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CONTENTS

THE RELATIONSHIP BETWEEN BEHAVIORAL AROUSAL AND PERCEPTUAL DECISION MAKING IN YOUNG CHILDREN

Albert B. Miller and Ann C. Brobeck

The present study brings together a number of different concepts which bear on an understanding of hyperactivity and associated problems in children. Although the concept of hyperactivity has been the subject of extensive investigation, a clear concept of precisely what is involved in this phenomenon, its effects on learning, and the criteria for diagnosis have not been clearly delineated. Hyperactivity or the hyperkinetic syndrome, is generally defined in terms of the amount of gross motor activity or the appropriateness of such activity combined with problems of short attention span, low frustration tolerance, and impulsive behavior (Werry & Sprague, 1970 and Rosenthal & Allen, 1978).

Much of the literature on hyperactivity and activity level in children reflects difficulties in definition and has failed to distinguish between physiological and behavioral arousal. Rosenthal and Allen (1978), in their discussion of these concepts, suggest that the term "arousal" be used to refer to physiological arousal and the term "activity" be used to refer to behavioral arousal. In light of these distinctions, the present study uses the term behavioral arousal to refer to activity level.

A number of elements typically discussed in the context of problems of hyperactivity and learning disabilities involve behavioral disturbances in the areas of attention, perception, and conceptual tempo. Koppell (1979) has discussed a number of the problems associated with the attentional deficit notions of learning disabilities while Vellutino et al (1977) have discussed a number of the problems associated with the perceptual deficit hypothesis in learning disabilities.

The concept of conceptual tempo or impulsivity-reflection in learning disabilities has been discussed by a number of investigators (see Epstein, Hallahan & Kauffman, 1975), however, the concept has been criticized by Becker et al (1978) in terms of the way in which it is measured. Each one of the above concepts has been characterized by a number of problems when attempts are made to apply them either to the diagnosis of learning disabilities or to utilize them for educational programming in special education.

The present study involves a task which incorporates a number of components related to cognitive difficulties frequently reported as characteristic of the hyperkinetic, learning disabled (LD), and minimally brain damaged (MBD) children. These components are: (1) memory; (2) decision making; (3) cue controlled probability learning; (4) attention, which includes both sustained attention, or vigilance, and selective attention; (5) conceptual tempo or impulsivity-reflection; (6) perceptual accuracy; (7) behavioral arousal, activity level, energy output; and (8) signal detection tasks which, as used here, provide indicators of both sensory sensitivity and response bias characteristics.

All of these components have been widely discussed in the context of children having dysfunctions of information processing. A major weakness of the theorizing, research and treatment practices incorporating these variables has been the inability to separate their effects when examining complex cognitive tasks. In their review of the literature pertaining to attention, arousal, and learning dysfunctions in hyperkinetic children, Rosenthal and Allen (1978) have pointed out many of the problems associated with overlapping definitions and the theoretical consequences associated with failure to separate the effects of significantly different cognitive functions.

The experimental procedures and the signal detection model used for analysis in our study is a particular example of a single subject research design, and reflects a research approach which a number of investigators have suggested be used in the study of learning disabilities, hyperactivity, and associated disorders (Guralnick, 1978 and Baxley & LeBlanc, 1979). In addition to the advantages which derive from the single case design, the signal detection model incorporates a normative property, i.e., the ideal observer, which permits an analysis of the subject's performance with respect to the optimal level of performance as specified mathematically by the ideal observer. In addition, this study conceptualizes the subject's task from an information processing point of view which permits a more directed focus on the specific problematic behaviors of the hyperactive child. Das et al (1978) have discussed the advantages of an information processing approach, and in discussing that particular model, has pointed out that limited work has been done on the decision processing unit.

The present study was concerned with the extent to which the tasks involved in the signal detection procedures used here could serve as an effective model for investigating a number of components generally assumed to operate in the MBD, LD, and hyperkinetic syndromes, using young children (3-5 years old) as a way of obtaining early indicators of possible problems in the areas of attention, memory, perceptual sensitivity, decision making, and activity level or behavioral arousal.

The questions posed in this study were:

1. is the TSD model a sensitive indicator of perceptual processes in children between the ages of 3 and 5 years?

2. does the model permit a distinction between the sensory sensitivity level of the children and their response strategies?

3. will the model distinguish between children of high and low behavioral arousal levels?

METHOD

Subjects. Ten children, eight boys and two girls between the ages of three and five, were drawn from a college-run, pre-school program. Although no formal assessments were done, all subjects were considered to be within the normal range of intelligence and had no identifiable physical or sensory problems.

Apparatus. The stimuli were white rectangles of varying height and constant width drawn from one of two overlapping normal probability distributions. The stimulus distributions were constructed so as to conform to the gaussian equal variance signal detection model described by Green and Swets (1966). The basic gaussian distribution is referred to as the noise (N) distribution. The distribution which results from adding a fixed increment of height to the noise distribution is referred to as the signal plus noise (SN) distribution and the amount of separation is indexed by the measure d' (Tanner and Birdsall, 1958).

The entire N and SN distributions were placed on 35 mm slides and presented to the subject in a random sequence. The subjects were seated in a sound attenuated booth. The stimuli were projected into the booth from the rear onto a rear projection screen. The subject sat at a table at the center of the display approximately five feet away. The observer's response panel consisted of three micro swithces, one each for yes and no responses, and the other for presenting the stimulus. There was also a counter which indicated to the subject the number of correct and incorrect responses made and a light which came on when a correct response was made. A green light on the panel signaled to the subject when a stimulus was available for presentation.

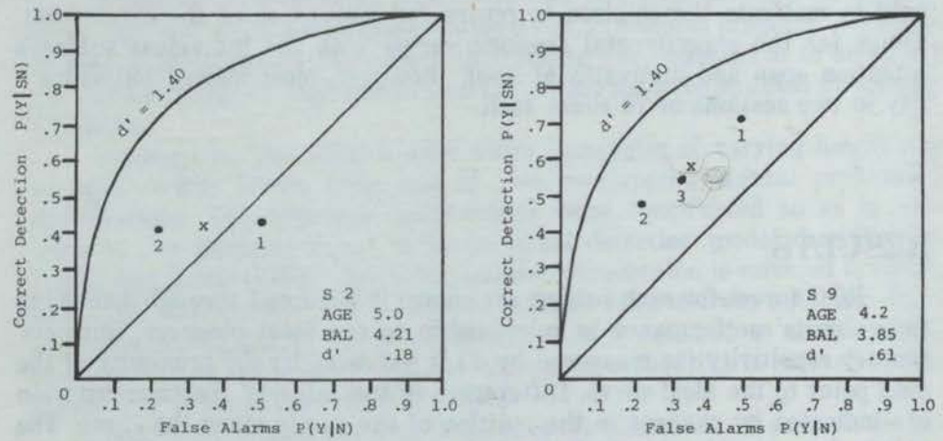
Procedure. The subjects were rated on behavioral arousal level by two observers in the experimental situation. The behavioral arousal ratings involved behavioral elements typically associated with hyperactivity (see, for example, Burks, 1960, Werry et al, 1966, Conners, 1969, Werry & Sprague, 1970, and Davids, 1971) and items which reflected behaviors which were likely to be manifested in the experimental setting.

Initially, the subjects were seated in the booth at the control panel facing the projection screen. It was explained that they would see pictures of rectangles of different sizes and that their task was to decide whether the rectangle was big (SN) or little (N) and then press the appropriate button. They were told that if they were incorrect, a red light would flash; if they were correct, there would be a tone, a blue light would flash, a counter would advance one step, and they would win a token. At the end of the session, they could trade their tokens for toys. Subjects were then given several practice trials with slides from the extremes of the distributions so that correct responses would be assured. They were given their tokens and taken to the prize board where the toys were displayed and told that these

were the toys they could earn during the sessions. No precise differential arrangement of the rewards were arranged since their major purpose was only to motivate the children to return for completion of the experiment. Times for the experimental sessions varied with the individual subject's attention span and motivational level; however, most viewed 140 slides a day in two sessions of 70 slides each.

RESULTS

ROC curves for each subject are shown in Figures 1 through 3 showing the subjects' performance in relationship to the ideal observer. Subjects' sensory sensitivity (as measured by d') is indicated by the proximity of the data point to the ideal curve. Differences in the subjects' response criterion are indicated by changes in the position of the points along the curve. The points show considerable variation in both response criterion and sensitivity over all subjects. Since no attempt was made to manipulate or control the subjects' criterion, these variations are not surprising. Sensitivity also varies widely across subjects, and for subjects at the extremes on BAL measures, shows some large differences. For example, subject 2 with the highest BAL of 4.21, did not complete the 420 observations as did the other children and showed clear difficulty in sitting still and maintaining attention to the task. Subject 2 also displayed a tendency toward perceptual reversals (i.e., responding big when stimulus was little and little when stimulus was big) as shown by point one which is below the chance diagonal. Subject 9 with a BAL of 3.85, which was the second highest ranking on activity level, shows low sensitivity but a much more consistent response pattern. Subject 9's points are indicative of response criterion changes during the three blocks of trials. Both subjects 2 and 9 exhibited extreme behavioral arousal during the task which was in stark contrast to subjects 8 and 1 who had the lowest BAL's of 1.64 and .92 respectively. Both of these subjects showed sensitivity levels at some points close to the ideal observer. The contrast in the attending behaviors between the two highest and two lowest BAL subjects was clearly observable during the experimental task, and is reflected clearly in their ROC curves. BAL's in the middle ranges are not linked as clearly to the position of points on the ROC graph. This relationship appears in Figure 4 which shows the relationship between BAL and performance efficiency as measured by eta (η), the ratio of the subjects' d' to the d' for the ideal observer. The Figure illustrates a general trend associating high BAL's with low efficiency with the extremes showing the clearest differentiation and BAL's in the middle range being less clearly associated with low (η) values.



