PARALINGUISTIC CUES IN THE SPEECH OF WITHDRAWN CHILDREN

by

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Abstract

Thirty withdrawn \( (n = 15) \) and non-withdrawn \( (n = 15) \) Prince George school children from grades two to seven performed a public speech before their peers and an experimenter. The groups of children were compared in terms of paralinguistic vocal characteristics (mean speech production to total episode ratio, mean duration of pauses, filled pausing rate and mean variation of vocal pitch) and self report measures of social support and trait anxiety. Withdrawn children exhibited less speech and longer mean pause duration within the episode and reported lower levels of social support and higher levels of trait anxiety than did nonwithdrawn children. Paralinguistically, the relatively excessive silence and longer mean pause duration exhibited by the withdrawn children constitutes a qualitative rather than merely a quantitative behavioural difference from the non-withdrawn children. As excessive pausing is viewed as “unnattractive” by listeners (Siegman, 1987), the implications of passive and nonfluent vocal styles on peer acceptance are discussed.
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CHAPTER I

Paralinguistic Cues in the Speech

of Withdrawn Children

Background Literature

Children's Social Development

One of the most important contributions to a child's social development is the quality of his or her interactions with members of the peer group (Rubin, LeMare, & Lollis, 1990). For example, research has indicated that relationships with peers affect children's social competence, social perspective taking, self esteem, as well as their school performance and relationships with adults (Asher, 1990; Coie, Dodge, & Kuperschmidt, 1990). Much attention in the literature has focused on identifying children who have difficulties interacting with their peers. This research has determined that children who have "maladaptive" interpersonal styles may be at risk for social rejection (Coie, Dodge, & Coppotelli, 1982; Rubin, LeMare, & Lollis, 1990). Specifically, children who demonstrate constellations of behaviours that are either "aggressive" or "socially withdrawn" tend to be disliked by their peers. Previous researchers have attempted to isolate the specific behaviours that make up these two interpersonal patterns by focusing on overt actions that these children perform while interacting with their peers (Asher & Hymel, 1981; Coie, Dodge, & Coppotelli, 1982; Rubin, LeMare, & Lollis, 1990). Although this research has revealed specific behaviours that make up the aggressive interpersonal style, fewer studies have focused on the behaviours that make up the withdrawn interpersonal style. The goal of the present research is to add to the body of literature on peer relations by studying the more subtle nonverbal behaviours
displayed by socially withdrawn children.

**Social Withdrawal**

Social withdrawal, inhibition, and shyness are terms used interchangeably to describe a child who produces “high frequencies of nonsocial behaviour while in an ostensibly social situation” (Coplan, Rubin, Fox, Calkins, & Stewart, 1994, p. 129).

Several procedures have been developed to identify withdrawn children within the peer group. Most of the techniques tend to rely on subjective measures of peer or teacher perceptions of the child’s social behaviour in school settings (Rubin, LeMare, & Lollis, 1990). Other techniques involve parental ratings of children’s behaviour. Yet, the consensus is that since peers are involved with each other in daily social interactions, they are the best assessors of peer standing or what is referred to in the literature as sociometric status (Coie, Dodge, & Kuperschmidt, 1990, Masten, Morison, & Pelligrini, 1985; Younger & Daniels, 1992).

**Sociometrics**

A child’s sociometric status (i.e., his or her standing in the peer group) is determined by having all children in a school classroom identify the three or more children whom they like the most in their class and the three children whom they like the least in their class (Coie, Dodge, & Coppotelli, 1982). Researchers determine a child’s status based on the number of positive and negative nominations received from his or her classmates. This procedure results in five possible peer status categories: popular (children who tend to be liked by most classmates), average (children who are liked by some classmates), rejected (children who are disliked by most classmates), controversial (children who are liked and disliked by some classmates), and neglected
(children who do not tend to be nominated as either liked or disliked). Most children end up in the average category. Relatively few children (typically one or two per class) are disliked or neglected.

In addition to asking children whom they like and dislike, researchers also ask children to identify other children in their peer group (classroom) who fit with various behavioural descriptors using a procedure called the Revised Class Play (RCP; Masten, Morison, & Pelligrini, 1985, see Appendix A). This technique is used to identify children who are seen by their peers as demonstrating particular social behaviours. For example, children are asked to nominate classmates who are helpful, shy or angry (see Appendix A). Based on the number of nominations each child receives on each item, target children who are highly aggressive or highly withdrawn are identified.

Social withdrawal, as a sociometric construct, has been challenged on the grounds that “social withdrawal items do not cluster into a well-defined, homogeneous factor underlying the peer nominations of young, school-aged children, as is the case with their ratings of aggression” (Younger & Daniels, 1992, p. 955). Instead, the construct of social withdrawal in school-aged children refers to a more heterogeneous population made up of active isolation and passive withdrawal. Differentiating between passive withdrawal and active isolation is vital because although both types of behavioural constellations would be considered “non-social” in that there is reduced social interaction with peers, passive withdrawal is associated more often with shy or reticent behaviour whereas active isolation refers to more overt ostracization from the peer group (Younger & Daniels, 1992). Contemporary sociometric techniques have each child identify classmates who are “very shy” and “who would rather play alone”
(the two items on the RCP that best describe the behavioural characteristics of passive withdrawal as defined by Younger & Daniels, 1992). A child is considered socially withdrawn if he or she receives higher than average nominations on a composite standardized score on both items. In most cases, children who are nominated by their peers as socially withdrawn also tend to be classified as either neglected or rejected (Boivin, Hymel, & Bukowski, 1995). This finding is important as it reinforces the belief that withdrawn or shy behaviour within the peer group may lead to exclusion from the peer group.

Withdrawn Communicative Behaviour

There is a small body of research that has examined the overt behaviours of children who are nominated by their peers as socially withdrawn. Much of that research has focused on young children and usually kindergarten and preschool-age children (Rubin, 1985). Withdrawn children of this age group engage in more immature forms of play and receive fewer social 'proposals' than do non-withdrawn age-mates (Rubin, 1982). In dyadic communication, withdrawn children are likely to produce fewer commands, and their social requests are less likely to result in compliance than those of more sociable children (Rubin & Borwick, 1984). To examine nonverbal communicative behaviours, Coplan et al. (1994) had withdrawn and nonwithdrawn preschool children perform a speech in front of peers. The study included, as part of an aggregate variable, the length of each child's speech and the proportion of the episode during which the child was actually speaking. The results of the study indicated that withdrawn children talked less than their nonwithdrawn peers. Similarly, Asendorpf and Meier (1993) found that second grade children who were judged by their parents as
shy, spoke less than non-shy children in unfamiliar situations. These results confirm that the behavioural constellation of shyness or withdrawal involves restrained or more passive communication with peers.

