universal was this opinion that in his review of the literature, Arnold (1959) wrote that since its original description, "all authors agreed that spastic dysphonia represented a psychoneurotic disorder of pneumophonic co-ordination" (p. 4). In the psychoanalytic tradition, many clinicians viewed SD symptoms as a hysterical conversion reaction whereby intrapsychic conflict was unconsciously converted into a voice disturbance (Brodnitz, 1962; Heaver, 1960). In a retrospective review of 130 cases of SD seen during his career, Brodnitz (1976) reported that 41% of patients could identify severe emotional trauma preceding the onset of SD, and a further 22% exhibited symptoms consistent with severe neuroses. Descriptions of this sort typically included symptoms of anxiety, depression, and somatic preoccupation.

Despite some controversy (Cooper, 1980), there is near consensus that SD is an action-induced focal laryngeal dystonia, whose onset of symptoms is often related to emotional upset or environmental stresses (Blitzer, Lovelace, Brin, Fahn, & Fink, 1985; Finitzo & Freeman, 1989; Ludlow, Hallett, Sedory, Fujita, Naughton, 1990). The psychiatric literature on SD remains sparse, and in only six studies has an attempt been made to assess psychological factors in SD.

Aronson, Brown, Litin, and Pearson (1968) administered the MMPI and used psychiatric interviews. Traits most frequently observed in the so-called emotionally involved patients included, but were not limited to, suppressed anger, compulsiveness, and verbal repression. Elevations on scales of depression and social introversion were noted; however, the MMPI results failed to distinguish the subjects with SD from a general medical outpatient population.

Izdebski, Dedo, and Boles (1984) evaluated the case histories of 200 SD patients who were subsequently

submitted to recurrent laryngeal nerve sectioning. Despite identifying a higher incidence of somatic complaints/illnesses among the SD group when compared with normal controls, the authors inferred from the case histories that there was "no specific clustering of factors or patterning of events that could be regarded as contributing to the causation of SD" (p. 10). These authors concluded that their findings unequivocally failed to support a psychological basis for SD.

Cannito (1991) examined the emotional characteristics of 18 SD patients as compared with normal controls matched for age and sex. Statistically significant elevations were noted in the group with SD on psychometric measures of depression, anxiety, and somatic complaints. Cannito suggested that emotional/psychological factors associated with SD may affect contemporary research, and an improved understanding of the disorder should include knowledge pertaining to the contribution of emotional factors.

Recently, Kiese-Himmel and Zwirner (1996) administered standardized psychometric tests to 18 subjects with adductor SD and did not identify any significant differences in emotional instability, hypochondriasis, somatization, or depression when compared to published test norms. However, the authors suggested that the personality structure of nearly half of the patients showed a tendency toward increased achievement orientation and trait anxiety. Many patients had experienced mild-to-moderate psychosocial stress within the 2-year period preceding the onset of symptoms. These investigators concluded that SD is probably the result of a combination of unknown neurological and psychosocial factors.

Other investigators have explored changes in measures of depression and anxiety following treatment for SD with botulinum toxin injections. Murry, Cannito, and Woodson (1994) reported reduced levels of depression and anxiety one week after injection and maintenance of these improvements during the ensuing 2-month postinjection period. Liu et al. (1998) confirmed elevations on scales of anxiety, depression, and somatization symptoms in a group of patients with SD when compared to a matched healthy control group. One month following botulinum toxin injection, however, significant improvements in affective adjustment and quality of life were observed. Collectively, these researchers concluded that elevated depression and anxiety might best be regarded as state-dependent characteristics, most suitably viewed as concomitant rather than causal.

It is apparent from the preceding discussion that the presence and character of psychological processes and personality factors in SD is unclear. Experimental verification is needed to elucidate the relationship between psychological sequelae and SD.

# A Theory of the Dispositional Bases of Functional Dysphonia and Vocal Nodules

It is evident that the cause of common voice problems such as FD, VN, and SD is poorly understood and may involve the convergence of multiple factors, including organic, psychological, and social features. One obstacle limiting progress in the field of voice pathology is the difficulty in conceptualizing personality-psychological processes that might contribute to the development and maintenance of particular voice disorders.

Roy and Bless (2000) proposed a theory that identified personality traits as important factors in the development and maintenance of FD and VN. The theory is based on Newman and colleagues' (Newman & Wallace, 1993a, 1993b; Patterson & Newman, 1993; Wallace & Newman, 1991) coupling of a biological theory of personality (Eysenck, 1967; Eysenck & Eysenck, 1985) with a neuropsychological model of the conceptual nervous system (Gray, 1975). Based on differences in personality, the theory predicts "unique" and "contrasting" signal sensitivities and behavioral response biases for individuals with FD and VN. Roy and Bless proposed that specific personality traits predispose one to develop these disorders and to moderate the symptomatology and course of the voice pathology. Moreover, by virtue of its enduring nature, personality is postulated to serve as a persistent diathesis, rendering an individual vulnerable for recurrence of symptoms. Given the presumed neuropathological origins of SD, personality was not proposed to play a causal role. The following sections briefly outline the theory's foundations and its predictions.

## Personality and Its Hierarchical Structure

Most definitions of personality indicate that it is internal, organized, enduring—characteristic of an individual over time and situations—and related to how an individual functions in the world. The term *personality* implies a complex organization of systematically interrelated trait dispositions (Watson, Clark, & Harkness, 1994). Traits are typically defined as durable dispositions (response tendencies) that reflect individual differences (Tellegen, 1985). Genetic and environmental factors have been implicated in trait formation (Plomin, Loehlin, & Defries, 1985), and certain personality traits vary with age and sex (Eysenck & Eysenck, 1975).