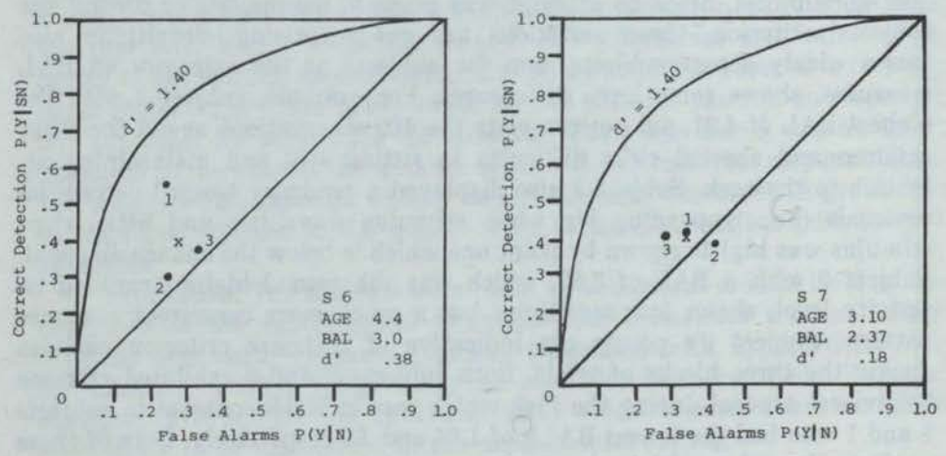
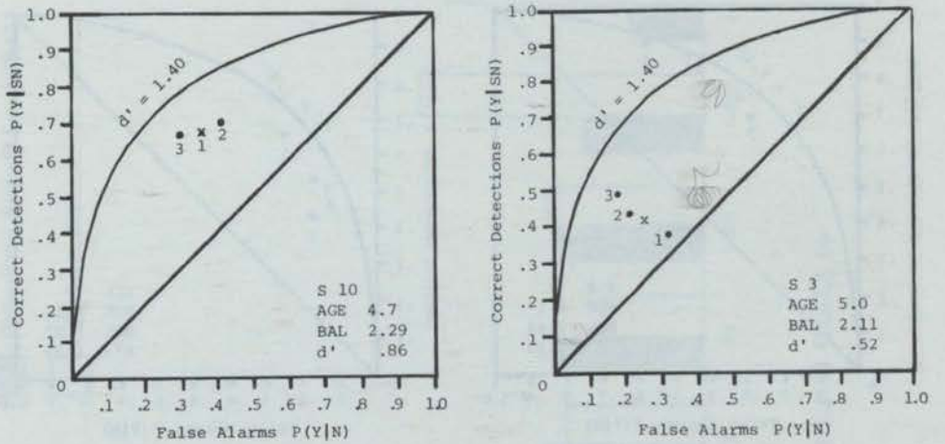


Figure 1. ROC curves for subjects 2, 9, 6, and 7. Each point represents 140 observations with the exception of S2 whose points are based on 62, 83 and 145 observations, respectively. Performance of the ideal observer is reflected by the curve and chance performance by the positive diagonal. Points to the right of the positive diagonal indicate a tendency toward perceptual inversions. Behavioral Arousal Levels (BAL) were rated on a scale of 0 to 5. (Points indicated by x and d' values are based on total number of responses.)



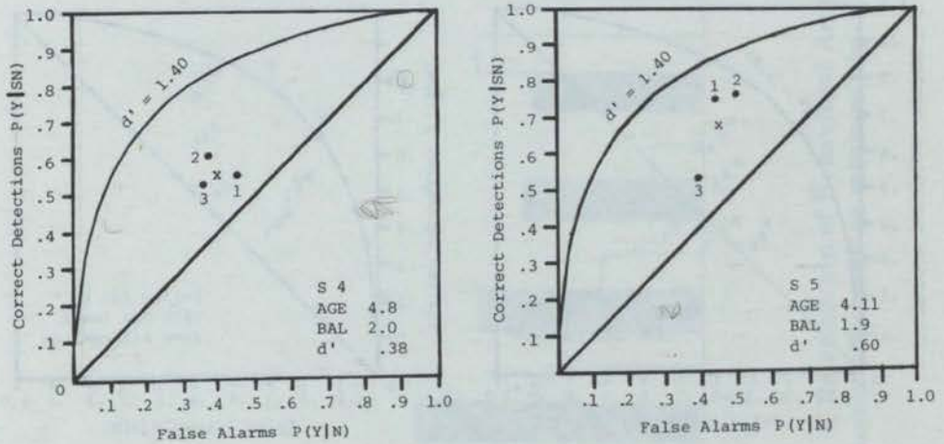


Figure 2. ROC curves for subjects 10, 3, 4, and 5. Each point represents 140 observations. Performance of the ideal observer is reflected by the curve and chance performance by the positive diagonal. Behavioral Arousal Levels (BAL) were rated on a scale of 0 to 5. (Points indicated by x and d' values are based on total number of responses.)

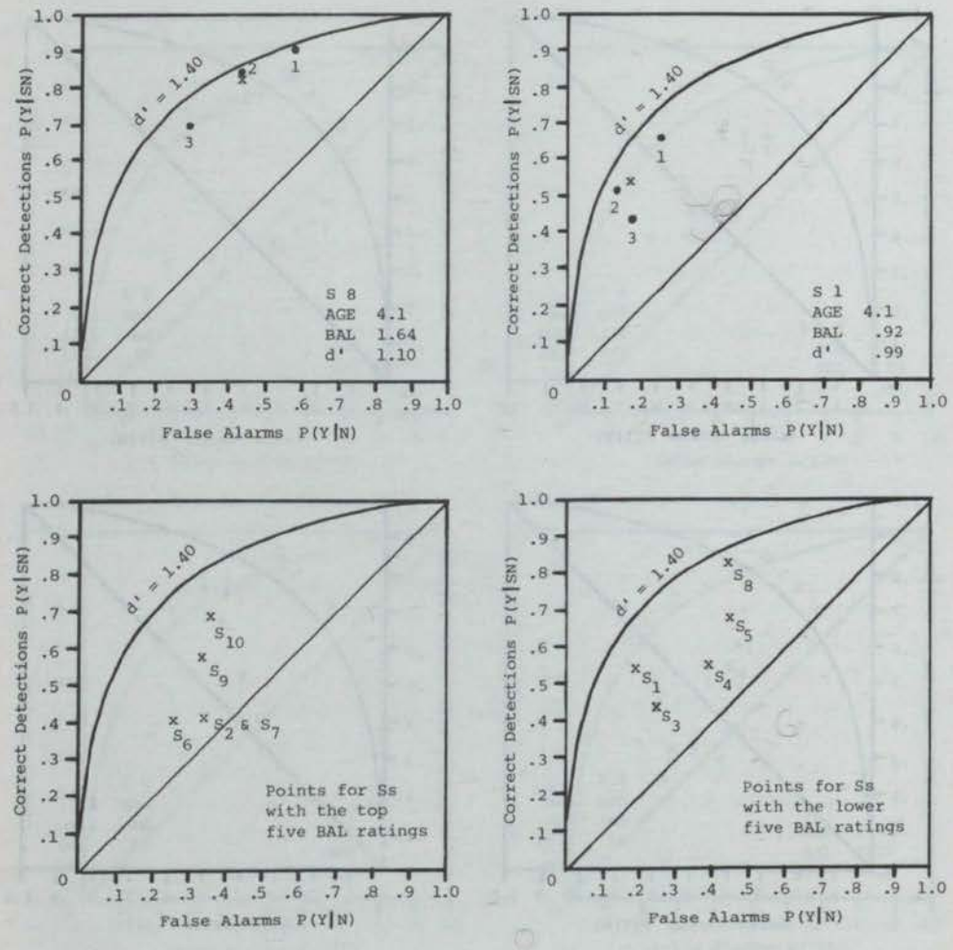


Figure 3. ROC curves for subjects 8 and 1 and for subjects grouped by Behavioral Arousal Level ratings. Points on the graphs for subjects 8 and 1 represent 140 observations. Behavioral Arousal Levels (BAL) were rated on a scale of 0 to 5. Points indicated by x and d' values are based on total number of responses. For both sets of graphs performance of the ideal observer is reflected by the curve and chance performance by the positive diagonal. (Points indicated by x on the graphs for subjects with the top five and lower five BAL ratings represent the total number of responses made by each subject.)

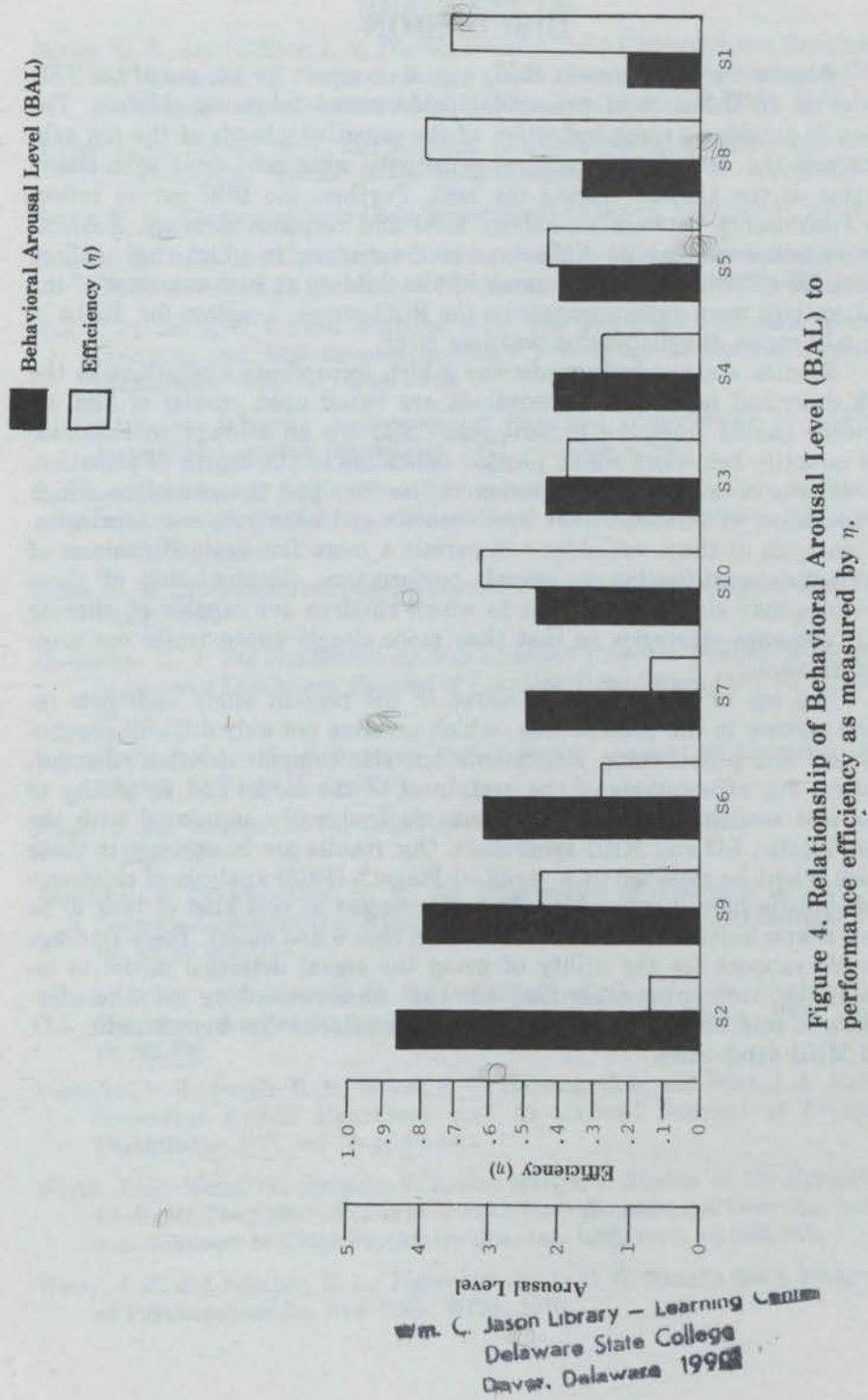


Figure 4. Relationship of Behavioral Arousal Level (BAL) to performance efficiency as measured by η.