Reticence and Speech

Thus, there is evidence that children identified as withdrawn are somewhat reticent when speaking before their peers. Although it is assumed that withdrawn children have social skills difficulties (Rubin, LeMare, & Lollis, 1990) and that may be why they do not interact well with their peers, little research has examined the quality of withdrawn children’s communicative behaviours while interacting with their peers. Research which has focused specifically on reticence in children and adults reveals that individuals who are reticent tend to produce nonfluent speech (i.e., it lacks smoothness). For example, Phillips (1968) found that reticent speakers tend to hesitate more within an utterance than do nonreticent speakers. More recently, Van Kleek and Street (1982) found that when reticent three-year-olds interacted with adults, they talked less and used shorter utterances than did talkative children. The Van Kleek and Street finding can be considered circular in that the very definition of reticence involves an unwillingness to speak in social situations. The results of this study may be best considered as affirmations of characteristics of withdrawn or shy children. However, Phillips' (1968) finding suggests that there is an actual perceptible disruption in reticent speakers’ speech and not just less speech overall.

Introversion and Speech

Another factor that appears to be associated with non-fluent production of speech, and which provides information that may be relevant for the study of socially
withdrawn children, is the personality characteristic of introversion. “Jung (1923, 1976), often credited with formulating the constructs [introversion and extraversion], described the public appearance of extraverts as outgoing and sociable and that of introverts as reserved, inscrutable and shy” (Thorne, 1987, p. 718). Empirical studies focused on validating the constructs have shown that introverts exhibit more disrupted speech than do extroverts (Mallory & Miller, 1958; Markel, Phillis, Vargas, & Harvard, 1972; Ramsay, 1966, 1968; Scherer, 1979; Scherer & Scherer, 1981; Siegman, 1978; Snyder, 1974; Trimboli, 1973). For example, Ramsay (1966, 1968) found that introverts exhibited longer silent pauses within utterances than extraverts. Similarly, Scherer (1979; Scherer & Scherer, 1981) found that introverts tend to speak less forcefully than do extraverts, and several researchers have found introverts to speak less overall than extraverts (Campbell & Rushton, 1978; Patterson & Holmes, 1966).

Anxiety and Speech

It is possible that the speech of both reticent and socially withdrawn individuals is disrupted because of high levels of discomfort or anxiety when engaged in social situations. Several researchers have found that state anxiety appears to affect the paralinguistic cues that accompany speech (Feldstein, Brenner, & Jaffe, 1963; Fenz & Epstein, 1962; Kanfer, 1958; Kimble & Seidel, 1991; Mahl, 1956; Murray, 1971; Pope, Blass, Siegman, & Raher, 1970; Pope, Siegman, & Blass, 1970; Siegman, 1978). For example, Mahl's (1956) early work examined the assumption that state anxiety has a disruptive effect on the normal flow of speech by using a paradigm that consisted of observing clinical patients in low (non-provocative interview) and high anxiety interviews (highly personal and provocative interview) and analysing their speech for various
verbal disturbances including repetition, sentence incompleteness, omission, tongue slip, stutter, incoherent sounds, and filled pauses (e.g., “uh”, “er” etc.). The results of that research indicated that the speech of the patients had more verbal disturbances and a higher rate of pauses in the high anxiety interview than those in the low anxiety interviews. Other research supports Mahl’s finding that state anxiety tends to interfere with the fluency of speech (Cook, 1969; Kasl & Mahl, 1965; Siegman & Pope, 1965). Mahl’s sample was composed of psychiatric patients, so caution must be made in extending these findings to a non-psychiatric population.

The early research on the influence of state anxiety (e.g., Mahl, 1956) on speech was criticized for confounding anxiety with the emotional content of the speech. That is, it is possible that because of the more provocative nature of the high anxiety interview (i.e., the subject matter that brings about higher anxiety is likely to be more personal to the patient), topical focus and anxiety may be confounded. This possible confound was controlled in a study Pope, Siegman, and Blass (1970) which separated the topic of the interview from the anxiety state. In this study, college students participated in an initial interview. After the initial interview, the control subjects were asked to return to repeat the interview because the experimenters had accidentally destroyed the tape of the interview, and the experimental subjects were told (falsely) that they were to return because their initial interview indicated serious psychological disturbance. The control subjects were expected to exhibit decreased speech disturbances in the second interview because of the practice effect, whereas the experimental subjects were expected to exhibit increased speech disturbances in the second interview because their level of anxiety would have presumably increased due
to being told that they had psychological problems. The results of the study supported both of these predictions, indicating that the increased level of state anxiety was associated with an increase in speech disturbances even when the topic was controlled. This finding offers strong support for the notion that increased levels of state anxiety are associated with an increase in speech disturbances.

As for the association between more stable or trait anxiety and the fluent production of speech, research has shown that people who report higher trait anxiety produce more frequent longer pauses than those who report lower trait anxiety (Helfrich & Dahme, 1974; Siegman, 1978). Siegman (1978) proposed a curvilinear relationship between anxiety and speech tempo. Siegman found that under mild and moderate anxiety levels, subjects’ speech tempo was accelerated, with faster speech rates and fewer pauses. Subjects under very high levels of stress, however, displayed a much slower speech rate and longer pauses. The result is an inverted-U shaped relationship between speech rate and anxiety; a more specific application of the Yerkes-Dodson law that suggests that under moderate stress, performance is facilitated and under high stress, performance suffers. The rationale is that people who report higher trait anxiety are already further “down” the x-axis of the curve; thus, when they engage in a threatening or stressful situation, they are more likely to produce nonfluent speech.

Siegman (1978) offers two possible and related explanations for the anxious speaker’s longer pause duration: (1) to allow the anxious speaker to cognitively plan the content of their speech or (2) the stress of the speech episode may hinder the speaker’s ability to think “on one’s feet”, thus pause duration increases. Helfrich & Dahme (1974) assert that the longer pause duration exhibited by high trait anxiety
speakers is due to their need to seek verbal and nonverbal feedback from their audience. They use the longer silences to scan the reactions of their audiences to the speech. Regardless of the purpose of the longer pause duration exhibited by high trait anxiety speakers, it is apparent that anxiety has a disruptive effect on the production of fluent speech.