It is widely acknowledged that personality traits are hierarchically arranged, with specific but narrow traits at lower levels in the hierarchy and global but broad traits at the top (Goldberg, 1993; John, 1990); see Figure 1. At

the highest level of the trait hierarchy exist three stable, heritable, general personality dimensions or "superfactors." These relatively orthogonal superfactors provide the global classification of personality traits (Digman & Takemoto-Chock, 1981; John, 1990). The so-called "Big Three" dimensions are commonly referred to as (1) Extraversion versus Introversion (E), (2) Neuroticism versus Stability (N), and (3) Constraint versus Disinhibition (CON).<sup>1</sup>

The "Big Three" personality dimensions are typically derived using factor analytic techniques and thus are not necessarily tied to actual psychobiological processes. Although many personality theories exist (see Peterson, 1988 for a review), some investigators such as Hans Eysenck (Eysenck, 1967; Eysenck & Eysenck, 1985) and Jeffrey Gray (1982, 1987) have linked the superfactors to specific psychophysiological processes and neurobiological substrates. Extraversion (E) and Neuroticism (N) play a vital role in the Roy and Bless theory, which borrows from a synthesis of Eysenck's and Gray's biological theories of personality to account for the development of FD and VN (Newman & Wallace, 1993a, 1993b; Patterson & Newman, 1993; Wallace & Newman, 1991). The reader is referred to Roy and Bless (2000) for a complete explication of the theory and its assertions.

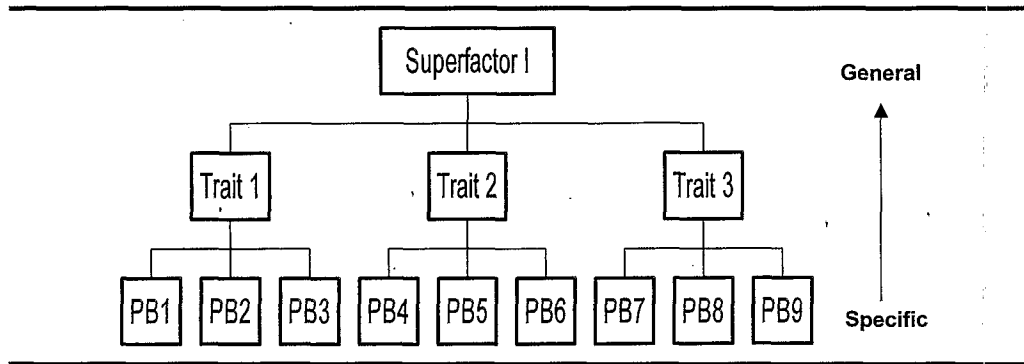
## Eysenck's Personality System

H. J. Eysenck (1967) developed an integrated biopsychosocial theory of personality that is based primarily on two of the superfactor dimensions of personality: Extraversion (E) and Neuroticism (N). Extraversion involves the willingness to engage and confront the environment, including the social environment. Extraverts (high E) tend to be dominant, sociable, and active, whereas introverts (low E) tend to be quiet, unsociable, passive, and careful. Eysenck views E as reflecting stable differences in the activity level of the ascending reticular activating system, and thus cortical arousal.

Neuroticism, the second personality dimension, can be likened to emotionality and is related to anxious, depressed, tense, and emotional characteristics. High-N individuals tend to be emotionally unstable, worried, or highly reactive to environmental stimuli. Eysenck (1967) identified the visceral brain as the neural substrate of N. This included the septum, hippocampus, cingulum, amygdala, and hypothalamus. Neuroticism magnifies

<sup>1</sup>Constraint versus disinhibition (CON) is centered on the basic issue of impulse control. High constraint individuals are cautious, restrained, refrain from risky adventures, and accept the conventions of society. These individuals plan carefully before acting and avoid situations involving risk or danger. Low-constraint persons are relatively impulsive, adventurous, and inclined to reject conventional restrictions (Clark, Watson, & Mineka, 1994).

**Figure 1.** The hierarchical organization of personality. Different levels in the trait hierarchy represent different levels of breadth or abstraction in personality description. Several narrow, specific traits cluster to define a single broad dimension or superfactor. These lower-level constituent traits are linked to many interrelated "psychological behaviors (PB)," including actions, thoughts, and feelings.



response tendencies derived from E (Eysenck & Eysenck, 1975). Therefore, neurotic introverts tend to be more introverted, and neurotic extraverts tend to be more extraverted, when compared to their stable counterparts.<sup>2</sup>

### **Gray's Theory of Personality and Nervous System Function**

Gray (1975, 1982, 1985) has proposed a general theory of personality linked to a conceptual nervous system model that consists of a set of three interacting components: a behavioral activation system (BAS), a behavioral inhibition system (BIS), and a nonspecific arousal system (NAS). The BAS, referred to as the reward system, is responsive to signals of conditioned reward and nonpunishment; activity increases in the presence of such stimuli. The BAS is considered the "go" system and promotes the initiation of goal-directed motor behavior, including approach, escape, and active avoidance (Figure 2).

The BIS, on the other hand, is responsible for organizing reactions to conditioned signals of punishment; signals of frustrative nonreward, and novel or threat stimuli. Frustrative nonreward refers to a context in which a reward is omitted following a response in a situation in which the response had previously been rewarded or in which a reward for the response was anticipated.