DISCUSSION

Results from the present study provide support for the use of the TSD model as an indicator of perceptual performance in young children. The index d' provides a clear indication of the sensitivity levels of the ten subjects and the variations in subject sensitivity were consistent with observations of the subjects during the task. Further, the ROC curves reflect the relationship between sensitivity level and response strategy. Subjects demonstrated substantial differences in the manner in which they utilized a decision criteria. The performance of the children at both extremes of the BAL ratings were quite apparent on the ROC curves, however, for BALs in the mid range, the distinction was less clear.

Studies are presently underway which incorporate alterations in the task described here. These alterations are based upon results of and experience gained from the present study and are an attempt to elaborate and quantify behaviors which provide indicators of the degree of attention, the effects of memory on criterion utilization, and the extent to which arrangement of reinforcement contingencies can alter response strategies. An analysis of these variables will permit a more fine-grained analysis of the factors contributing to overall performance. Manipulation of these variables may clarify the extent to which children are capable of altering their response strategies so that they more closely approximate optimum performance.

The age of the children involved in the present study and their relative success in the present task, which involves not only difficult psychophysical and probabilistic judgements but also complex decision behavior, confirm our expectations of the usefulness of the model and its ability to take into account the behavioral elements frequently associated with the hyperkinetic, LD and MBD syndromes. Our results are in contrast to those which might be expected as a result of Piaget's (1975) analysis of children's probabilistic judgements which suggests success at this kind of task to be more characteristic of much older children (age 6 and older). These findings provide support for the utility of using the signal detection model to investigate concepts essential to the understanding of the disorders of information processing which characterize the hyperkinetic, LD, and MBD syndromes.

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TOXICITY OF FAMILIAR CHEMICALS

Dr. Sadiq H. Wasfi

"All substances are poisonous; there is none which is not a poison. The right dose differentiates a poison and a remedy." Paracelsus (1493-1541)

Toxicology — the science of poisons — is in one sense an old science. Earliest man was aware of the toxic effects of some poisonous plants and animal venoms. The oldest medical record dates back to 1500 B.C. to the ancient Egyptians. There were several recipes of known poisons, e.g. hemlock, which later became the state poison of the Greeks; and opium which was used as both a poison and an antidote. On the other hand, toxicology may be considered a young science because of the over six million compounds in existence today, toxicological information is available only for several thousands. There are no generalizations that can be made on the connections between chemical structure and biological effect.

The resurrection of toxicology came about, at least in part, as a result of the staggering number of cancer cases. In 1977 alone over a million cancer patients were treated. Hundreds of thousands die annually of the disease involving hospitalization costs of $3.5 billion. If one estimates the full economic impact, the cost could run as high as $25-35 billion a year.[1]

In the last ten years people have become aware that poisonous chemicals exist not only in the laboratory, but also in the water they drink, the food they eat, and in the air they breathe. On that basis, a simple knowledge or information concerning the toxicity of some chemical compounds became of interest not only to the chemist or pharmacologist, but to every individual.

Before discussing the different classes of chemical compounds and their toxic effects, let us start with some basic definitions. Toxicity is the intrinsic quality of a chemical to produce an adverse effect. The term includes capacity to induce teratogenic effect. (A teratogen is an agent which acts during pregnancy to produce a physical or functional defect in the developing offspring). The term also includes mutagenic effect which includes all chemicals which are capable of producing a heritable change in genetical material. It also includes carcinogens. Hazard is defined as the probability that injury will result from a chemical under specific conditions.

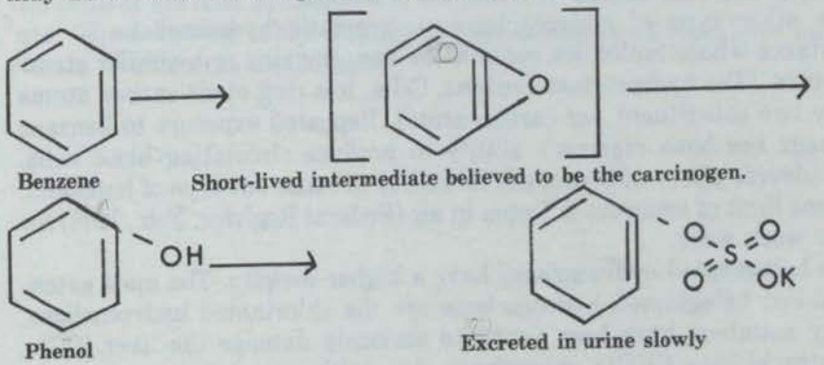
There are several degrees of toxicity which range from simple irritation to death. A toxic effect might include central nervous system depression accompanied by drowsiness and confusion; it may also include damage to a specific organ such as the liver. The extent of eye or skin irritation as well as the extent of sensitization that results in an allergic reaction are additional indices of toxicity. The most commonly[2] measured

toxic response, however, is the death of 50% of the dosed animals within 14 days of a single exposure (LD_{50}). Below are the LD_{50} of some familiar chemicals. One might note that sodium chloride — table salt — is more poisonous than ethyl alcohol, according to the above definition.[3]

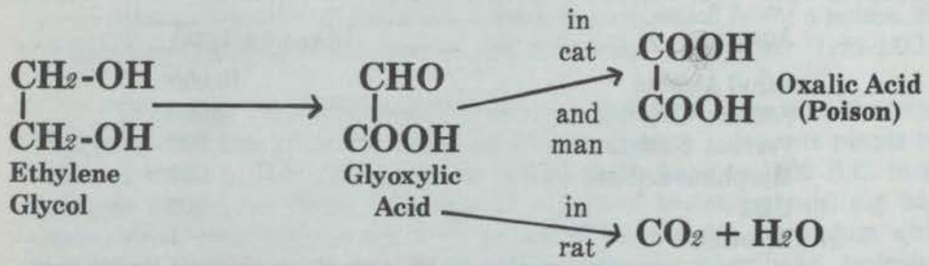
Agent	LD_{50} (mg/kgm)
Ethyl Alcohol	10,000
Sodium Chloride	4,000
Ferrous Sulfate	1,500
Morphine Sulfate	900
DDT	100
Nicotine	1

Toxic responses are normally measured in laboratory animals under carefully controlled conditions or in humans after exposure.

It has been said that the dose makes the poison. Of extreme importance in toxicity is the total dose, usually expressed as the amount of chemical compound administered per unit of body weight of the test species (e.g., mg of compound per kgm of body weight). Of equal importance are the frequency of dosing and the route of dosing, i.e. ingesting, intravenous injection, inhalation, or absorption through the skin. Using care, accidental ingestion could be prevented. However, inhalation exposure occurs with volatile compounds (usually organic solvents) which are readily absorbed into the bloodstream through the lungs. Absorption through the skin can be substantial and is related directly to lipid solubility and inversely to the molecular weight. Metabolism occurs not to detoxify the foreign substance as some people believe, but as an attempt by the body to increase its solubility in water. For example, an organic molecule is oxidized usually to form hydroxy or oxy derivatives. By doing so, the foreign substance might be converted to a more harmful substance. It is believed that this is the case with benzene. After entering the metabolic process benzene may be oxidized to an epoxide intermediate which is the carcinogen.



Extrapolation of the results obtained with experimental animals to humans is difficult because of the great differences in absorption, distribution, metabolism and excretion. For example:



TOXICITY OF ORGANIC COMPOUNDS

The toxicity of some selected substances from the general classes of organic and inorganic compounds will be discussed. Although the examples that will be mentioned are the best studied systems, related chemical compounds may be more or less toxic depending upon metabolism.

HYDROCARBONS: These are substances whose molecules contain only carbon and hydrogen. These molecules are held together by covalent bonds, and in some hydrocarbons, carbon-carbon double or triple bonds exist. Nature's richest sources of these substances are petroleum, coal and natural gas, the three fossil fuels.

Aliphatic hydrocarbons are usually volatile, and if inhaled cause the central nervous depression. This depression is the same phenomenon that leads to anesthetic action in high enough concentrations. At medium concentration it leads to loss of coordination and dizziness. One exception to this general aliphatic hydrocarbon toxicity is hexane, C_6H_{14}, which at high doses in rats and cats causes neurological changes.[4]

The other type of hydrocarbons — aromatic hydrocarbons — are any substance whose molecules contain the benzene ring or a similar structural feature. (The hydrocarbon benzene, C_6H_6, is a ring of six carbon atoms with only one substituent per carbon atom). Repeated exposure to benzene will damage the bone marrow's ability to produce circulating blood cells. Another adverse effect of benzene is its ability to cause one type of leukemia. The present limit of exposure is 1 ppm in air (Federal Register, Feb., 1978) for a 40-hour work week.

The halogenated hydrocarbons have a higher toxicity. The most extensively studied haloginated hydrocarbons are the chlorinated hydrocarbons, and many members have been found to seriously damage the liver (CCl_4, carbon tetrachloride; $CHCl_3$, chloroform: etc.), with some being carcinogenic

(ex. vinyl chloride, trichloroethylene).[5] Other chlorinated alkanes have been studied: 1, 2-dichloroethane; 1, 1, 2-trichloroethane; 1, 1, 2, 2-tetrachloroethane have high liver toxicity.

Alcohols: These are metabolically converted into aldehydes, so ethanol, the most commonly used, is oxidized into acetaldehyde and then to acetate. The most toxic of the alcohols is methanol, which will be oxidized to formaldehyde and then to formate ion. Methanol causes destruction of the optic nerve, resulting in blindness.[6] *Aldehydes* are highly reactive chemicals whose toxicity appears to decrease with increasing molecular weight. The unsaturated aldehydes are more toxic than the saturated.

Esters: These compounds with the general formula, R-C(=O)-OR, are usually hydrolyzed by enzymes in the blood and most tissues to alcohols and acids. A rough guide to the toxicity of esters is the sum of the toxicities of the acid and the alcohols produced by the hydrolysis process.