It is important to note, however, that not all research findings support the inverted-U relationship theory of speech tempo and anxiety. For example, Pope, Blass, Siegman, and Raher (1970) compared the speech of six psychiatric patients on their most and least anxious days. The researchers compared the patients' speech rates and silences and found that, contrary to the inverted-U hypothesis, on highly anxious days, the patients displayed faster speech tempos and shorter silent periods. This finding should be viewed with caution, taking into consideration the small group size, and the fact that the subjects were from a psychiatric sample, thus making extrapolation to normal subjects problematic. If we also take Siegman's inverted-U hypothesis into consideration, the result may be explained by assuming that the subjects simply were not anxious enough to exhibit the disrupted speech.

Siegman (1987) suggests that task complexity may explain the discrepancy in the findings: "The same level of anxiety arousal that facilitates simple learning tasks (tasks in which the predominant response is the correct one) will interfere with complex learning tasks (tasks that elicit competing response tendencies)" (p. 388). This suggestion is supported by research on the influence of anxiety on public speaking (a complex and stressful task). Levin and Silverman (1965) asked participants to narrate a story either in front of an audience or by themselves. Examinations of the
participants' speeches revealed that those who performed the speech before an audience produced more pauses (greater than one second) and more filled pauses than those who spoke alone. Similarly, Reynolds and Paivio (1968) found that students who scored highly on a measure of audience sensitivity exhibited more silence while speaking to a large audience than when speaking to an individual, again, supporting the assumption that anxiety has a disruptive effect on the normal flow of speech. In terms of Siegman's (1987) assertion regarding both the inverted-U relationship between anxiety and speech rate and how the complexity of a given task affects the fluent production of speech, a suitable experimental arena to observe the possible effects of anxiety on vocal production would involve subjects creating an impromptu speech before peers, wherein, presumably, both audience anxiety and cognitive complexity (producing an unrehearsed speech concerning a personal experience as opposed to merely recounting a narrative) would be possible mitigating factors.

**Physiological Speech Correlates**

Departing from what can be considered behavioural vocal characteristics of introversion, anxiety and discomfort, more direct physiological measures of paralinguistic cues deserve some consideration. Fundamental frequency (f0) of a vocalization is analogous to the pitch of a sound. The variability of f0 is operationally defined as the standard deviation of pitch and is perceived as intonation. Past research has found that extroverted subjects exhibit greater variability of f0 (f0V) within a speech episode than do introverts (Addington, 1968; Scherer, 1979). That is, extroverts tend to have more variation or vocal animation in their speech than do introverts. Introverts' speech, in contrast, would seem more monotonic and lacking in f0 variation.
Perceptions of Speech by Others

A natural extension of the study of disrupted speech behaviour is an examination of how this "unattractive" nonverbal behaviour is perceived by others. Research provides evidence that people form positive or negative impressions of others based on subtle features of their speech (Pike, 1945; Siegman, 1978; 1987). There is a substantial body of research which has examined the specific nonverbal cues that appear to influence people's perceptions of others. Among these nonverbal cues are many of the characteristics that have been discussed as being related to social withdrawal/reticence/anxiety and speech style: speech rate (how fast a person talks), pausing (typical length of within and between utterance pauses), and loudness. For example, speakers who exhibit fast speech rates are judged by people from Western cultures as being more confident, sociable, and trustworthy than those with slow speech rates (Miller, Maramaya, Beaber, & Valone, 1976; Street, Brady, & Putnam, 1983), and those who speak more loudly are judged as more assertive than those who speak softly (Rose & Tryton, 1979). Furthermore, those who exhibit short within- and between-utterance pauses are judged more favourably than those who use longer pauses (Siegman & Reynolds, 1982; Street, 1982). Scherer (1979) found that speakers who incorporated high f0 variability were judged as dynamic, extroverted, and having an outgoing personality. Following these findings, it is possible that part of the reason that withdrawn children tend to be neglected or rejected by their peers is because they exhibit nonfluent speech characteristics such as slow speech rate and long pauses which are judged by others as unacceptable or unattractive. Keeping the bi-directionality of causality in mind, it is also possible that children who are neglected or
rejected by their peers develop nonfluent speech characteristics as a result of inadequate peer interactions. Regardless of the direction of causality, "unattractive" vocal characteristics may play a role in peer assessments of social behaviour.

**Overview of the Present Study**

The purpose of the present study was to determine whether the passively withdrawn subgroup of socially withdrawn children, as identified by sociometric procedures, exhibit nonverbal speech characteristics that are different from children who are judged as "average" in terms of peer status. It was hypothesized that the withdrawn children would exhibit less speech than average peers when performing a speech to a peer audience, and also longer pause durations, and more filled pauses than would the average children. It was further hypothesized that the withdrawn children would exhibit a smaller variation in fundamental frequency than the average children, based on Scherer's (1982) assertion that extroverted people exhibit more intonational variation when they speak while introverted people tend to exhibit a more monotonic intonation. It was further hypothesized that the relevant speech characteristics of socially withdrawn children would be meaningfully related to a self report measure of trait anxiety and social support (see Table 1), and that the withdrawn children would report lower social support and higher trait anxiety than would the control children.
Table 1

Expected relationships between the self report measures and the dependent variables for the withdrawn children.

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<tr>
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<th>Social Support</th>
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<tr>
<td>Amount of Speech</td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>F0V</td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>Mean pause duration</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>Filled pause rate</td>
<td>Negative</td>
<td>Positive</td>
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CHAPTER II
Method

Participants and Sociometric Techniques

Fifteen withdrawn children and 15 nonwithdrawn (average) children from grades two through seven were selected from two Prince George elementary schools (Blackburn Elementary and College Heights Elementary). The reason children in grades two to seven were targeted is that the sample came from a larger project examining physiological correlates of styles of social behaviour. Only children who received parental permission to participate were included in the study. Withdrawn (passively) children were identified by the use of two questions from the Revised Class Play questionnaire, or RCP (Masten, Morison, & Pellegrini, 1985) which has been shown to be a valid instrument in sociometric nomination procedures (Younger & Daniels, 1992). The children were provided with a class list and were asked to indicate three (or more if preferred) classmates who best fit each behavioural description (see Appendix A). The total number of withdrawn nominations were computed as the sum of the nominations on the RCP items: “Who is very shy?” and “Who would rather play alone than with others?”. The total number of withdrawn item nominations were standardized within each class. A standardized score (Z-score) of 1.0 or higher on the composite of the withdrawal items identified the child as withdrawn (cf. Boivin, Hymel, & Bukowski, 1995).