The BIS inhibits or decelerates responses that may lead to punishment or nonreward, producing passive avoidance or extinction. In passive avoidance, an organism can avoid receiving punishment or nonreward by not performing a given action (i.e., response suppression).

<sup>2</sup>Eysenck also proposed a third personality dimension known as Psychoticism (P) or "tough-mindedness." This broad personality factor shares many of the impulsive features of the Constraint dimension (reversed) but also includes a predilection for aggressive behavior. These three dimensions, E, N, and P, are measured by the 90-item Eysenck Personality Questionnaire (EPQ; Eysenck & Eysenck, 1975) to be reviewed in the companion article. The EPQ P scale is considered a measure of the constraint dimension (reversed).

The third component of Gray's model, the NAS, serves to prepare or ready the organism to respond to BAS or BIS inputs that have motivational or emotional significance. All three components—the BAS, BIS, and NAS—have been linked to specific neural substrates.

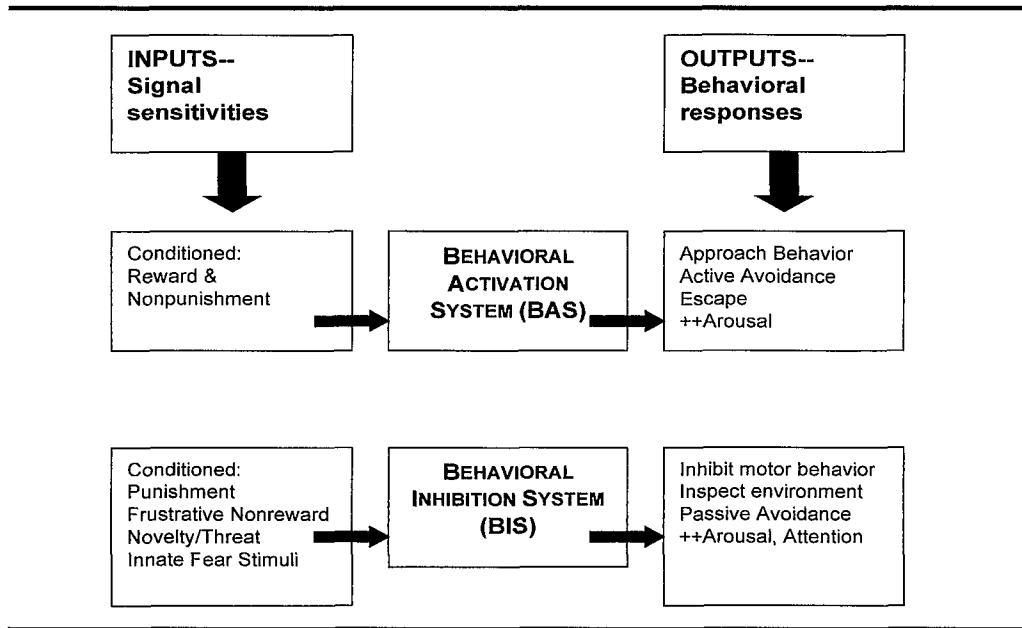
Several particulars regarding Gray's theory should be recognized. First, reciprocal inhibitory inputs connect the two behavioral systems, such that an increase in the activity of one results in a decrease in the activity of the other. Second, an increase in the activity of either behavioral system results in augmented NAS activity via excitatory outputs from the BAS and BIS. Third, the NAS has excitatory connections affecting responses mediated by the behavioral systems, so that as NAS activity increases, the speed and strength of behavioral responses increase proportionately.

### **The Significance of Extraversion and Neuroticism in FD and VN**

Newman and colleagues (Newman & Wallace, 1993a, 1993b; Patterson & Newman, 1993; Wallace & Newman, 1991) proposed a synthesis of Eysenck's and Gray's theoretical formulations to account for breakdowns in self-regulatory behavior observed in disinhibited adults and children. It is an adaptation of this synthesis that provides the foundation for the Roy and Bless (2000) theory of the dispositional bases of FD and VN (see Figure 3).

Briefly, the three components of Gray's model are mapped onto Eysenck's personality dimensions of Extraversion (E) and Neuroticism (N). An individual's position on E reflects the relative strengths of the behavioral systems. For example, in extraverts the BAS is stronger than the BIS, and for introverts the BIS is the stronger of the two systems. Thus, extraverts = BAS dominance = reward sensitive = approach behavior; introverts = BIS dominance = punishment, threat,

**Figure 2.** The signal inputs and behavioral outputs of Gray's (1975, 1982, 1985) behavioral activation and behavioral inhibition systems.



nonreward sensitive = stop/inspect, behavior. Neuroticism directly reflects the reactivity of the NAS: An individual is neurotic by reason of possessing a more reactive (i.e., labile) NAS than a stable individual. Neuroticism augments response tendencies associated with the two behavioral systems; therefore, as N increases extraverts tend to act in a more extraverted manner, and introverts tend to behave in a more introverted manner. In this model, the conjunction of neuroticism and extraversion leads to impulsivity (disinhibition), whereas the combination of neuroticism and introversion leads to anxiety/distress (inhibition). Neurotic extraverts are highly reactive, especially to potential rewards, and initiate goal-directed behavior (e.g., approach).<sup>3</sup> On the other hand, neurotic introverts are highly reactive to threatening and unexpected stimuli, and are prone to engage in BIS-mediated activities (e.g., motor inhibition, inspecting the environment for potential threats, and passive avoidance).