Ethers: These are compounds with the general formula, R-O-R, where R is an alkyl group. Ethyl ether, for one, causes central nervous system depression and in large doses leads to death. Its action is similar to that of ethyl alcohol, except that with ether the action is rapid and the duration is shorter.

Ketones: None of the ketones have shown any systemic toxicity.

The above mentioned classes of organic compounds are very widely used as solvents to dissolve and mix with oil paints, varnishes, waxes, resins, inks, plastics, rubber cement, or to remove paints. Chemists are not the only group of people who are exposed to these chemicals. Professional artists come into contact with these chemicals more frequently and with greater duration and diverse combination.[7]

Nitrogen-Containing Compounds: All free amines should be considered potentially toxic. Many aromatic amines and nitrobenzenes show the ability to oxidize the iron in hemoglobin to form methemoglobin. This oxidation reduces the ability of the blood to carry oxygen and can result in damage to the central nervous system.[8]

The following tables summarize the toxicities of the above mentioned classes of chemical compounds.

Table I:
Familiar Gases in the Laboratory
Upper Respiratory Irritants[9]

	atm. concns. in ppm		
	perception	tolerance	1-hr. LC_{50}
Acetic acid	10.	100.	5000
Ammonia	20.	400.	5000
Chlorine	3.	100.	300
Formaldehyde	1.	10.	100
Hydrochloric acid	10.	100.	750
Nitrogen dioxide	5.	50.	150
Ozone	0.01	0.5	20
Sulfur dioxide	0.5	25.	600
Hydrogen sulfide	0.3		750
Carbon Disulfide	200.		3000

Table II
Toxic Effects of the Aliphatic Chlorinated Hydrocarbons[9]

Compound		Effect on Liver and Kidneys *
Name	Formula	
Methyl Chloride	CH_3Cl	+
Methylene Chloride	CH_2Cl_2	+
Chloroform	$CHCl_3$	+++
Carbon Tetrachloride	CCl_4	++++
Ethyl Chloride	C_2H_5Cl	
1, 2-Dichloroethane	$(CH_2Cl)_2$	++

*One (+) indicates evidence of damage to liver and kidney in one species of laboratory animal; (++) indicates damage to two species, etc.

Table III:
Comparative Toxicity of Some Familiar Compounds

Name	Formula	Approximate LD_{50} Oral (Rat)	Skin (Rabbit)
Acetic acid	CH_3COOH	3.53 gm/kg	
Propionic acid	CH_3CH_2COOH	4.29 gm/kg	0.50 ml/kg
n-propyl alcohol	$CH_3CH_2CH_2OH$	1.9 mg/kg	5 ml/kg
Allyl alcohol	$CH_2=CHCH_2OH$	0.06 mg/kg	0.05 ml/kg
Propyl acetate	$CH_3COOCH_2CH_2CH_3$	10 mg/kg	20 ml/kg
Allyl acetate	$CH_3COOCH_2CH=CH_2$	0.13 mg/kg	1.1 ml/kg
n-propyl ether	$(CH_3CH_2CH_2)_2$-O	5 mg/kg	20 ml/kg
Allyl ether	$(CH_2=CH-CH_2)$-O	0.3 mg/kg	0.6 ml/kg
Acetone	$CH_3-\overset{O}{\overset{\|}{C}}-CH_3$	9.75 mg/kg	
1, 2-Butanediol	$CH_2(OH)-CH(OH)-CH_2CH_3$	16 mg/kg	
1, 4-Butanediol	$CH_2(OH)-CH_2-CH_2-CH_2(OH)$	2 ml/kg	

Notice the increase in toxicity caused by the presence of C=C carbon-carbon double bond.

TOXICITY OF INORGANIC COMPOUNDS

We have discussed above the toxicity of some organic compounds. Below we will summarize the toxicity of the metallic elements and their compounds.

Table IV:
Periodic Table of Biologically Important Elements

I	II	III	IV	V	VI	VII	
		B	C	N	O	F	H
Na	Mg		Si	P	S	Cl	
K	Ca				Se		
			Sn			I	
IB	IIB			VB	VIB	VIIB	VIII
Cu	Zn			V	Cr	Mn	Fe Co Ni
					Mo		

Table 4 on page 21 represents the essential elements needed to perform the physiological functions. Those that are underlined — the so-called trace elements — have been shown to be essential, or at least beneficial, to man when included in the diet. The estimated daily intake of the essential trace elements, the human body burden, and their presence in the earth's crust are summarized in Table (V).

Vanadium tends to accumulate in the lungs. Workers who are exposed to vanadium pentoxide dust experience a larger number of cases of bronchitis and bronchopneumonia than the average person. Vanadium occurs widely in fuel oil.

The essential role of chromium has been established. The +3 oxidation states play an essential role in certain metabolic processes. The concentration of chromium, like that of vanadium, in the lungs increases with age. Insoluble chromium III compounds can cause lung cancer.

The essential role of iron in the biological system has long been known. The accidental ingestion of a large quantity of ferrous sulfate tablets or other oral iron preparation can result in acute toxicity which is manifested in irritation of the gastrointestinal tract. However, no significant physiological changes are caused by chronic inhalation exposure to iron oxide dust.

Manganese has a much lower body burden level than iron (~20mg per 70 kg weight). The lungs do not accumulate manganese and long term exposure to significant airborne concentrations of manganese are not considered to be a health hazard. However, acute exposures to manganese dioxide dusts in an industrial atmosphere can cause respiratory problems.

Table V:
Estimated Daily Intake and Human Body Burden of the Essential Trace Elements[2]

	Element				
	V*	CR	Mn	Fe	Co
Daily Intake (mg)	2.5	0.06	5	15	0.03
Human Body Burden (mg/70)	30	6	20	4,100	1
Earth's Crust (ppm)	110	200	1000	50,000	23

	Element				
	Nia	Cu	Zn	Se	Mo
Daily Intake (mg)	0.45	3.2	12	0.06-0.15	0.35
Human Body Burden(mg/70kg)	10	100	2300	15	9
Earth's Crust (ppm)	80	45	65	0.09	1

*Probably an essential element.

Cobalt is essential (CoII) as a component of vitamin B_{12}, which is essential for the prevention of anemia. Chronic oral administration of high levels of cobalt compounds can cause goiter.

Nickel is probably essential in mammals, but no biological function has been demonstrated for this metal. No systemic toxicity has been attributed to nickel compounds except that of nickel carbonyl, $Ni(CO)_4$, which is extremely toxic — an exposure to 30 ppm for thirty minutes is lethal.[10]

Copper is required by oxidative enzymes such as catalase and peroxidase. Industrial exposure to copper compounds does not result in acute or chronic poisoning.

Zinc is a constituent of a variety of enzymes, including carbonic anhydrase, carboxy peptidase and alkaline phosphatase. The toxicity of zinc is obscured by the inevitable presence of cadmium in zinc compounds. The zinc-cadmium ratio is of considerable importance in understanding the effect of zinc on living organisms. Acute industrial exposure of freshly formed zinc oxide particulate results in metal-fume fever.

Molybdemun is an essential element. It is a co-factor for xanthine oxidase and aldehyde oxidase. In experimental animals, large doses of Mo IV compound, MoS_2, did not show any injurious effects, whereas Mo VI compounds were more toxic. There are no data on either acute or chronic toxic effects of Mo compounds as a result of industrial exposure despite the wide use of molybdemun in industry.

The biochemical role of selenium is not well understood. Some selenium compounds are extremely hazardous, e.g., hydrogen selenide is extremely toxic. In experimental animals, exposure to 10ppm of H_2Se is fatal.

The Toxic Metals: Among the most toxic elements are beryllium, cadmium, lead and mercury, as well as their compounds. Arsenic is a nonmetal which is widely distributed in the biosphere, especially in air near coal burning power plants, smelters and refineries. A high arsenic concentration in drinking water has been linked to an increase in susceptibility to skin cancer.[11]

Cadmium: In the United States, the average daily intake of cadmium from food is about 50μg (microgram) and ~10μg from water that has passed through galvanized pipes.[6] The prolonged ingestion of high levels of cadmium results in severe renal dysfunction accompanied by increased excretion of protein, glucose, amino acids and phosphorus.

Lead: The average daily intake of lead is 300μg/day, 10% of which will be absorbed. Once absorbed, the lead tends to accumulate in the bones. There are two forms of lead. The first is inorganic and includes all salts and oxides. The second form is alkyl lead, notably tetraethyl lead. The major routes of lead absorption are the gastrointestinal tract and the respiratory system. Absorption is considerably greater in infants and children than in adults.

The absorption of lead by inhalation has been responsible for documented cases of lead poisoning. The fate of a single dose of lead in laboratory animals has been reported. The major characteristics are, 1) rapid transfer to bone, and 2) progressively decreasing rate of excretion. Many organs and systems are adversely affected by lead. There are four major target organs and systems: 1) the central nervous system, 2) the peripheral nerves, 3) the kidney, and 4) the hematopoletic system.

Mercury (Hg): The chemical form of mercury has a substantial influence on its disposition. Elemental mercury Hg°) has a high vapor pressure. A saturated atmosphere at 24°C. contains 18 mg/M^3. of equal importance is the fact that the vapor exists in a monoatomic state. It is, therefore, distributed primarily to the alveolar bed upon inhalation.

Inorganic mercury, Hg^+ (mercurous) and Hg^{2+} (mercuric), has two oxidation states with different levels of reactivity. Hg^{2+} is the more reactive and forms compounds with organic ligands like the sulfhydryl groups which exist in several enzymes. Mercuric chloride is highly soluble in water and highly toxic. On the other hand, mercurous chloride, Hg_2Cl_2, is highly insoluble and so less toxic.

Organic mercury refers to all compounds in which there is a (Hg-C) mercury-carbon bond. Aryl mercury and alkoxyalkyl mercury are converted into mercuric ions in mammalian tissues and their toxicity resembles that of mercuric compounds.[12]

The toxicity of methyl mercury is species dependent.[13] Two incidents of acute methyl mercury poisoning with tragic ramifications have been documented. The first one, in Japan, resulted from the consumption of fish with a high methyl mercury content. The poisoning was characterized by high incidence of "congenitally defective infants." The second incident of mercury poisoning was in Iraq in 1972, caused by eating bread made from wheat pretreated with methyl mercury fungicide.[14] Some of the toxic symptoms were slurred speech, impairment of vision and hearing, and finally, death. A comparative study of the group that was briefly exposed in Iraq and a group in Samoa that was subjected to a long term low level exposure to methyl mercury, indicates that toxicity depends upon age and maximum body burden and not the duration of exposure.[15]

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THE CITIZEN-SOLDIER AND FOREIGN POLICY CRISES: BERLIN AND VIETNAM

Joseph H. Spina

The 1961 Berlin Crisis and the 1965 Vietnam Intervention are the best contemporary examples we have of the use and nonuse of U.S. Reserve Forces during international confrontations. What can we learn from these two cases about the factors likely to compel a reserve call-up? The contention here is that a reserve mobilization will ultimately hinge on whether a president wants clearly and dramatically to manifest resolution to two target groups - (a) the domestic populace and (b) the external adversary - and **that this signalling effect and its likely impact will override any military rationale for the deployment of these forces.** Of all the options in the presidential arsenal, few have the same psychological effect, indeed, shock value, as a call-up of citizens-soldiers with its associated economic, political and social disruptions. By its very nature, this action communicates an unmistakable message - "we are committed; we have raised the ante." In both the Berlin and Vietnam decisions the likely consequences of this signal on the homefront and overseas was the paramount consideration in Kennedy's approval and Johnson's rejection of a reserve mobilization.