In addition, each withdrawn child was identified as either rejected or neglected by is or her Social Preference (SP) and Social Impact (SI) scores. SP and SI were calculated by the child’s nominations on two other items from the RCP. Specifically, the
children were asked to indicate the classmates they “Like to spend time with the most” (LM) and those they “Like to spend time with the least” (LL) (see Appendix A). A child who had a SP (LM-LL) that was less than -1.0, a LM score that was less than 0, and a LL score that was greater than 0 was identified as “rejected”. A child who had a SI (LM+LL) score that was less than -1.0, and LM and LL scores that were less than 0 was identified as “neglected”. Popular children were those who had a SP > 1, a LM > 0, and a LL score less than 0, and controversial children were those who had a SI > 1 and LL and LM scores > 0 (these children were not considered in the present study).

Children who did not fit any of the above criteria were designated as “average” (e.g., Coie & Dodge, 1988; Coie, Dodge, & Coppotelli, 1983). Withdrawn children were matched with average children in terms of gender and age for comparison. The children were not aware of their own or their classmates’ statuses; therefore emotional duress to the participants resulting from this assessment was presumably minimal.

**Procedure**

Each child was audio- and video-taped (as part of the larger study) while giving a three minute speech in front of peers about what took place during their last birthday (cf. Coplan et al., 1994). The research took place in a research trailer set up at each of the two schools. Groups (quads) of four children (one withdrawn, one aggressive, and two target control children) were taken from their classrooms to the research trailer. Each aggressive and withdrawn child was paired in the quad with their target control child-a child matched for gender and as closely as possible in terms of age. Target control children were determined before the task began. Whenever possible, the children were members of different classrooms and were not close friends. This
precaution controlled for two possible problems: (1) the lack of familiarity with the other members of the quad ensured that the speech was more formal and not a conversation with friends, and (2) to benefit coding procedures as the children would presumably be less likely to interrupt with personal anecdotes, thus making the pre-screening process more straightforward (i.e., if one of the quad mates actually attended the speaker's birthday, he or she may be more likely to interject with personal anecdotes about their experience of the party, thus reducing the total time the target speaker was actually speaking). The children were asked, one at a time, to give a speech to the others about what happened on his or her birthday (or other holiday/happy event). The speaker was seated in a chair in front of a two-way mirror, with the rest of the group sitting on the floor in front of the speaker (a modified procedure of that used by Coplan et al., 1994, see Figure 1 for room layout). As depicted in Figure 1, the speaker was situated in such a way that they could see themselves and the experimenter in the two-way mirror, as well as his or her audience before them. This situation was designed to evoke maximum audience anxiety given the relatively small experimental trailer.

If the child finished his or her story before the three minute time limit, they were prompted by the experimenter to talk about another happy event until the three minutes had elapsed. Other measures such as heart rate and blood pressure were taken at the same time but were not considered within the present study. The speeches were audio taped via a® Shure Presenter WL93 lapel microphone and a® Sony Professional Walkman. Participants who were ESL (English as a Second Language), physically or mentally handicapped or had speech or language disorders were identified by the teachers and were not included in the present study.
Variable Coding

The three minute speech episode for each child was analysed via the ®SIGNAL and ®SPAM (Speech Parameter Automatic Measurement) digital signal processing system, designed by Engineering Design, a computer design company based in Belmont, MA, USA. ®SIGNAL analyzes sounds by first converting them from voltages to numbers (digitization) and then performing mathematical operations on the numbers. A JVC tape deck was connected to an Analog I/O (input/output) Board. ®SIGNAL controls this board to digitize the sounds and store them in CPU memory. Sounds are then analyzed from the CPU memory through ®SIGNAL commands. The ®SPAM system, designed especially for this project, is an upgrade of the original ®SIGNAL system designed to analyse the variables of interest in the present study. The recording level of the stereo tape recorder was set at 50% of maximum for all children. The lapel microphone was attached by the experimenter to the left upper chest of the each participant to record their speeches. Because the location of the lapel microphone was not exactly the same for each participant, vocal intensity (amplitude) could not be reliably measured and will not be considered in the analyses. As the microphone location varied for some of the participants, some of the signals had their intensity boosted to allow for analysis, yet another reason why intensity of vocalization was not considered in the present study. Boosting the intensity of a signal does not affect the signal characteristics of the variables of interest (pausing, filled pauses, fO variation) in the present study. The various speech characteristics were identified as:

Speech to total time ratio refers to the proportion of time the child was
vocalizing within the speech episode excluding interruptions. The
variable is a ratio of the total time spent in speech, including filled pauses.
This variable is calculated automatically by the ®SPAM system. See
Figure 2 for pausing wave.
Mean pause duration refers to the average length of the between-
and within-utterance pauses in the speech episode. Mean pause duration
was calculated by dividing each child's total silence quotient (1 minus
Speech to total ratio) by the number of between- and within-utterance
pauses in each speech episode (see Figure 2).
Number of filled pauses as per amount of speech refers to the number of
times a child uses a nonlinguistic "word" such as "uhm", "er" or "uh" as a
function of their average speech to total time ratio. Only those filled
pauses that occurred within the analysis portion of the three minute
episode were included in the analyses. The filled pauses were identified
by replaying the signal waves and identifying the filled pauses.
Variation of f0 refers to the average variation of the pitch or fundamental
frequency of the speech episode. F0V is expressed in Volts RMS (Root
mean squared).

Each three minute speech episode was pre-screened to ensure that the vocal
data was only that of the target speaker and not of the experimenter or the audience.
For example, if a child spoke for 35 seconds and then was interrupted by either the
experimenter or a quad mate, the 35 second sample was run through the ®SPAM
program and the variables of interest were examined. The interruption was not
Ratio of speech duration to total duration = 0.4270

Speech signal divided into intervals of speech (in boxes) and silence
included in the analysis (see Figure 3 for diagram of usable data management). If a subject answered a question within the speech episode from either the experimenter or a quad mate this data was also excluded on the grounds that the subject was not engaged in a public speech per se, but was answering a question. Sounds such as microphone knocks and breathing sounds were identified in the pre-screening process and were eliminated from the analysis as per the suggestion of Kim Beeman, the computer engineer who designed the @SIGNAL and @SPAM vocal data system (personal communication, August 15, 1997).