This model and its presumed signal sensitivities and response biases have implications for both FD and VN voice disorders. These implications will be described in the section that follows.

<sup>3</sup>The term *neurotic* as it is employed in this context should not be mistaken as synonymous with the Freudian concept of the neurotic (i.e., an individual with a clinical neurosis). Rather, *neurotic* is used to describe individuals who score above the median on N-sensitive personality measures, such as the Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975) or the Multidimensional Personality Questionnaire (Tellegen, 1982). It should be noted that individuals who are high scorers on N are not necessarily clinically disturbed or even dysfunctional.

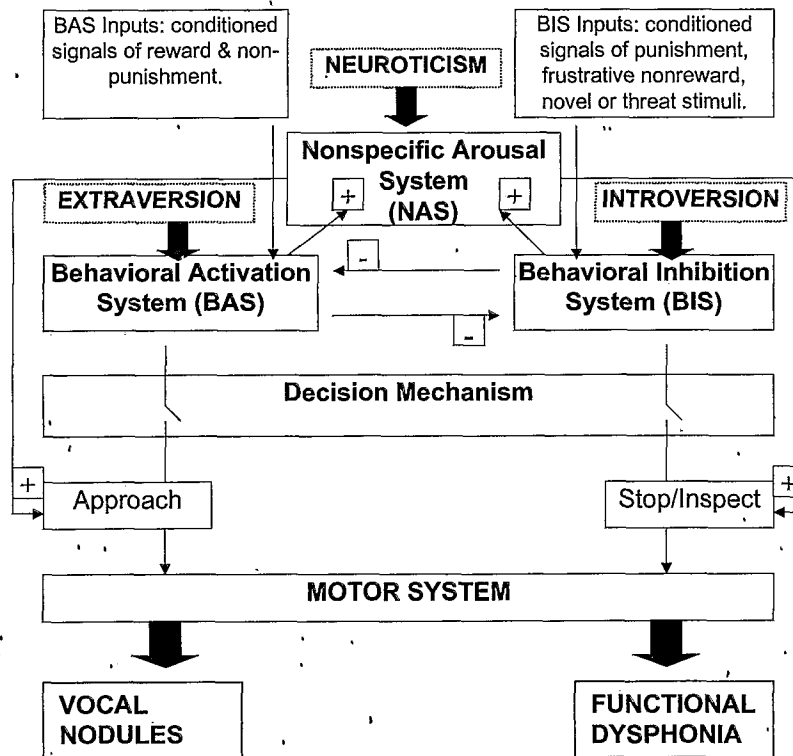
### Applying the Theory to Individuals With FD and VN

Roy and Bless (2000) contend that the signal sensitivities and response biases of BIS-dominated *neurotic introverts* contribute to the development of FD. They hypothesize that FD is related to anxiety, inhibitory laryngeal motor behavior, and elevated laryngeal tension states. According to the theory, elevated neuroticism and low extraversion (high N, low E) should characterize the personality of individuals with FD. Partial or complete voice loss in the absence of structural pathology therefore reflects the cumulative effects of heightened NAS and BIS, with resultant motor inhibition and elevated tension states.

Roy and Bless (2000) also allege that VN development is in part a result of the *impulsive behavior of neurotic extraverts* (i.e., BAS dominance with elevated NAS activity). In spite of the obvious harmful effects (voice change, laryngeal discomfort) of extended voice use and abuse, VN patients often appear unable to engage in appropriate response modulation (i.e., to stop vocal overuse and abuse) in the presence of salient "social" reward cues. Consequently, Roy and Bless reason that VN patients should score high on indices of extraversion (dominance, sociability) and neuroticism (emotional reactivity) and low on measures of constraint (reflecting impulsivity). Neuroticism serves to potentiate the signal sensitivities and response biases of extraversion leading to impulsivity.

To summarize, Roy and Bless (2000) link the disorders of FD and VN to personality differences related to

**Figure 3.** The Roy and Bless (2000) theory of the dispositional bases of vocal nodules and functional dysphonia, adapted from Newman and colleagues synthesis of Eysenck's and Gray's biological theories of personality. The three systems within Gray's conceptual nervous system model are mapped onto E and N. Functional dysphonia and vocal nodules are viewed as behavioral consequences of the signal sensitivities and response biases of BIS dominant neurotic introverts and BAS dominant neurotic extraverts respectively.



dissimilar signal sensitivities and response biases of neurotic introverts and neurotic extraverts, respectively. The hyper-reactivity of the BIS is a prime constituent in the pathogenesis of FD, whereas hyper-reactivity of the BAS is pathogenic in VN development. Both behavioral systems are amplified by the NAS.

In Roy, Bless, and Heisey (2000), the companion article that follows, assessment of these broad personality dimensions is undertaken. Such an evaluation is needed to help clinicians better appreciate the relation among personality, psychological factors, and voice pathology. Until the role of personality in the pathogenesis of voice disorders is better understood, long-term clinical outcomes for these populations may remain unsatisfactory (Bridger & Epstein, 1983; Roy, Bless, Heisey, & Ford, 1997). Improved understanding of its influence could help to explain voice treatment failure and refine treatment strategies in some cases (Gunther, Mayr-Graft, Miller, & Kinzl, 1996). If personality represents a persistent vulnerability for the development, maintenance, and recurrence of certain voice pathologies, then assessment and management practices may need to be revised.