THE BERLIN CASE

During the summer of 1961, the United States and the Soviet Union were locked in a showdown over the status of West Berlin. The Russians were demanding that the NATO Powers sign a peace treaty granting East Germany legal recognition and establishing Berlin as a free city with future Allied access contingent upon direct negotiations with the Ulbrecht regime. If the West failed to go along with the proposal, Khruschev threatened to sign a separate peace treaty with East Germany. Allied occupation of Berlin would then be in direct violation of East German sovereignty and "pose a threat to world peace."The Kennedy administration saw Khruschev's demarche as a challenge to American treaty obligations as well as a "test of nerve" and sought a response that would impede Russian efforts to change the status quo. As Arthur Schlesinger recalls, JFK felt that "if Khruschev could be deterred only by fear of direct encounter, the Allies must consider how to convince him that such an encounter would be sufficiently costly."[1] The reaction came on July 25th as Kennedy announced an increase in defense appropriations, military manpower ceilings and monthly draft calls. U.S. troop strength in Europe was to be reinforced by the deployment of two STRAC divisions and a number of mothballed naval vessels were to be activated for use during the crisis. At home millions of dollars were to be funnelled into an expanded civil defense program. Rounding out the President's package of hardline measures was a call for the immediate mobilization of 150,000 Reserve and National Guard personnel.

THE VIETNAM CASE

The Vietnam War began to escalate rapidly during the early months of 1965 as the United States, responding to increased Viet Cong attacks in the South, launched Operation Rolling Thunder - the bombing of military and support facilities in North Vietnam. The air assault was aimed at demonstrating American commitment to the war and implied greater punishment to come if Hanoi did not stop the Viet Cong insurgency. The psychological use of air power to break the will of North Vietnam soon gave way to a more sustained and destructive bombing campaign geared towards crippling the North's war-making capabilities. Before long, however, the Johnson administration realized that Rolling Thunder was having little success in bringing Hanoi to the negotiating table or in curtailing enemy activity in the South. The failure of the bombing to stifle growing VC strength forced a reassessment of U.S. ground strategy. On April 1-2, President Johnson ordered two additional Marine battalions to South Vietnam, an increase in support troops by 18,000 to 20,000 men and, in a major policy reversal, approved the use of U.S. Marines in offensive ground operations within a fifty-mile radius of their base camps. Yet, despite these efforts, the battlefield situation continued to deteriorate. By June, the South Vietnamese Army was suffering a string of military defeats under the onslaught of the VC summer offensive. Faced with probable collapse of the Saigon regime and under pressure from the military for immediate American reinforcements, President Johnson announced at a July 28th press conference what the *Pentagon Papers* study calls the decision "perceived as a threshold entrance into an Asian landwar."[2] Reaffirming U.S. determination to resist communist aggression, Johnson ordered an increase in American military forces from 75,000 to 125,000 men with the stipulation that more troops would be sent later. But unlike Kennedy in the Berlin crisis, LBJ refused to mobilize the Reserves adding, "I have concluded that it is not essential to order Reserve units into service now."[3]

THE BERLIN STRATEGY

Berlin called for a bold response that would simultaneously reaffirm U. S. treaty commitments and convince a skeptical public of the gravity of the crisis. President Kennedy put it bluntly: "That guy (Khruschev) doesn't pay much attention to speeches. He has to see you make a move."[4] A reserve call-up was viewed as a "get tough" measure that would bolster our deterrence posture while rallying public opinion to the administration's side. Such a risky countermeasure would convey to the Russians and Americans alike a demonstration of national resolve since, as presidential aide Theodore Sorensen noted, mobilization in peacetime "had traditionally been considered politically suicidal."[5] The reserve "card" would communicate to Kennedy's dual audience a willingness to pay the price in his test of strength with the Soviets.

Within this context the tactical utility of the reserves was of secondary importance. What really mattered was the **message** this decision conveyed. Senior American officers would later comment that the reserves contributed little to stabilizing the military situation in Europe.[6] In fact, training time and equipment shortages kept most reserve units from being deployed for months, long after the crisis had subsided. But these military shortcomings mask a key point. The advantage of the reserves, in Kennedy's calculus, was not in their battlefield potential but in their role as political instruments in influencing the perceptions and behavior of the Soviet leadership.

THE VIETNAM STRATEGY

Lyndon Johnson elected to fight the Vietnam War with active-duty units and draftees because of what he perceived to be the adverse signalling effect a reserve mobilization would have within the United States and on North Vietnam and her allies.

From Johnson's standpoint a reserve call-up meant escalation, the kind of provocative act that would compel China or even the Soviet Union to intervene openly on the side of the North Vietnamese.[7] If Johnson wanted anything, it was to prevent the Vietnam situation from mushrooming into a ground struggle between American and Chinese troops, the long-dreaded "land war in Asia." The reserves might trigger the "flash point" and this ran counter to Johnson's strategy of graduated response. LBJ was determined to present an image of continuity in his Vietnam policy. To quote Townsend Hoopes, the intervention

> **had to be made to look as though nothing was changing, as though it all flowed inexorably from commitments made by Eisenhower in 1954 and Kennedy in 1961, as though Lyndon Johnson was essentially a victim of history doing no more than his bounded duty. . .To a president convinced he must take new actions, yet obsessed by a need to preserve the posture of continuity, no major and overt actions were possible.**[8]

Thus, the reserves would not be used because, "it would be self-evident that we were really going to war and that we would in fact have to pay a price. Which went against all the administration's planning: this would be a war without a price, a silent, politically invisible war."[9] Whereas Kennedy wanted to dramatize his resistance to the Russians and saw a reserve mobilization as one way of exhibiting his resolve, Johnson sought to downplay the war and the growing American involvement by avoiding the appearance of escalation embodied in a reserve call-up.

Not far removed from the international consequences of a reserve mobilization was the expected adverse reaction at home. Johnson wanted to avoid politicizing the conflict and endangering his Great Society programs.[10] A full-war footing would jolt the public and the Congress, spark opposition and thus weaken his ability to pursue both "guns and butter." Kennedy sought to arouse the public in support of his deterrence strategy while Johnson sought to pacify the public by undermining a war psychosis. JFK saw a reserve call-up as a unifying measure that would strengthen his hand, LBJ saw it as a divisive one that would weaken his.

In one respect, however, the two decisions paralleled each other. As with Kennedy, the tactical utility of the reserves was of secondary importance to the political and diplomatic message a call-up would signal. Perhaps the best indicator of this is that in bypassing the reserves, Johnson overrode the unanimous advice of his Joint Chiefs of Staff whose plans for carrying out an expanded war were premised on a reserve mobilization.[11]

SUMMARY

The use of reserve forces during foreign policy crises will depend less on their military capabilities than on their communicatory role in signalling escalation and resolve. In Berlin and Vietnam what mattered most was the perceived impact of a call-up on the external adversary and the domestic populace. The fact that reserve units were poorly trained and inadequately equipped and probably couldn't get to Europe for months was ancillary to the warning mobilization conveyed about Kennedy's intent to stand firm. Lyndon Johnson was equally as determined not to use the reserves despite their central role in Pentagon planning and the strain nonmobilization would have on the Army's manpower procurement process.

In Johnson's eyes the likelihood of Chinese or Soviet intervention and the political damage to this Great Society program outweighed the military rationale for using citizen-soldiers to fight the war.

On reflection, one wonders after looking at these two cases whether it really matters if the reserves are at a maximum state of readiness given that their capabilities count for so little in the decision to mobilize. Short of an all-out war, the reserves function best as political instruments in crisis management. In such instances the mere act of mobilization and all it symbolizes weighs most heavily in presidential decision-making not whether the reserves are highly ready or only moderately so. After all, the credibility of the reserves in a foreign policy crisis comes primarily from the **political** costs associated with their use, and the willingness to bear this burden says a great deal about presidential intent.

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SOCIAL SKILLS TRAINING FOR CHILDREN AND ADOLESCENTS: SOME ESSENTIAL CONSIDERATIONS OR AN EFFECTIVE PROCEDURE THAT MAY GO WRONG

Warren A. Rhodes

The term "social skills" refers to "the compound abilities necessary for effective interpersonal functioning", while "assertiveness" typically refers to a "subcategory of social skills in which the emphasis is on the ability to express both positive and negative feelings in the interpersonal context without suffering consequent loss of social reinforcement" (Bornstein, Bellack and Hersen, 1977; P. 184). It would not be an overstatement to say that assertiveness training and social skills training procedures have recently received a tremendous amount of attention in the literature (Bornstein, Bellack and Hersen, 1977; Eisler, Miller and Hersen, 1973; Hersen and Eisler, 1976; Rhodes, Redd and Berggren, 1979; Wolpe and Lazarus, 1966; see Hersen and Bellack, 1976; Hersen, Eisler and Miller, 1973; for reviews).

The number of new books, crash programs, workshops, etc., on the topic is staggering. Most of this attention, however, has been directed at adult populations, although some work with children (Bornstein, et.al.) and adolescents (Rhodes, et.al.) has been accomplished. The benefits of social skills training for children are far-reaching, considering the poor prognosis given those lacking in appropriate social skills (Bornstein, et.al.; O'Conner, 1969). Therefore, it is expected that the amount of clinical treatment and research with children and adolescents directed at improving social skills will increase tremendously in the near future. There are, however, possible negative effects (Rhodes, et.al.) of social skills training that must be fully understood before one attempts to use these procedures with certain childhood populations.

Children can be very vicious towards one another, particularly in child care institutions. While working in these institutions, incidents can be observed in which children without provocation, verbally and physically attacked their passive and unassertive peers (the aggressive child may swear, take away personal property, pull the hair and generally badger the passive child) and encountered no resistance whatsoever.