When the vocal data were introduced to the @SPAM system, the vocalization was depicted on screen as a signal wave (see Figure 4). At this time, F1 “jumps” were located on the signal wave and modified to fit the pitch wave. F1 jumps, harmonic artifacts of the f0, often occur in vocal data. Areas of the pitch contour that appeared to jump from the fundamental frequency to its harmonic were inspected by examining the spectrograph display and determining whether there were two identical “marks” directly below the peak. The area where the f0 jump was located was delimited and divided by 2 (automatically by the @SPAM system) as per the suggestion of Kim Beeman (personal communication, August 15, 1997). As the @SPAM system has no automatic F1 filter, the experimenter was extremely careful in identifying F1 jumps. Before actual data analysis began, the experimenter and @SPAM designer examined several wave forms independently and perfect agreement on the occurrence of F1 jumps was achieved. It is important to note, however, that the interpretation of spectrograms includes some room for error.
Figure 3
Data analysis included independent t-tests and comparisons of effect size for the dependent variables which compared mean differences between the vocal behaviour of withdrawn and control or average children. Mean difference comparisons and correlations of the children’s scores on the trait form of the State-Trait Anxiety questionnaire (Spielberger, Edwards, Lushene, Montouri, & Platzek, 1970: Appendix B) and the Social Support questionnaire (Dubow & Ullman, 1989, see Appendix C) and the dependent variables were also performed.
Overview of the Analyses

In terms of independent variable comparisons, sociometric designation will be the independent measure (two levels: control and withdrawn children). Analysis of possible gender differences was not warranted given the small number of boys in each group (boys’ \( n = 2 \) in both groups). The same problem exists for grade comparisons as the cell numbers for each grade are small, making statistical analysis problematic (see Table 2 for distributions of subjects per grade as a function of sociometric nomination). The schools involved with the study were compared on each of the dependent measures, yet no inference from the results will be performed as showing school differences was not the intent of the present research. Some subjects did not fill out the questionnaires due to an inability to understand the question content or an unwillingness to offer the requested information.

Mean differences of the dependent measures were examined via independent sample t-tests and measures of effect size. Effect size (\( d \); standardized difference between means, Cohen, 1992) analysis was used to unearth statistically nonsignificant mean differences possibly due to the small sample sizes in the present study (Zumbo & Hubley, in press). As suggested in the aforementioned article, effect sizes will be reported for both significant and nonsignificant findings. Kirk (1996) argues that it is imperative that we supplement null hypothesis significance testing with measures such as Cohen’s effect size (1992). Kirk (1996) also offers conversion formulas used to calculate measures of effect magnitude in independent sample t-tests (see Table 3 for
Table 2

Grade Distribution and Mean Grade for Withdrawn and Control Children

<table>
<thead>
<tr>
<th>Grade</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (n)</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>0</td>
<td>4.4</td>
</tr>
<tr>
<td>Withdrawn (n)</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>4.3</td>
</tr>
<tr>
<td>d</td>
<td>$\rho_{pb}$</td>
<td>magnitude of effect</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----</td>
<td>-------------</td>
<td>---------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.2</td>
<td>.10</td>
<td>small</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.5</td>
<td>.24</td>
<td>medium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.8</td>
<td>.37</td>
<td>large</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
population point biserial correlation coefficients ($\rho_{pb}$) and their effect size ($d$) equivalents). See Table 4 for sample sizes and group means and Table 5 for mean group differences between withdrawn and target control children.

An often used dependent measure in speech analysis is total time “holding the floor” or time spent talking (Coplan et al., 1994). In the present study, this measure was not considered as the utility of the vocal data was dependent on interruptions by both the experimenter (prompts) and the other quad members. In other words, only what the target children said in the context of a public speech was used. Any interruptions or responses by the target child that were not in the context of his or her speech (e.g., answering questions from the audience) were excluded, thus making total time holding the floor an irrelevant measure.

In terms of how much of the children’s speech episodes was actual speech (including filled pausing), withdrawn children exhibited significantly less speech than did the target control children (see Table 4 and 5). The magnitude of the effect was large ($\rho_{pb} = .43, d > .8$) (Kirk, 1996). Cohen (1992) asserts that behaviourally, a medium effect would be evident to a careful observer. Thus, in terms of the present research, given that the observed effect size was large, an observer would be able to listen to the signals and actually hear the difference in the amount of speech between the two groups. The variation in $f0$ ($f0V$) between the withdrawn and control children was not significantly different and the trivial effect size ($\rho_{pb} = .04, d < .10$) strongly supports this null result.

Withdrawn and control children showed no significant difference in mean pause duration (see Tables 4 and 5). However, there was a medium effect size ($\rho_{pb} = .25, d >$
### Table 4

**Group Means for Dependent Measures**

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Speech to Total Ratio</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>15</td>
<td>0.528</td>
<td>0.15</td>
</tr>
<tr>
<td>Withdrawn</td>
<td>15</td>
<td>0.397</td>
<td>0.13</td>
</tr>
<tr>
<td><strong>F0V (Hz)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>15</td>
<td>31.46</td>
<td>9.3</td>
</tr>
<tr>
<td>Withdrawn</td>
<td>15</td>
<td>30.88</td>
<td>7.1</td>
</tr>
<tr>
<td><strong>Mean Pause Duration (sec)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>15</td>
<td>1.08</td>
<td>0.77</td>
</tr>
<tr>
<td>Withdrawn</td>
<td>15</td>
<td>1.92</td>
<td>2.28</td>
</tr>
<tr>
<td><strong>Filled Pauses/Speech Total Ratio</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>15</td>
<td>19.9</td>
<td>21.9</td>
</tr>
<tr>
<td>Withdrawn</td>
<td>15</td>
<td>17.7</td>
<td>16.5</td>
</tr>
<tr>
<td><strong>Social Support</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>12</td>
<td>99.7</td>
<td>8.1</td>
</tr>
<tr>
<td>Withdrawn</td>
<td>13</td>
<td>91.8</td>
<td>12.6</td>
</tr>
<tr>
<td><strong>Trait Anxiety</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>12</td>
<td>32.6</td>
<td>4.5</td>
</tr>
<tr>
<td>Withdrawn</td>
<td>11</td>
<td>33.9</td>
<td>5.3</td>
</tr>
</tbody>
</table>
Table 5