## Acknowledgments

This work was supported in part by the National Center for Voice and Speech through Grant P60 00976 from the National Institute on Deafness and Other Communication Disorders. Parts of this manuscript were presented at the 1997 American Speech-Language-Hearing Association Annual Convention, Boston, MA. The authors gratefully acknowledge Lisa Roteliuk, for her assistance in manuscript preparation.

## References

- Akiskal, H. S., Hirschfeld, R. M. A., & Yerevanian, B. I. (1983). The relationship of personality to affective disorders. *Archives of General Psychiatry*, 40, 801-810.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Arnold, G. A. (1959). Changing interpretations of a persistent affliction. *Logos*, 2, 3-14.
- Arnold, G. A. (1962). Vocal nodules and polyps: Laryngeal tissue reaction to hyperkinetic dysphonia. *Journal of Speech and Hearing Disorders*, 27, 205-217.
- Aronson, A. E. (1990). *Clinical voice disorders: An interdisciplinary approach* (3rd ed.). New York: Thieme.

- Aronson, A. E., Brown, J. R., Litin, M. E., & Pearson, J. S.** (1968). Spastic dysphonia I: Voice, neurologic and psychiatric aspects. *Journal of Speech and Hearing Disorders, 33*, 203-218.
- Aronson, A. E., Peterson, H. W., & Litin, E. M.** (1966). Psychiatric symptomatology in functional dysphonia and aphonia. *Journal of Speech and Hearing Disorders, 31*, 115-127.
- Blitzer, A., Lovelace, R. E., Brin, M. F., Fahn, S., & Fink, M. E.** (1985). Electromyographic findings in focal laryngeal dystonia (spastic dysphonia). *Annals of Otolology, Rhinology, Laryngology, 94*, 591-594.
- Bloch, P.** (1965). Neuro-psychiatric aspects of spastic dysphonia. *Folia Phoniatica, 17*, 301-364.
- Boone, D. R., & McFarlane, S.** (1988). *The voice and voice therapy* (4th ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Bouchayer, M., & Cornut, G.** (1988). Microsurgery for benign lesions of the vocal folds. *Ear, Nose, and Throat Journal, 67*, 446-466.
- Bridger, M. M., & Epstein, R.** (1983). Functional voice disorders: A review of 109 patients. *Journal of Laryngology and Otolology, 97*, 1145-1148.
- Brodnitz, F. S.** (1962). Functional disorders of the voice. In N. M. Levin (Ed.), *Voice and speech disorders: Medical aspects* (pp. 453-481). Springfield, IL: Charles C. Thomas.
- Brodnitz, F. S.** (1976). Spastic dysphonia. *Annals of Otorhinolaryngology, 85*, 210-214.
- Butcher, J. N., Dahlstrom, W. G., Graham, J. R., Tellegen, A., & Kaemmer, B.** (1989). *MMPI-2 (Minnesota Multiphasic Personality Inventory-2): Manual of administration and scoring*. Minneapolis: University of Minnesota Press.
- Butcher, P.** (1995). Psychological processes in psychogenic voice disorder. *European Journal of Disorders of Communication, 30*, 467-474.
- Butcher, P., Elias, A., & Raven, R.** (1993). *Psychogenic voice disorders and cognitive behaviour therapy*. San Diego: Singular Publishing Group.
- Butcher, P., Elias, A., Raven, R., Yeatman, J., & Littlejohns, D.** (1987). Psychogenic voice disorder unresponsive to speech therapy: Psychological characteristics and cognitive-behaviour therapy. *British Journal of Disorders of Communication, 22*, 81-92.
- Cannito, M. P.** (1991). Emotional considerations in spasmodic dysphonia: Psychometric quantification. *Journal of Communicative Disorders, 24*, 313-329.
- Clark, L. A., Watson, D., & Mineka, S.** (1994). Temperament, personality, and the mood and anxiety disorders. *Journal of Abnormal Psychology, 103*, 103-116.