For a professional in a position to intervene in these types of inappropriate social interactions, there are three possible courses of action: one can focus primarily on the aggressing children and attempt to control their inappropriate behaviors; one can focus on the group, dealing with the unassertive child who is the target of aggressive behaviors and the rest of the children simultaneously; or one can focus one's attention on the individual child who is the target of the aggression. There are advantages and disadvantages in pursuing any of these alternatives. This discussion will assume that the latter

course of action has been chosen. That is, the professional will work directly with the unassertive child to improve his social functioning at this point. Perhaps a case, by no means an anomaly, can serve to demonstrate.

Billy is a fourteen-year-old who has been living in a child care institution for six months due to parental neglect. His behavior is consistantly passive, withdrawn and unassertive; his eye contact is poor and his speech generally inaudible. Billy never initiates social contact with his peers and seems fearful when they initiate such interaction with him. In a classroom situation he is an observer, usually sitting in a corner away from the ebb and flow of class activities, and coaching by the teacher has not been effective in helping Billy become more involved. As a result of his isolation, he loses the advantages of participation with peers, e.g., giving and receiving feedback, learning appropriate classroom social skills, etc.

Unfortunately, Billy serves as the class scapegoat. As O'Connor (1969) has pointed out, ". . .children who are unable to relate skillfully to others are likely to experience rejection, harassment, and generally hostile treatment from peers." This is obviously the case with Billy; he is typically the target of unprovoked verbal assault; his class materials are taken from him while he offers no resistance, and he is the target of the majority of his classmate's jokes and trickery. Even those members of the class who behave in a socially appropriate manner toward the rest of their peers can be observed mistreating Billy. Not surprisingly, regardless of the situation in which Billy finds himself, he behaves in the same manner and his peers react accordingly.

The general nature of Billy's behavior seems to warrant some form of social skills training. A thorough assessment of Billy's interpersonal behavior would probably identify him to be a prime candidate for assertive training. Several studies (Bornstein, et.al., 1977; Kagan and Moss, 1962; Patterson, 1964; Rhodes, et.al., 1979; Robinson, Vitale and Nitsche, 1962; Ross, Lacy and Parton, 1965) have used a combination of procedures including instruction, feedback, behavior rehearsal and modeling to increase social skills. A similar social skills training program, targeting assertive skills, may be elected for Billy. Before an assertive training program is actually initiated, two important factors must be taken into account: (1) as Billy's behavior changes as a result of the training, so too, will that of his peers; and (2) positive changes in Billy's behavior will not necessarily lead to positive changes in the behavior of his peers. For example, Billy may be taught in a social skills training program to verbalize his feelings about being mistreated by his classmates and to exhibit behaviors that have been shown to be related to increased assertiveness by other investigators (Bornstein, et.al., 1977; Eisler, et.al., 1973). The behavior of Billy's peers, however, may not change in the desired direction. In an earlier study by this author (Rhodes, et.al.) it was noted that as the behavior of an unassertive adolescent became more socially appropriate, the behavior of his peers became more socially inappropriate, i.e., they became

more aggressive. Hence, success in social skills training may lead to the development of socially appropriate behaviors that are punished by the environment.

Whereas the intent of social skills training is to produce socially appropriate behaviors that will be maintained, it is to be expected that behaviors that are punished by the environment will decrease in frequency (Ferster and Perrott, 1968). It is not possible, in planning a social skills training program for the unassertive child, such as Billy, to assure that newly acquired behaviors will have the intended effects. It is, however, possible to incorporate a continuing evaluation procedure that will allow ongoing assessment of the effects of behavior changes. An effective evaluation component should provide answers to such questions as: Does Billy's behavior indicate he is gaining in social skills?; Have these behaviors generalized to the natural environment?; What positive or negative changes have been produced?; Are there environmental variables that can be manipulated to increase the positive consequences and decrease the negative? Incorporation of an effective evaluation component greatly increases the chances of identifying and averting potential problems in social skills training programs. For example, Billy might be observed exhibiting a newly learned behavior in inappropriate situations and it may be necessary to implement or intensify discrimination training, or the responses of Billy's peers may indicate that he has not been provided with a wide enough range of effective, appropriate alternative behaviors for a particular social setting. The positive effects of a well-conceived and implemented social skills training program are well documented (Hersen and Bellack, 1976; Hersen, Eisler and Miller, 1973). However, in order to maximize potential benefits for the client it is essential that the intervening professional be constantly aware of the impact the training procedure is having on the client's social milieu and of the impact that milieu is having on the client's behavior.

The increased use of social skills training programs for the unassertive individual has been supported by overwhelming positive effects noted in the literature. Possible negative consequences have almost been totally neglected. To avoid unexpected negative consequences of social skills training, one must constantly evaluate the impact this training has on the social milieu. This is particularly true in child care institutions where children generally may exhibit more socially inappropriate behaviors than in the normal childhood populations. These children may manifest behavioral problems by aggressing toward their passive and unassertive peers. They may sabotage a social skills training program by escalating their aggressive behaviors in response to the unassertive child's newly acquired behaviors. An appropriate evaluation component can alert one to these possible negative effects.

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THE MULTIDIMENSIONAL PSYCHE: CHARACTERS FROM VIRGINIA WOOLF'S *THE WAVES*

(Clenora Hudson-Withers)

Virginia Woolf's novel, *The Waves,* is by far one of the most cerebral works of art devoted to the task of explicating the mental psyche or operations of a mind and its reactions to the physical world. The novel affords the reader an exploration through the psyche of an invisible person, laying bare the mental processes of that individual. This artistic masterpiece describes those elements making up the psyche of that individual and outlines his various stages of mental growth and moods through the use of dominant character representation. That is, each character receives superior emphasis or focus at a designated time in the novel reflecting a given emotional stage of life embodied by that particular individual. The various levels of consciousness of each character illustrate how these various forces dominate different stages of life at different stages of development or maturation.

There is strong evidence of a pattern of growth represented by the six characters, Bernard, Susan, Rhoda, Jinny, Neville and Louis, in the novel. A serious perusal of the work reveals that each of the characters represents a stage in its own growth and the nature of that growth is equivalent to the nature of that person at that particular time or stage in life. There are conflicting forces within every individual and these forces at play inside the person is precisely what Virginia Woolf is attempting to articulate.

The forces are all present in the person at the beginning of life; however, each force or characteristic comes to its own fruition in its own time. Evidence of the presence of all forces are present in the opening chapter commenting on the early school years when all six characters reveal their individual selves through relating their impromtu responses to the physical world:

> **"I see a ring," said Bernard, "hanging above me. It quivers and hangs in a loop of light."**
>
> **"I see a slab of pale yellow," said Susan, "spreading away until it meets a purple stripe."**
>
> **"I hear a sound," said Rhoda, "cheep, chirp, cheep, chirp; going up and down."**
>
> **"I see a globe," said Neville, "hanging down in a drop against the enormous flanks of some hill."**
>
> **"I see a crimson tassel," said Jinny, "twisted with gold threads."**
>
> **I hear something stamping," said Louis, "a great beast's foot is chained. It stamps, and stamps, and stamps."**[1]

These remarks give the reader an early insight into the distinct person-

alities of the characters. For example, there is obvious contrasting values presented which are symbolized by Susan's statement reflecting her domesticity and Jinny's statement inferring materialism. In presenting the six contrasting or conflicting personalities in this pitted manner, the author appears to be suggesting the existence and presence of these inclinations and values within a single personality.

It is fairly clear that the novel is a character study of one individual who is identified in the last few pages. The different character representations are nothing more than facets of one individual and thereby becoming the composite of many inner psychological forces working within that psyche. The novel attempts to explicate the culmination of the awareness and understanding of the self as an intrinsic, intricate being, and through the author's faculties and descriptions, we are able to witness the conflicting forces as they interplay.

The Waves offers strong support of Virginia Woolf's theory of the undefinable human character because of both the impermanence of time and each character's dependency upon the other for definition or existence. Since we cannot pinpoint personalities or characteristics, without flexibility depending upon time, place and circumstance, and since personality is caught up in a constant flux of time dictating relativity and change ("There is no stability in this world. Who is to say what meaning there is in anything? Who is to foretell the flight of a word?"—256), it becomes impossible to define a person one day and expect that definition to be invariably applicable later. Joan Bennett in *Virginia Woolf: Her Art as a Novelist* asserts that the artist perceives "the variety of impressions made by one person upon the people round him and his own ever-changing consciousness of the surrounding world."[2] People are the extensions of those viewing them; therefore, they may represent one thing at one time to one person and an entirely different thing to another at another time. Moreover, because the analyzers bring to the character evaluation a part of themselves, their idiosyncracies and ever-changing values and concepts, there is a propensity for them to be likewise mere reflections or extensions of those personalities, hence "the fluidity of human personality rather than its fixity."[3]

Throughout the novel the author uses individual leit motifs or symbols for the characters as a means of demarcating various stages or levels of consciousness. For example,

> **Bernard is tied to his curiosity, his phrase making, his desire to find a story; Susan to her need to strike roots to possess, "to give, to be given." Rhoda to her dreams and her fear of life; Jinny to her sensuousness and need for admiration; Neville to his love of order and intellectual clarity; Louis to his social insecurity, his Australian accent."**[4]

Obstensibly it appears that the author is stressing individuality; however, as R. L. Chambers proposes in *The Novels of Virginia Woolf*, "are they not almost six parts of one person, six apart who know that they cannot be but ought to be at one?"[5] I am of the opinion that not only is the issue that they ought to be at one" but that they are, in fact, one and the same individual, hence giving rise to the concept of oneness.

Of the six characters, it is Bernard who strongly embraces the theory of oneness. The culminating character in its many personalities is defined in Bernard's assertion that "I do not believe in separation. . . .We are not single—we are one" (221). Coming to fruition at the latter stage of life, he emerges as the strongest; he is at the apex of maturity, the soul survival. This theory is culminated in the last section presenting Bernard's intellectualized monologue in which he asserts "I am not one person; I am many people; I do not altogether know who I am–Jinny, Susan, Neville, Rhoda, or Louis: or how to distinguish my life from theirs" (368). Although the Bernard facet of the personality is impulsive ("I have no aim, I have no ambition, I will let myself be carried on by the general impulse" (233), and defiant like the Byronic hero who will "snap fingers in the face of destiny" (234), he is the rational element and devotes his life in search for truth. He strives "to fuse together the different elements and to force a pattern upon chaos."[6]

Susan, the envious and emotional individual who loves and hates with equal intensity, symbolizes the idealistic stage of the mind. Thus, "conforming to the highest ideals of womanhood, she turns her energies to maternity and domesticity."[7] She has committed herself to the traditional role of wife and mother and thus she vows, "I shall have children; I shall have maids in aprons; I shall be like my mother, silent in a blue apron locking up the cupboards" (243). In committing herself to maternity, she has surrendered her individuality and consequently becomes only physically fulfilled as opposed to Bernard who is the embodiment of mental fulfillment towards the end of the novel.