Independent t-tests for Dependent Measures

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>t</th>
<th>$p_{pb}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speech to 28 *</td>
<td>28</td>
<td>2.55</td>
<td>.43</td>
</tr>
<tr>
<td>Total Ratio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F0V</td>
<td>28</td>
<td>.19</td>
<td>.04</td>
</tr>
<tr>
<td>Mean Pause Dur</td>
<td>28</td>
<td>1.36</td>
<td>.25</td>
</tr>
<tr>
<td>Filled Pauses/28</td>
<td>28</td>
<td>.75</td>
<td>.14</td>
</tr>
<tr>
<td>Speech :Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Support</td>
<td>23</td>
<td>1.84</td>
<td>.36</td>
</tr>
<tr>
<td>Trait Anxiety</td>
<td>23</td>
<td>.65</td>
<td>.14</td>
</tr>
</tbody>
</table>

Note. *$p < .05$
.5) observed. As the two groups of children differed by almost one full second (.84) in their average pause duration, this result deserves consideration. The nonsignificant result might be due to the small sample size.

Filled pauses were analyzed as a ratio of the number of filled pauses over the speech to total time ratio. The reasoning behind this was that the use of number of pauses as a dependent measure, given the participants' range of total signal lengths (from 36 to 188 seconds), would be faulty in that the number of filled pauses is dependent on the length of the episode. In other words, longer episodes would likely have more filled pauses than would shorter episodes. Considering filled pauses as a function of the average amount of speech creates a meaningful measure -- a rate of filled pausing as compared to actual speech amount. See Tables 4 and 5 for means and group mean comparisons. Counter to the hypothesis, average children exhibited a higher rate of filled pausing than the withdrawn children. The difference was nonsignificant, yet the effect size ($\rho_{pt} = .14, .2 < d < .5$) suggests a group difference in the production of filled pauses.

Withdrawn children's self-reported trait anxiety on the State-Trait Anxiety Scale (Spielberger, Edwards, Luschene, Montaori, & Platzek, 1970) was not significantly different from that of control children (see Tables 4 and 5). The t-statistic and p value indicate a nonsignificant finding, while the magnitude of the effect ($\rho_{pb} = .14, .2 < d < .5$) falls between a small and medium effect size difference and thus is worthy of consideration. The control and withdrawn children also differed in their perceived Social Support (Dubow & Ullman, 1989) scores (see Tables 4 and 5 for group means and mean differences). The p statistic ($p = .08$) indicates a trend in the expected direction,
yet the magnitude of the effect size ($\rho_{pb} = .36$) is just short of what Kirk (1996) considers a large effect size ($\rho_{pb} = .37, d = .8$). This finding suggests a tendency for control children to perceive higher levels of social support than withdrawn children.

The correlational analyses yielded no meaningful relations of the self report measures and the dependent variables other than a significant positive relationship between withdrawn children's trait anxiety scores and their f0V ($r = .61, p = .05$).
Chapter IV

Discussion

The purpose of the present study was to examine paralinguistic differences between children nominated by their peers as withdrawn and average within a public speech episode. It was predicted that withdrawn children would exhibit less overall speech, longer pauses, less variation in their vocal pitch, and more filled pauses within the speech episode than would average children. It was further hypothesized that the withdrawn children would report lower social support and higher trait anxiety than would average children. The self report measures were also expected to be related to the speech parameters. Implications of the results of the present study and comparisons between these results and those of previous research will be discussed.

Summary of Results and Comparison to Previous Research

The hypothesis regarding the difference in the amount of speech produced by withdrawn and control children was supported. Specifically, withdrawn children exhibited less overall speech than did the control children. This result is not surprising as vocal reticence would presumably be one of the criteria peers would use in deciding whether a class mate was socially withdrawn. Referring to the relevant questions posed on the Revised Class Play (Masten, Morison, & Pellegrini, 1985), although vocal reticence was not specifically queried (“Who is very shy” and “Who would rather play alone than with others”), it may be assumed that a reluctance to speak in social situations would be inherent in the perception of shyness in others. Therefore, this result offers support for the validity of sociometric techniques to delineate passively withdrawn children from non-withdrawn children within a school-aged group.
This result is also consistent with the results of other research on the paralinguistic styles of introverted people (Ramsay, 1966, 1968), parent-nominated withdrawn children (Asendorpf & Meier, 1993; Coplan et al., 1994), and reticent speakers (Phillips, 1968; Van Kleek & Street, 1982). Research on the effects of public speaking (e.g., Reynolds & Paivio, 1968) are also consistent with the observed difference in the present study. Except for the Coplan et al. (1994) research, different experimental methodologies were used in each of the above mentioned studies, supporting the assertion that vocal reticence is a characteristic of a passive or withdrawn social style, regardless of whether it is designated by parent or peer ratings of social behaviour.

When considering the speech production difference between peer nominated withdrawn and average children, this outcome may be more usefully viewed as a qualitative rather than merely a quantitative difference in speech production. In terms of contemporary paralinguistic research, the observed difference in speech production can be considered a difference in vocal fluency, not merely a difference in the amount of speech produced. A speech episode that has more actual speech production sounds more fluent to the listener, thus it sounds more “attractive” or favourable (Siegman & Reynolds, 1982). Therefore it is possible that withdrawn children may be perceived less favourably by their peers than nonwithdrawn children partly on the basis of their lack of speech production. However, this conclusion must be qualified on the basis of qualitative speech differences in these data, such as pause length, the rate of filled pauses, and variation in f0. While not statistically significant, the data suggested that withdrawn children tended to produce longer pauses than control children. This is
consistent with Siegman's (1987) claim that withdrawn children produce “unattractive” speech.

The hypothesis regarding the use of filled pauses was not supported. That is, withdrawn children did not use more filled pauses within the speech episode than did control children. This null result may be explained in relation to Siegman's (1987) inverted-U relationship between anxiety and speech rate. The experimental situation in the present study may not have elicited the elevated level of anxiety necessary to observe the effects of stress on f0 variability. Mahl's (1956) finding that patients involved in a highly provocative and personal interview (presumably anxiety provoking) produced more filled pauses than did patients in a less provocative and personal interview (less anxiety provoking) may support the notion that the public speech was simply not stressful or perhaps personal enough to find support for the hypothesized effect. Similarly, the two groups did not differ in terms of f0 variation of their vocalizations. That result is contrary to past research that found introverts to speak more monotonically than extroverts (Addington, 1968; Scherer, 1979). The significant correlation between withdrawn children’s f0 variation and their trait anxiety scores, when considered with the nonsignificant relationships observed between the questionnaire data and the dependent variables is most likely not of interest.