- Colton, R., & Casper, J. K.** (1996). *Understanding voice problems: A physiological perspective for diagnosis and treatment*. Baltimore: Williams & Wilkins.
- Contrada, R. J., Leventhal, H., & O'Leary, A.** (1990). Personality and health. In L. A. Pervin (Ed.), *Handbook of personality theory and research* (pp. 638-669). New York: Guilford Press.
- Cooper, M.** (1973). *Modern techniques of vocal rehabilitation*. Springfield, IL: Charles C. Thomas.
- Cooper, M.** (1980). Recovery from spastic dysphonia by direct voice rehabilitation. In B. J. Urban (Ed.), *The proceedings of the 18th Congress of the International Association of Logopedics and Phoniatics* (Vol. 1). Rockville, MD: American Speech-Language-Hearing Association.
- Diehl, C. F.** (1960). Voice and personality: An evaluation. In D. A. Barbara (Ed.), *Psychological and psychiatric aspects of speech and hearing* (pp. 171-203). Springfield, IL: Charles C. Thomas.
- Digman, J. M., & Takemoto-Chock, N. K.** (1981). Factors in the natural language of personality: Re-analysis and comparison of six major studies. *Multivariate Behavioral Research, 16*, 149-170.
- Deary, I. J., Scott, S., Wilson, I. M., White, A., MacKenzie, K., & Wilson, J. A.** (1997). Personality and psychological distress in dysphonia. *British Journal of Health Psychology, 2*, 333-341.
- Dubovsky, S. L., & Weissberg, M. P.** (1982). *Reactions to illness: In clinical psychiatry in primary care* (2nd ed.). Baltimore: Williams & Wilkins.
- Duckworth, J. C., & Anderson, W. P.** (1995). *MMPI and MMPI-2: Interpretation manual for counselors and clinicians*. Philadelphia: Taylor and Francis Group.
- Eysenck, H. J.** (1967). *Biological basis of personality*. Springfield, IL: Thomas.
- Eysenck, H. J., & Eysenck, M. W.** (1985). *Personality and individual differences: A natural science approach*. New York: Plenum Press.
- Eysenck, H. J., & Eysenck, S. B.** (1975). *Manual of the Eysenck personality questionnaire*. San Diego, CA: Educational and Industrial Testing Service.
- Fex, F., Fex, S., Shiromoto, O., & Hirano, M.** (1994). Acoustic analysis of functional dysphonia: Before and after voice therapy (Accent Method). *Journal of Voice, 8*, 163-167.
- Finitzo, T., & Freeman, F. J.** (1989). Spasmodic dysphonia, whether and where: Results of seven years of research. *Journal of Speech and Hearing Research, 32*, 541-555.
- Friedl, W., Friedrich, G., & Egger, J.** (1990). Personality and coping with stress in patients suffering from functional dysphonia. *Folia Phoniatica, 42*, 144-149.
- Friedl, W., Friedrich, G., Egger, J., & Fitzek, I.** (1993). Psychogenic aspects of functional dysphonia. *Folia Phoniatica, 45*, 10-13.
- Gerritsma, E. J.** (1991). An investigation into some personality characteristics of patients with psychogenic aphonia and dysphonia. *Folia Phoniatica, 43*, 13-20.
- Goldberg, L. R.** (1993). The structure of phenotypic personality traits. *American Psychologist, 48*, 26-34.
- Goldman, S. L., Hargrave, J., Hillman, R. E., Holmberg, E., & Gress, C.** (1996). Stress, anxiety, somatic complaints, and voice use in women with vocal nodules: Preliminary findings. *American Journal of Speech-Language Pathology, 5*, 44-54.
- Graham, J. R.** (1987). *The MMPI: A practical guide* (2nd ed.). New York: Oxford University Press.
- Graham, J. R.** (1990). *MMPI-2: Assessing personality and psychopathology*. New York: Oxford University Press.
- Gray, J. A.** (1975). *Elements of a two process theory of learning*. London: Academic Press.
- Gray, J. A.** (1982). *The neuropsychology of anxiety*. New