In everybody's life there is a phase of fear and frustration which gives rise to insecurity. Representing this stage in life is the personality of Rhoda, the personification of neurotic instability. Because of her overwhelming fear of life, her inability and refusal to cope with its complexities ("I am afraid of you all. I am afraid of the shock of sensation that leaps upon me, because I cannot deal with it as you do–" p. 265), she commits suicide and thus brings an end to the alienated, doomed and destructive element in the psyche of the overall personality.

Like Rhoda, Louis, too, is insecure, and despite his intellectual superiority, he has an inferiority complex stemming from his low opinion of his ancestry. He therefore concludes, "I cannot boast, for my father is a banker in Brisbane, and I speak with an Australian accent" (195). Unlike the suicidal

Rhoda, however, he succeeds in life as a prosperous, respected businessman, though his pursuit of success denies him inner serenity and joy.

Symbolizing the sensuous aspect of the personality is Jinny who dominates the youthful years when one exuberantly embraces the carpe diem outlook on life. The center of attraction, she puts all her energies in the present with foreknowledge that everything is subject to change. Hence she concludes, "There is nothing staid, nothing settled in this universe" (206).

Somewhat like Jinny in her refusal to surrender her identity despite society's frown upon her promiscuity, Neville is rebellious and pessimistic embracing the concept of the inevitable doom of mankind. He feels that man is forever pitted against "the implacable tree that cannot be passed--'There stands the tree I cannot pass.' "[8] He represents that stage of life when one tries to define and civilize his own humanity and existence..

The final facet of the personality to be discussed is embodied in the character of Percival whom we come to realize only through the consciousness of the other six characters. He represents the element of the personality that controls pure action as opposed to thought. He embodies that force in the psyche that establishes reality since action is real and as Neville asserts, "without Percival, . . . there is no solidity" (p. 259), no matter how dominant or powerful the other forces may be. It is through him and his death that the change from reality to unreality, childhood to maturity, is established. Hence, his death affords Rhoda the necessary motivation for her ultimate action, her suicide: "Percival, by his death, has made me this present, has revealed this terror, has left me to undergo this humiliation" (286).

The novel, therefore, represents a successful effort to describe the forces and roles at work in a particular personality. That is "the six speakers exist simultaneously as representative figures and as part of a communal whole."[9] The seventh figure, Percival, should be included also so that the sum of that invisible complex personality equals to the total of those seven parts embodied by the characters. In short, the author has amalgamated these distinct characters (the rational Bernard, the possessive Susan, the neurotic Rhoda, the sensuous Jinny, the pessimistic Neville, the insecure Louis and, of course, the man of action himself, Percival) in the creation of one multidimensional personality.

FOOTNOTES

[1]Virginia Woolf, *Jacob's Room and The Waves* (New York: Harcourt, Brace and World, Inc., 1959), p. 180. Further quotations from *The Waves* will be taken from this edition, with page numbers supplied in parentheses.

[2]Joan Bennett, *Virginia Woolf: Her Art as a Novelist* (New York: Harcourt, Brace and Company, 1945), p. 38.

[3]*Ibid.*

[4]*Ibid.*

[5]R. L. Chambers, *The Novels of Virginia Woolf* (London: Oliver and Boyd, 1947), p. 6.

[6]Irma Rantavaara, *Virginia Woolf's "The Waves"* (Port Washington: Kennikat Press, 1960), p. 35.

[7]Josephine O'Brien Schaefer, *The Three-Fold Nature of Reality in the Novels of Virginia Woolf* (London: Mouton & Co., 1965), p. 152.

[8]Rantavaara, p. 16.

[9]Susan Gorsky, " 'The Central Shadow': Characterization in *The Waves*," *Modern Fiction Studies*, XVIII (1972), pp. 449-66.

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A HISTORICAL APPROACH TO TEACHING STANDARD ITALIAN TO DIALECT SPEAKERS

Filippo Toscano

One of the major problems in the teaching of standard Italian to the dialect-speakers in America starts with a common misunderstanding. For example, educators have extreme difficulty defining an Italian dialect. Most dialects of the Republic of Italy are languages of their regions, and not a subproduct or deficient effort to communicate. As we all understand, French, Spanish, Italian, Portuguese, and Roumanian, were once all dialects of Latin. Chronologically, all languages were once dialects, stemming from a unique crystallization. Most positively, there is no language that cannot be called, at times, a dialect; and in the studies of comparative philosophy, equal importance is given to the literary language, as well as to any of its dialects. (Goodman, 1966, Shuy, 1970).

Some historical examples with regard to the Italian language follow: in 1492, as Cristoforo Colombo made his voyage of discovery, a Spaniard, Antonio de Nebrija, wrote the first categorical grammar for Romance-language settings. For the first time precise guidelines that formalized the languages made easy its teaching in the New World—adding more unity to the newly-born nation of Spain. Italy, instead, had to wait until 1861 to be called a nation, because, as Metternich points out, "she (Italy) existed only as a geographic expression—being without a leader, unity, or flag."

Although political unity was finally reached, language is still a problem. Giovanni Meli, born March 16, 1740, in Palermo, did not know when he wrote his poem, "dimmi, dimmi a puzza nica", (tell me my little darling) that his writing was a dialect of a standard language spoken in Tuscany; and that in a few generations would be accepted as the official language of the "Italian Kingdom".

Poetic expression did not emanate only from the south or from Sicily, as is so frequently supposed. For example, Carlo Goldoni, in Venice (on February 26, 1707), wrote an entire comedy in dialect, entitled *Putta Onorata* (Honorable Girl), that, like other comedies of the time, became a success. Still, Italy was not unified, and lacked unity as a nation. A further example: On August 22, 1705, Domenico Tempio, of Catania—an outstanding poet—who superbly represented his time and culture, because his poetic style was distinct from all others. Yet he had very little, if anything, to do with the language of Dante. It was considered by his readers as modern, clear, and before its time. This poem, from his *La Creazione del Mondo* (The Creation of the World), is an example of his work. The speaker of standard Italian might puzzle over the spellings, and some of the words might be bewildering. Yet, it is quite understandable, because of its basic Latin roots:

"DI MORTI MURIRÀ LU SNATURATU
OMU ED ESPULSU DI LU PARADISU
MANCIRÀ PANI A STENTU TRAVAGGHIATU,
STU BUZZARUNI E FACCIA D'IMPISU,
E LA GARRUSA DONNA IN OGNI STATU
SARÀ, SUGGETTA ALL'OMU, ED E DICISU
DI FIGGHIARI CU STENTU E CU DULURI,
STA BUTTANA DI CULU SENZA ONURI."

From Rome came a nuance of, as well as a comedic poetic interpretation of the discovery of America. Cesare Pascarella, in 1854, rich with poetic license, describes how Christopher Columbus "made it", and what his experience was in the New World.

From La Scoperta de L'America (The Discovery of America) by Cesare Pascarella:

"—E QUELLI? —QUELLI? JE SUCCESSE QUESTA:
CHE MENTRE, LÌ, FRAMMEZZO AR VILLUTELLO
COSI ARTO, P'ENTRÀ NE LA FORESTA
ROMPEVENO LI RAMI CÓR CORTELLO,

VEDDERO UNO FREGNO BUFFO CÓ' LA TESTA
DIPINTO COME FOSSE UN GIOCARELLO,
VESTITO MEZZO IGNUDO, CO' 'NA CRESTA
TUTTA FORMATA DE PENNE D'UCELLO.

SE FERMORNO. SE FECCERO CORAGGIO:
A QUELL'OMO'. —JE FECER, —CHI SÈTE?—
—EH, —FECE, —CHI HO D'ESSE'? SO' UN SERVAGGIO.

E VOI ANTRI GUAGGIÚ CHI VE CE MANNA?—
—AH, —JE DISSERO, —VOI LO SAPERETE
QUANNO VEDREMO ER RE CHE VE COMMANNA,—"

In the same vein, in Catania, Nino Martoglio, in 1870, like Pascarella, describes historical facts, such as the invention of the wireless set, in an entertaining way through dialect. A colorful use of language and spontaneity truly reflects the personality of the time.

From Centona, by Nino Martoglio:

"IL TELEFRICO SENZA FILI"

"— SITA BESTIA, QUADRUPEDI, ANIMALI . . .
E NON VI DICU ARTRO, NON VI DICU' . . .
LE 'NTINNE CI SU' SEMPRI, TALI E QUALI,
E L'ÁMU VISTU JU E CUMPARI 'RICU . . .

CHIDDU CA NON C'È CHÍU, MIO CARU AMICU,
É IL FILO' . . . OH, BINIDITTU SAN PASQUALI' . . .

IL FILO, DINTRA IL QUALE, A TEMPU ANTICU
CURREVA IL TELEGRAMA NATURALI' . . .

LA MIA DIFOORTÀ, PERÒ, 'N È CHISSA:
C'E UN'ARTRA COSA, CA ANCORA NON SACCIU
E DELLA QUALI N'ARRISTAI SCOSSU:

CHOVI, MINTEMU, L'ACQUA SI SUBISSA? . . .
COM'È CA LA PAROLA DEL DISPACCIU
AGGHICA BELLA, ASCIUTTA COMU 'N OSSU?"

Of greater importance than historical background is the process of learning a dialect. There is a strong suggestion that all language teachers would do well to study such language processes. It is commonly agreed that the age of the student is a major factor. In case of a young student, the parent-child model of language acquisition is important, as is peer influence.

The parent/child model may have little in common with the classroom teacher/student model. Language acquisition in children does not require overt teaching from adults. For example, parents do not pay attention to grammatical correctness, but focus instead on whether the message is true or false—nor do children's grammatically correct utterances do a significantly better job of getting a message across.[1] The end of the critical period for learning a language is found to be around the age of 10-15 years. While some scholars believe that children and adults do learn in the same way, others suggest the hypothesis that neurological factors, particularly the development of cerebral dominance, are responsible for the child/adult differences.

Another theory widely held by linguistic specialists is that cognitive development, namely Piaget's formal operations, may be responsible. J. Schumann suggests that "psychological and social factors play an important role in child/adult differences."[2]

Stephen D. Krashen's view is that these two positions are both correct and are intimately related.[3]

To further illustrate the Piagetian point—during formal operations, children or adolescents became capable of abstract thought. This may contribute to the profound psychological changes they experience at this time. They become aware of others, particularly of being observed by others and are, during this time of biological change, subjected to intense feelings of self-consciousness. Most teachers who have dealt both with the children and adults in the classroom have noted how guilelessly the younger student will approach, saying a new word in a new language, or how eagerly a child will attempt a new feat—physical or mental. After adolescence this becomes rare, and adult students seem to be at the other extreme; they are embarrassed and awkward. The relationship between this "critical phase" concept and teaching standard Italian to a dialect-speaking adult American

can be seen as encompassing both the post-adolescent cognitive awareness and the psychological factors stemming from sentiment.