In summary, withdrawn children talked less and tended to produce longer pauses than control children and withdrawn children tended to report higher trait anxiety and lower social support than control children, although these findings were not statistically significant. Therefore, the withdrawn children are not producing what Siegman (1987) considers an “attractive” vocal style with a relatively fast speech rate and short between-
and within-utterance pausing. Their speech is marked by long pauses both between- 
and within-utterances, a style which may lead to negative perceptions from listeners 
(Siegman, 1987). Despite the nonsignificant correlations between self reported trait 
anxiety (except between withdrawn children’s f0V and trait anxiety) and the length of 
pauses, which may be due to low statistical power due to a small sample size, 
withdrawn children’s higher trait anxiety may be associated with these longer average 
pauses. Helfrich and Dahme (1974) suggest that speakers with high trait anxiety 
actively seek support from their audience as they perform a speech which necessitates 
the longer pause durations. If we consider the Helfrich and Dahme (1974) explanation 
of trait anxious speakers’ longer pause duration in concert with Reynolds and Paivio’s 
(1968) finding that speakers who reported high audience sensitivity produced less 
overall speech than people who reported low audience sensitivity, it is possible that 
withdrawn children may be using the lengthy pauses to gauge how their speech is being 
received by their audience. That is, withdrawn children may be using long pauses in an 
attempt to elicit listener responses. More concretely, it is also possible that withdrawn 
children have lower language skills than average children and this social skill deficit 
results in reduced vocal fluency and negative judgements from peers.

Furthermore, given that withdrawn children likely have social skills deficits, they 
may be poor assessors of the verbal or nonverbal cues exhibited by their audience 
which would cause more hesitation and disrupted speech. For example, a withdrawn 
child may observe an audience member’s smile and be less able than an average child 
to decide if what they had just said was actually humourous, or if he or she was being 
laughed at, which may serve to further disrupt their speech. As withdrawn children tend
to be either neglected or rejected by the peer group based on their social behaviour, the withdrawn child may not be misreading the social cues exhibited by their classmates during a public speech episode—it is quite possible that the audience may be providing negative feedback during the speech, further exacerbating the disrupted speech production. As the possibility exists that the anxious speaker is experiencing a combination of extensive cognitive planning (Siegman, 1978), appealing to a possible hostile audience for feedback (Helfrich & Dahme, 1974), and enduring increased cardiovascular arousal during the speech episode (Kagan, 1989), it is no surprise that they have trouble producing fluent speech.

If, in fact the withdrawn children are producing speech that is characteristic of high trait anxiety speakers, this maladaptive communicative style may negatively affect their level of social support. As Siegman (1987) suggests, listeners judge speakers who exhibit lengthy pauses less favourably than speakers who speak more “efficiently” by incorporating short within- and between-utterance pauses in their speech. Although nonfluent speech cannot account for all factors contributing to the withdrawn children’s lower perceived social support, it is reasonable to assume that peers and significant others (e.g., parents, teachers etc.) include vocal cues such as excessive silence and lengthy pauses when they judge who they wish to form friendships with or offer emotional support.

Social Intervention and Training

Although the present research does not directly address the issue of treatment programs for behaviourally withdrawn children, these children may benefit from both early detection and subsequent social skills training. Parents and teachers should be
aware that children who behave in a noticeably inhibited or withdrawn manner may be at risk for future internalizing disorders (Boivin, Hymel, & Bukowski, 1995; Rubin, 1985). Kagan, Reznick, and Snidman (1988) allege that socially inhibited children are also at increased risk of developing gastric ulcers and possible cardiovascular difficulties later in their lives than do non-withdrawn children; further underscoring the need for early detection of the maladaptive behaviour. The present research points to the possible effect of higher trait anxiety on communicative behaviours; therefore an effective intervention may include teaching the children to better manage their anxiety. A program that includes information about the nature of anxiety (why it happens, how it feels etc.) coupled with a progressive muscle relaxation program may be useful in helping withdrawn children to deal with anxiety. In addition, some social skills and self-esteem training may assist withdrawn children in learning one-on-one communicative strategies and public speaking techniques. The public speaking training would familiarize them with how they may feel when speaking before an audience (e.g., bodily sensations, handling questions etc.), which may have a positive effect on the withdrawn children’s social support as they would feel more comfortable in making friends and sharing feelings with others if they could communicate more effectively. Self-esteem training may teach withdrawn children to rely less on their audience or peers for signs of approval, thus reducing their dependence on others for cues regarding their social behaviour.

Limitations of the Study

The present study would have greatly benefited from a larger sample size. For analyses such as those performed in the present study, Cohen (1992) advises that at
least 64 subjects in each group are needed to assure sufficient statistical power. As the present research included only 30 subjects from two elementary schools with only 15 subjects per group, an additional eight or nine schools would have to be included to ensure adequate statistical power. As the Prince George school system has been relatively untouched by University-level research, the lack of parental permission for children to take part in the study also may have had a detrimental effect. Hopefully, the BCHRF project will pave the way for future studies in local elementary schools and perhaps shed some of the parental wariness to allow children to take part in such research projects.

Sociometries may not offer the most effective methodology to group different children for comparison of vocal cues such as f0 variability and filled pausing. Peer assessments of behavioural characteristics may be too open to ambiguity in comparison to more direct physiological measures. Short of grouping children via physiological reactivity, Rubin, LeMare, and Lollis (1990) contend that behavioural assessments of children in several social contexts by trained observers offers the richest account of different behavioural styles. It may be that the sociometric definition of passive withdrawal is too broad to specify exactly what factors are associated with vocal disruption. However, the present research does indicate that elevated trait anxiety may play an important role in explaining withdrawn children’s disrupted speech style.

In terms of specific methodology, the data would have been more extensive if the children were taking up the entire three minutes of the speech episode without interruptions by either the experimenter or the audience. Peer interruptions would
admittedly be more difficult to control given the spontaneous tendencies of school-aged children, yet if they were given more explicit instructions to save questions for later to avoid the interruptions and discussions with the target speaker, the signals would be both more extensive and more easily analysed.