- York: Oxford University Press.
- Gray, J. A.** (1985). Issues in the neuro-psychology of anxiety. In A. H. Tuma & J. D. Maser (Eds.), *Anxiety and the anxiety disorders* (pp. 5-25). Hillsdale, NJ: Erlbaum.
- Gray, J. A.** (1987). *The psychology of fear and stress* (2nd ed.). New York: Cambridge Press.
- Green, G.** (1988). The inter-relationship between vocal and psychological characteristics: A literature review. *Australian Journal of Human Communication Disorders*, 16, 31-43.
- Green, G.** (1989). Psychobehavioral characteristics of children with vocal nodules: WPBIC ratings. *Journal of Speech and Hearing Disorders*, 54, 306-312.
- Greene, M. C., & Mathieson, L.** (1989). *The voice and its disorders* (5th ed.). London: Whurr Publishers.
- Gunther, V., Mayr-Graft, A., Miller, C., & Kinzl, H.** (1996). A comparative study of psychological aspects of recurring and non-recurring functional aphonia. *European Archives of Otorhinolaryngology*, 253, 240-244.
- Hathaway, S. R., & McKinley, J. C.** (1972). *The Minnesota Multiphasic Personality Inventory*. New York: Psychological Corporation.
- Heaver, L.** (1960). Spastic dysphonia: A psychosomatic voice disorder. In D. A. Barbara (Ed.), *Psychological and psychiatric aspects of speech and hearing* (pp. 250-263). Springfield, IL: Charles C. Thomas.
- Herrington-Hall, B. L., Lee, L., Stemple, J. C., Niemi, K. R., & McHone, M. M.** (1988). Description of laryngeal pathology by age, sex, and occupation in a treatment-seeking sample. *Journal of Speech and Hearing Disorders*, 53, 57-64.
- Hillman, R. E., Holmberg, E. B., Perkell, J. S., Walsh, M., & Vaughan, C.** (1989). Objective assessment of vocal hyperfunction: An experimental framework and initial results. *Journal of Speech and Hearing Research*, 32, 373-392.
- Hillman, R. E., Holmberg, E. B., Perkell, J. S., Walsh, M., & Vaughan, C.** (1990). Phonatory function associated with hyperfunctionally related vocal fold lesions. *Journal of Voice*, 4, 52-63.
- Holroyd, K. A., & Coyne, J.** (1987). Personality and health in the 1980's: Psychosomatic medicine revisited? *Journal of Personality*, 55, 359-375.
- House, A. O., & Andrews, H. B.** (1987). The psychiatric and social characteristics of patients with functional dysphonia. *Journal of Psychosomatic Research*, 3, 483-490.
- Izdebski, K., Dedo, H. H., & Boles, L.** (1984). Spastic dysphonia: A patient profile of 200 cases. *Journal of Otolaryngology*, 5, 7-14.
- John, O. P.** (1990). The "Big Five" factor taxonomy: Dimension of personality in the natural language and in questionnaires. In L. A. Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 66-100). New York: Guilford Press.
- Kiese-Himmel, C., & Zwirner, P.** (1996). Psychological factors in spasmodic dysphonia. *Laryngorhinootologie*, 75, 397-402.
- Kinzl, J., Biebl, W., & Rauegger, H.** (1988). Functional aphonia: Psychosomatic aspects of diagnosis and therapy. *Folia Phoniatrica*, 40, 131-137.
- Koufman, J. A., & Blalock, P. D.** (1982). Classification and approach to patients with functional voice disorders. *Annals of Otolaryngology, Rhinology, Laryngology*, 91, 372-377.
- Lancer, J. M., Syder, D., Jones, A. S., & Le Boutillier, A.** (1988). The outcome of different management patterns for vocal cord nodules. *Journal of Laryngology and Otolaryngology*, 102, 423-427.
- Liu, C. Y., Yu, J. M., Wang, N. M., Chen, R. S., Chang, H. C., Li, H. Y., Tsai, C. H., Yang, Y. Y., & Lu, C. S.** (1998). Emotional symptoms are secondary to the voice disorder in patients with spasmodic dysphonia. *General Hospital Psychiatry*, 20, 255-259.
- Ludlow, C., Hallett, M., Sedory, S., Fujita, M., & Naughton, R.** (1990). The pathophysiology of spasmodic dysphonia and its modification by botulinum toxin. In A. Beradelli, R. Benecke, M. Manfredi, & C. Marsden (Eds.), *Motor disturbances II* (pp. 274-288). Orlando: Academic Press Inc.
- Marks, P. A., Seeman, W., & Haller, D. L.** (1974). *The actuarial use of the MMPI with adolescents and adults*. Baltimore: Williams & Wilkins Co.
- Milutinovic, Z.** (1991). Inflammatory changes as a risk factor in the development of phononeurosis. *Folia Phoniatrica*, 43, 177-180.
- Morrison, M. D., Nichol, H., & Rammage, L. A.** (1986). Diagnostic criteria in functional dysphonia. *Laryngoscope*, 94, 1-8.
- Morrison, M. D., & Rammage, L. A.** (1993). Muscle misuse voice disorders: Description and classification. *Acta Otolaryngologica (Stockh)*, 113, 428-434.
- Mosby, D. P.** (1970). Psychotherapy versus voice therapy for a child with a deviant voice: A case study. *Perceptual Motor Skills*, 887-891.
- Moses, P. J.** (1954). *The voice of neurosis*. New York: Grune & Stratton.
- Murry, T., Cannito, M. P., & Woodson, G. E.** (1994). Spasmodic dysphonia: Emotional status and botulinum toxin treatment. *Archives of Otolaryngology, Head and Neck Surgery*, 120, 310-316.
- Murry, T., & Woodson, G.** (1992). Comparison of three methods for the management of vocal fold nodules. *Journal of Voice*, 6, 271-276.
- Nagata, K., Kurita, S., Yasumoto, S., Maeda, T., Kawasaki, H., & Hirano, M.** (1983). Vocal fold polyps and nodules: A 10 year review of 1,156 patients. *Auris, Nasus, Larynx*, 10(Suppl.), S27-S35.
- Nemec, J.** (1961). The motivation background of hyperkinetic dysphonia in children: A contribution to psychologic research in phoniatry. *LOGOS*, 4, 28-31.
- Nemiah, J. C.** (1961). Psychological complications of physical illness. In *Foundations of psychopathology*. New York: Oxford University Press.
- Newman, J. P., & Wallace, J. F.** (1993a). Diverse pathways to deficient self-regulation: Implications for disinhibitory psychopathology in children. *Clinical Psychology Review*, 13, 699-720.
- Newman, J. P., & Wallace, J. F.** (1993b). *Cognition and psychopathy in psychopathology and cognition*. New York: Academic Press.