An adult second-generation student frequently has acquired his dialect subconsciously, much as a child learns his first language. Little input has occurred concerning grammar, and he probably has not used this "language" for reading or writing. Above all, the same cognitive factors still exist because of the age group. At this point, a third problem exists: this person's circumstance represents an extremely delicate situation. He has reached economic and social prominance and wants, for whatever reasons (a future trip to Italy or a newly-born nostalgia for his "roots", etc.) to study Italian. At this point, he will certainly face an unpleasant experience when he finds that his "Italian knowledge", stored in his memory bank from early childhood experiences, does not associate even remotely with standard Italian.

For example, subject pronouns such as "nuje" and "vuje" are the most difficult to eradicate, because linguistically they resemble the standard "noi" and "voi" closely, and because "voi/vuje" would be the archaic form of the more modern and less conservative "lei". This would be ignored because the person has not developed with the language in Italy, but rather clings to a form spoken to him by parents—or more likely by grandparents—who left the country in another time.

At this point, the teacher must, having assessed the "Italian" experience of such a student, explain that standard Italian will represent not a second language—but a third! The instructor will deal with each individual as a *tabula rasa* and will proceed to teach the new language to the person who will never forget his previous one for being so much related to his early life, his relatives, and emotionally-treasured experiences.

At the end of the academic year, the student will have in his possession three languages for three different uses at three different levels. The first is English and will continue to be spoken in business and with English-only speaking friends. The second language will be standard Italian, learned in school in the formal way, to be used in school, or in reading, or when traveling. And finally, his "Italian", learned informally in childhood—that being strongly linked with his personal life—will stay forever in his memory and in his heart, to be guarded as a sentimental treasure, and saved for special occasions, or for when he will talk in the privacy of his home with the old folks.

This problem is not unlike that of the older student who finds that the English he speaks has many grammatical flaws. He, too, must relearn. The major difference is that the speaker of flawed English attempts to forget the old and replace it with the new and correct, and the dialect-speaking student of Italian wants to retain his dialect and **add** another language. The teacher would benefit the students by encouraging the comparison of

all three languages, and by encouraging the student to retain his skills in the dialect while he is acquiring the skills needed for standard Italian.

FOOTNOTES

[1]. Brown, R., and C. Hanlon. "Derivational Complexity and Order of Acquisition in Child Speech," *Cognition and the Development of Language*, ed. John R. Hayes. New York: Wiley, 1970, p. 14.
[2]. Schumann, J. "Second Language Acquisition: The Pidginization Hypothesis ." Harvard University, 1975, p. 23.
[3]. Krashen, Stephen D. "The Critical Period Hypothesis and its Possible Bases," *Developmental Psycholinguistics and Communication Disorders*, eds. R. Rieber, and D. Aaronson. New York: New York Academy of Sciences, 1975, p. 224.

THE LEARNING SKILLS CENTER at DELAWARE STATE COLLEGE

Elise Brathwaite

There is a little poem entitled "It Pays to Advertise," which has prompted me to write this article on The Learning Skills Center at Delaware State College. It goes like this:

The Codfish lays a thousand eggs, The Homely Hen lays one
But the Codfish never cackles, To tell us what she's done
And so we spurn the Codfish, But the Homely Hen we prize
Which only goes to show you, That it pays to advertise.

In this spirit of advertising, the Center is taking on the wings of the Homely Hen and cackling, so that its cry could be echoed and re-echoed on and off campus. The Center has been in operation for just over six years and although the embryonic stage is over, the full grown product is not in full bloom mainly because of ignorance and neglect, and partly because of an unfounded idea that the Center is for the academically weak. Far from it, the Center is organized to produce academic excellence. At the moment, there are five segments in operation. These are Reading, Study Skills, Writing, Speech and Mathematics. The Center is open to all. Students can refer themselves, they can be required to register on the bases of test results or they can be faculty referred.

Delaware State College must be complimented for making this service available, but providing the facilities is not enough. The Center can only achieve maximum effectiveness if it receives maximum support from all sectors of the College community. At this point, I would like to reiterate that the Center is a resource laboratory and that its activities are not confined to the weak student. The courses are geared to serve the needs of individuals and ultimately the needs of the College.

Hundreds of students have passed through the Center, but somewhere there is a breakdown in communication which has hampered the enrollment toll. However, it is heartening to note that several excellent students have referred themselves to the Center, because they wanted to do concentrated work in an area in which they felt the need for in-depth study. To quote some examples, one student, who was contemplating becoming involved in student-government affairs, came to find out about the elements of parliamentary procedure. Another student wanted to find out about writing resumes, and a third student wanted to work in speed reading.

LOCATION:

The Center is located on the second floor of the William-Jason Library Learning Center, and is manned by a Director, Coordinators and Instructors in each of four areas of concentration, namely, Reading and Study Skills,

Writing, Speech and Mathematics.

Credits are given for each discipline as follows: Reading-3 Credits, Writing-1 Credit, Speech-1 Credit, Math-2 Credits, Study Skills-3 Credits. Even though these credits are not counted towards graduation, the hours can be used to help meet the financial aid requirement. More important, is the fact that the knowledge gained adequately compensates for any sacrifices that might have been made. Besides, mastering the basics makes college life more meaningful, in that courses may be encountered with confidence and satisfaction.

PROGRAMS:

Here are skeleton outlines of the programs.

Reading

Work is done in four major areas in the Reading Lab. These are: 1) Vocabulary, 2) Word Attack Skills, 3) Comprehension and Retention and 4) Rate Improvement.

The above areas are further subdivided so that word attack treats pronunciation, context clues and Greek and Latin roots and comprehension includes relationships, inferences and judgments. A rate book is used in the rate improvement section and Wordcraft Workbooks 1, 2 and 3 for vocabulary. Students are required to purchase the above texts. However, all additional books are supplied by the Center.

Study Skills

There are five topics in the Study Skills segment, namely: 1) Time Management, 2) Taking Lecture Notes, 3) Study Methods, 4) Organizational and Outlining Skills, and 5) Test Taking Skills.

College Study Skills by James F. Shepland is the required text. This course was developed because faculty members saw the need for concentrated work in general areas, which would help prepare the student for success in his college career.

Writing

There are ten modules in the Writing Program. These are:

Module I	Spelling
Module II	Punctuation
Module III	Parts of Speech
Module IV	Subjects, Verbs and Completes
Module V	Subject, Verb and Pronoun, Antecedent, Agreement
Module VI	Clauses
Module VII	Sentence Sense
Module VIII	Paragraph Writing
Module IX	Thesis Statement, Outlining, and
Module X	Theme Writing

Module VIII - Paragraph Writing is the only compulsory module. Students can test out of the others with a 75% score or more on the pre-test.

Speech

The objectives of the Speech program are to increase the student's understanding of the process of human communication in an interpersonal perspective, to develop his competence as a communicator by improving his language usage and increasing his working vocabulary, and to make him an active and appreciative listener. Units of concentration include: 1) grammar and usage, 2) vocabulary building, 3) impromptu one-three minute speeches, 4) planning an agenda and conducting a meeting, 5) interviews, 6) outlining, 7) role-play exercises, 8) analyzing a short text, 9) effective listening, 10) part reading of a play.

Mathematics

Programmed texts are used as the basic classroom tool in mathematics.

Arithmetic by Barker/Rogers/Van Dyke, 2nd ed. is the main text. The topics studied include, prime numbers, multiples, fractions, decimals, ratios, proportions, percentages and equations. Written, untimed tests are taken after every unit and the minimum acceptable level of proficiency is 75%. This course is designed to prepare students for the first year course in college algebra.

In addition to the above five programs, the Center also offers periodic workshops during the year so that students who are not enrolled in a regular course may attend one or all of these. To date, workshops have been offered in "Resume Writing", "Writing Effective Business Letters" and "Writing a Research Paper." Even a cursory glance at the topic offerings underlines their importance not only in college life but also in day-to-day living. I would, therefore, urge everyone to utilize this service. They run for a maximum of four sessions and could result in the difference between mediocre and excellent final grades in any course.

Another interesting fact is that a student could test out of a program at any time during the semester. There are frequent pre and post tests in specific phases of the program and students have no difficulty in monitoring their progress. It is the responsibility of students to ensure that folders are kept up-to-date so that a glance at an individual record sheet could tell which areas have been covered and which are still outstanding. Besides, the orderly organization of folders provides ample training for orderly study and work habits in the future.

Although individuals work at their own pace, there are suggested completion dates for each assignment which serve as check guides. The Center is always open and students are encouraged to come in during non-scheduled times to complete due assignments, to do additional practice work in a program area or to work ahead and finish in advance of schedule.

Much thought has been put into the planning of modules and units and post tests are done when the student feels confident that he will receive a satisfactory grade.

Sometimes instruction takes the form of a lecture, but most of the time the accent is on working in individual weakness areas. There is initial testing in each segment. For example, in Speech, students give a one to two minute autobiographical impromptu speech on tape. Grading is done on a four-point, five-category scale in Speech. Consideration is given to the ability to pronounce words as they are without deletions or additions, nonslovenly use of the main speech organs, lips, teeth and tongue and effective pauses. Seven Chapter Tests are given in Mathematics and a comprehensive final at the end of the course. In keeping with the mathematical discipline, grades are based on specific percentages. This format is as follows: Assignments - 10%, Quizzes - 10%, Chapter Tests - 40%, Final examinations 40%.

In Study Skills, there are five examinations in each area of concentration and a final examination covering all areas. Class notebooks, completion of class assignments on time and class participation are additional factors which determine the final grade in this Section.

Regular attendance is a major requirement all of the time. It is not difficult to envisage the damage which could occur from frequent absenses. Students could never keep abreast of assignments or important group lectures and discussions could be missed; scanty practice work will only result in poor post test results and a satisfactory completion of units will not materialize if sessions are poorly attended. In addition, a missed scheduled instructor conference will create rescheduling problems and interfere with the smooth operation of the course in general. Everyone is expected to be there and to be there on time. Such a forum provides ample training for good character development.

We diagnose and correct individual needs in the Learning Skills Center at Delaware State College, but we cannot do our work effectively without the cooperation and active participation of all. We have the remedies. We need the patients. Individuals know their needs. Do not ignore them. Come to the Center. We are there because you are here in College and we want you to st[illegible] as much as you want to yourself. We are extending an open invitation to the immediate College family, faculty and staff alike to use the resources of the Center fully.