**Future Research in Paralinguistics and Peer Relations**

Kagan, Reznick, and Snidman (1986) consider physiological reactivity a more stable measure of inhibition or withdrawal than behavioural indicators or self-report measures of trait or situational anxiety. In terms of the present study, both cardiovascular reactivity and salivary cortisol level data were collected. Research has shown that inhibited children exhibit greater general limbic arousal in social situations (Kagan, 1989), so, to isolate the effects of elevated anxiety on speech production, indices of different levels of cardiovascular reactivity (withdrawn children would be expected to be more reactive than non-withdrawn children) or different levels of cortisol level assays (withdrawn children would be expected to exhibit elevated cortisol levels when faced with a social task such as a public speech) could be used as levels of the independent or grouping variables.

Some of the assumptions concerning how peers assess paralinguistic cues would have been bolstered by having the children listen to the recordings and simply decide whether they found the samples favourable or unfavourable. To protect participant confidentiality and to test the actual robustness of nonverbal vocal cues, the actual voices could be obscured (i.e., the actual words would be indiscernible, thus maintaining the speaker's anonymity) or the student “judges” could come from different schools. Given that the data for the present research came from a pre-existing study,
this task was not performed but is an option for future research. In addition, as the children were video taped for the project, it may be possible to isolate the children’s behaviour during the lengthy pauses to observe whether they are actively scanning their audience for reaction to their speech. The target child’s pausing behaviour could be examined for any “scanning behaviour” during a long pause. As suggested by the relevant literature (Helfrich & Dahme, 1974), it may be that withdrawn children refer to their audience for approval more than other children.

**Contributions to Social Developmental Paralinguistic Research**

The present study was the first to consider paralinguistic cues (i.e., filled pausing rate and f0 variability) in the area of sociometric peer relations and was one of the first to use computerized techniques (digital signal processing) for the analysis of speech parameters associated with school-aged children’s behavioural styles. It is hoped that the results of the present study will add to the relative paucity of research concerned with nonverbal communicative behaviour of children who display maladaptive or unattractive behaviour within the peer group.
REFERENCES


MY CLASS

For each question below, write names from the list of your classmates.

1. Who do you like to spend time with the most?
   a
   b
   c

2. Who is very shy?
   a
   b
   c

3. Who gets into a lot of fights?
   a
   b
   c

4. Who is cooperative?
   a
   b
   c

5. Who would rather play alone than with others?
   a
   b
   c

6. Who loses his or her temper easily?
   a
   b
   c

7. Who do you like to spend time with the least?
   a
   b
   c

8. Who is a good leader?
   a
   b
   c
HOW-I-FEEL QUESTIONNAIRE

STAIC Form C-2

Name: __________________ Age: ______ Date: ______

DIRECTIONS: A number of statements which boys and girls use to describe themselves are given below. Read each statement carefully and decide if it is hardly-ever, or sometimes, or often true for you. Then for each statement, put an X in the box in front of the word that seems to describe you best. There are no right or wrong answers. Don’t spend too much time on any one statement. Remember, choose the word which seems to describe how you usually feel.

1. I worry about making mistakes ............... ○ hardly-ever ○ sometimes ○ often
2. I feel like crying ................................................ ○ hardly-ever ○ sometimes ○ often
3. I feel unhappy ........................................................ ○ hardly-ever ○ sometimes ○ often
4. I have trouble making up my mind ...................... ○ hardly-ever ○ sometimes ○ often
5. It is difficult for me to face my problems ............. ○ hardly-ever ○ sometimes ○ often
6. I worry too much ................................................... ○ hardly-ever ○ sometimes ○ often
7. I get upset at home ............................................ ○ hardly-ever ○ sometimes ○ often
8. I am shy ................................................................. ○ hardly-ever ○ sometimes ○ often
9. I feel troubled .......................................................... ○ hardly-ever ○ sometimes ○ often
10. Unimportant thoughts run through my mind and bother me .................. ○ hardly-ever ○ sometimes ○ often
11. I worry about school ........................................... ○ hardly-ever ○ sometimes ○ often
12. I have trouble deciding what to do ....................... ○ hardly-ever ○ sometimes ○ often
13. I notice my heart beats fast .................................. ○ hardly-ever ○ sometimes ○ often
14. I am secretly afraid .............................................. ○ hardly-ever ○ sometimes ○ often
15. I worry about my parents ...................................... ○ hardly-ever ○ sometimes ○ often
16. My hands get sweaty ............................................. ○ hardly-ever ○ sometimes ○ often
17. I worry about things that may happen .................. ○ hardly-ever ○ sometimes ○ often
18. It is hard for me to fall asleep at night .................. ○ hardly-ever ○ sometimes ○ often
19. I get a funny feeling in my stomach ..................... ○ hardly-ever ○ sometimes ○ often
20. I worry about what others think of me .................. ○ hardly-ever ○ sometimes ○ often

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SOCIAL SUPPORT

Below is a list of statements about your relationships with family, friends, teachers and other people. For each statement, show how much you agree or disagree by writing an X in ONE box.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My friends look up to me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I am not as popular as other people my age.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. My family cares for me very much.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I am not important to other people.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5. My teacher is usually happy with the work I do.</td>
<td></td>
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<tr>
<td>6. People like me.</td>
<td></td>
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<tr>
<td>7. I can count on my friends.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>8. People my age often pick on me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. My family is really proud of me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. People look up to me.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>11. My teacher does not understand me.</td>
<td></td>
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</tr>
<tr>
<td>12. My family loves me lots.</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>13. My friends don't care about how I am doing.</td>
<td></td>
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<tr>
<td>14. My family depends on me.</td>
<td></td>
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</tr>
<tr>
<td>15. I feel close to my teacher.</td>
<td></td>
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<tr>
<td>16. I can't depend on my family for support.</td>
<td></td>
<td></td>
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<tr>
<td>17. I feel really close to my friends.</td>
<td></td>
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</tr>
<tr>
<td>Statement</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>----------------</td>
<td>-------</td>
<td>----------</td>
<td>-------------------</td>
</tr>
<tr>
<td>18. No one pays much attention to me at home.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>19. My teacher does not care about me.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>20. My friends look out for me.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>21. I feel accepted by other people.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>22. My family really looks up to me.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>23. My friends and I are really important to each other.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>24. I feel like I belong.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>25. My teacher makes me feel important.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>26. If I moved tomorrow, very few people would miss me.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>27. I don’t feel close to my family.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>28. My friends and I have done a lot for each other.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>29. I wish I were a different kind of person because then I’d have more friends.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>