- Newmark, C. S.** (1979). *MMPI clinical and research trends*. New York: Praeger.
- Nichol, H., Morrison, M. D., & Rammage, L. A.** (1993). Interdisciplinary approach to functional voice disorders: The psychiatrist's role. *Otolaryngology Head and Neck Surgery, 108*, 643-647.
- Patterson, C. M., & Newman, J. P.** (1993). Reflectivity and learning from aversive events: Toward a psychological mechanism for the syndromes of disinhibition. *Psychological Review, 4*, 716-736.
- Peter, F., & Brandell, M. E.** (1980). *A study on the self-concept of children with vocal nodules*. Paper presented at the ASHA convention, Detroit, MI.
- Peterson, C.** (1988). *Personality*. Orlando, FL: Harcourt, Brace, Jovanovich.
- Pfau, E. M.** (1975). Psychologische untersuchungsergebnisse sur atologie der psychogenen dysphonien. *Folia Phoniatica, 25*, 298-306.
- Plomin, R., Loehlin, J. C., & Defries, J. C.** (1985). Genetic and environmental components of "environmental" influences. *Developmental Psychology, 21*, 391-402.
- Rammage, L. A., Nichol, H., & Morrison, M. D.** (1987). The psychopathology of voice disorders. *Human Communications Canada, 11*, 21-25.
- Reiser, D. E.** (1980). Reactions to illness. In D. E. Reiser & A. K. Schroder (Eds.), *Patient interviewing: The human dimension* (pp. ). Baltimore: Williams & Wilkins.
- Roy, N., & Bless, D. M.** (2000). Toward a theory of the dispositional bases of functional dysphonia and vocal nodules: Exploring the role of personality and emotional adjustment. In R. D. Kent & M. J. Ball (Eds.), *The handbook of voice quality measurement* (pp. 461-480). San Diego: Singular Publishing Group.
- Roy, N., Bless, D. M., & Heisey, D.** (2000). Personality and voice disorders: A superfactor trait analysis. *Journal of Speech, Language, and Hearing Research, 43*, 749-768.
- Roy, N., Bless, D. M., Heisey, D., & Ford, C. F.** (1997). Manual circumlaryngeal therapy for functional dysphonia: An evaluation of short- and long-term treatment outcomes. *Journal of Voice, 11*, 321-331.
- Roy, N., & Leeper, H. A.** (1993). Effects of the manual laryngeal musculoskeletal tension reduction technique as a treatment for functional voice disorders: Perceptual and acoustic measures. *Journal of Voice, 7*, 242-249.
- Roy, N., McGrory, J. J., & Bless, D. M.** (1995). *Psychological correlates of patients with vocal nodules*. Paper presented at the ASHA convention, New Orleans, LA.
- Roy, N., McGrory, J. J., Tasko, S. M., Bless, D. M., Heisey, D., & Ford, C. N.** (1997). Psychological correlates of functional dysphonia: An evaluation using the Minnesota Multiphasic Personality Inventory. *Journal of Voice, 11*, 443-451.
- Schalen, L., & Andersson, K.** (1992). Differential diagnosis and treatment of psychogenic voice disorder. *Clinical Otolaryngology, 17*, 225-230.
- Smith, T. W., & Williams, P. G.** (1992). Personality and health: Advantages and disadvantages of the 5-factor model. *Journal of Personality, 60*, 395-423.
- Stemple, J. C.** (1984). *Clinical voice pathology: Theory and management*. Columbus: Charles E. Merrill.
- Stemple, J. C.** (1993). *Voice therapy: Clinical studies*. St. Louis: Mosby Year Book.
- Stone, S. V., & Costa, P. T., Jr.** (1990). Disease-prone personality or distress-prone personality? The role of neuroticism in coronary heart disease. In H. S. Friedman (Ed.), *Personality and disease* (pp. 178-202). New York: Wiley.
- Suls, J., & Rittenhouse, J. D.** (1990). Models of linkages between personality and disease. In H. S. Friedman (Ed.), *Personality and disease* (pp. 38-64). New York: Wiley.
- Tellegen, A.** (1982). *Brief manual for the multidimensional personality questionnaire*. Unpublished manuscript, University of Minnesota, Minneapolis.
- Tellegen, A.** (1985). Structures of mood and personality and their relevance to assessing anxiety, with an emphasis on self-report. In A. H. Tuma & J. D. Maser (Eds.), *Anxiety and the anxiety disorders* (pp. 681-706). Hillsdale, NJ: Erlbaum.
- Toohill, R. J.** (1975). The psychosomatic aspects of children with vocal nodules. *Archives of Otolaryngology, 101*, 591-595.
- Verdolini-Marston, K. L., Burke, M. K., Lessac, A., Glaze, L., & Caldwell, E.** (1995). Preliminary study of two methods of treatment for laryngeal nodules. *Journal of Voice, 9*, 74-85.
- Wallace, J. F., & Newman, J. P.** (1991). Failures of response modulation: Impulsive behavior in anxious and impulsive individuals. *Journal of Research in Personality, 25*, 23-44.
- Watson, D., Clark, L. A., & Harkness, A. R.** (1994). Structures of personality and their relevance to psychopathology. *Journal of Abnormal Psychology, 103*, 18-31.
- White, A., Deary, I. J., Wilson, J. A.** (1997). Psychiatric disturbance and personality traits in dysphonic patients. *European Journal of Disorders of Communication, 32*, 121-128.
- Wilson, D. K.** (1987). *Voice problems of children* (3<sup>rd</sup> ed.). Baltimore, MD: Williams & Wilkins.
- Wilson, F. B.** (1971). Emotional stress may cause voice anomalies in kids. *Journal of the American Medical Association, 216*, 2085.
- Wilson, F. B., & Lamb, M.** (1974) Comparison of personality characteristics of children with and without vocal nodules based on Rorschach Protocol Interpretation. *Acta Symbolica, 43*-55.
- Withers, B. T., & Dawson, M. H.** (1960). Psychological aspects: Treatment of vocal nodule cases. *Texas State Journal of Medicine, 56*, 43-46.
- Yano, J. L., Ichimura, K., Hoshino, T., & Nozue, M.** (1982). Personality factors in the pathogenesis of polyps and nodules of the vocal cords. *Auris, Nasus, Larynx, 9*, 105-110.

Received April 14, 1999

Accepted October 26, 1999

Contact author: Nelson Roy, PhD, Department of Communication Disorders, University of Utah, 390 South 1530 East, Room 1219, Salt Lake City, UT 84112-0252.  
Email: nelson.roy@health.utah.edu

A vertical bar on the left side of the page, consisting of a series of yellow and orange rectangular segments. A small red diamond is at the top left corner of the bar.

COPYRIGHT INFORMATION

TITLE: Personality traits and psychological factors in voice pathology: a foundation for future research

SOURCE: Journal of Speech, Language, and Hearing Research 43  
no3 Je 2000

WN: 0015305579013

(C) The American-Speech-Language-Hearing Association is the publisher of this article and holder of the copyright. Further reproduction of this article in violation of copyright is prohibited without the consent of the publisher. To contact the publisher: <http://www.asha.org/>.

Copyright 1982-2002 The H.W. Wilson Company. All rights reserved.