Arousal, Stimulation Seeking, and Teaching-Style Preference

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Teaching-style preference was examined as a function of individual differences in physiological arousal and stimulation seeking. Twenty-nine school teachers were given the Sensation Seeking Scale, the Two-Flash Threshold (TFT) measure of trait arousal and a teacher questionnaire designed to measure teaching-style preference from a range of traditional (formal) to open (informal). A statistically significant correlation between the TFT and the teacher questionnaire indicated that teachers identified as low arousal tended to prefer a "traditional style" and those identified as high arousal tended to prefer an "open style" of teaching. Implications of the above findings are discussed.

La préférence des professeurs pour un style d'enseignement a été étudiée en fonction des différences qui existent entre ceux-ci, sur le plan de leur activité physique (en classe) et de leur recherche de motivation. On a donc distribué à 29 professeurs le Sensation Seeking Scale, le Two Flash Threshold (TFT) et un questionnaire ayant pour but de déterminer la préférence des professeurs pour un style d'enseignement, du plus traditionnel au plus progressiste. La relation significative qui existe entre le TFT et le questionnaire distribué aux professeurs et qui a été établie statistiquement, indique que les professeurs qualifiés de "peu actifs" ont une préférence marquée pour un enseignement de style traditionnel contrairement aux professeurs "très actifs" qui affichent une préférence marquée pour un enseignement plus ouvert ou progressiste. On étudie le implications de ces recherches.

Within this century, there has been considerable debate concerning the relative effectiveness of two major teaching methods. These methods have been generally categorized as traditional *versus* progressive (or open), teacher centred *versus* child centred, authoritarian *versus* democratic, or formal *versus* informal teaching styles (Cox and Dyson, 1975; Rathbone, 1971; Silberman, 1970). Bennett's (1976) comparison between informal and formal education, and subsequent finding that formal education fostered higher academic achievement, further intensified this debate.

Further, it could be hypothesized that there is a relationship between certain personality characteristics of a teacher and his/her teaching-style preference. Cunningham (1964), for example, discovered personality differences between team teachers who teamed successfully and teachers who teamed unsuccessfully. Unsuccessful team members tended to be more uncooperative, more insecure, more defensive, more excitable and less experimental than successful team members. Could it be that certain physiological and psychological personality characteristics are related and influence teaching-style preference? If so, could these known characteristics be used to more effectively place a teacher into an appropriate classroom environment?

Although there are many contributors to a person's teaching-style preference (e.g., past training, culture, political persuasion, philosophical orientation, and sundry personality variables), the focus of this paper is to examine the relationship between arousal, a bio-physiological contributor, and teaching-style preference. More specifically, we will investigate Farley's (1974) theory on the relationship between stimulation seeking and trait arousal level and teaching-style preference.

Farley (1974) has proposed a negative linear relationship between arousal and stimulation seeking, such that a person of high arousability would tend to avoid stimulation and a person of low arousability would seek stimulation in an effort to maintain an optimal level of arousal for effective biological functioning. When "optimal level of functioning" is included in this paradigm, this theory is best represented as an inverted *U*-shaped curve with both arousal (low-high) and stimulation seeking (high-low) positioned on the *X* axis, and effective biological functioning, from low to high, on the *Y* axis.

In his theory, Farley outlined the environmental and instructional differences between the traditional and open models. He predicted that the high arousal/low stimulation seeker would prefer the traditional style of teaching because of the lower activity level, the less varied experience, the lower frequency of student interactions, and the lower noise level of that model. Conversely, he also predicted that the low arousal/high stimulation seeker would prefer the open style of teaching because of the higher activity level, the more varied experience, the higher frequency of student interactions, and the higher noise level of that model.

The purpose of this study was to test his theory concerning the relationship between arousal and stimulation seeking on teaching-style preference. The first hypothesis was that there would be a negative linear relationship between arousal and stimulation seeking. If a statistically significant negative relationship was found, then both dimensions would be combined and *S*s would be differentiated into (1) high arousal/low stimulation seeking and (2) low arousal/high stimulation seeking to test the second hypothesis; if not, they would be analysed separately.

The second hypothesis tested the relationship between arousal and/or stimulation seeking with a measure of teaching-style preference. The prediction was that (1) low arousal and/or high stimulation seeking would be associated with a preference for the open style, and (2) high arousal and/or low stimulation seeking would show a preference for the traditional style of teaching.

METHOD

Subjects

Twenty-nine Canadian public school teachers, attending a two-day teacher conference, volunteered to participate in this study. There were

18 males and 11 females. Data collected indicated a normal distribution of age between 20 and 50, 34% between the ages 31–40. The majority of *Ss* taught students in Grades 4–6.

Measures

The study consisted of a physiological measure of arousal, as well as two paper and pencil measures of stimulation seeking and teaching-style preference.

Two-Flash Threshold (TFT)

The measure of trait arousal was assessed with the Grass Model PS2 Photo Stimulator. The TFT has been used in a number of studies requiring a measure of arousal (Farley, 1973; Rose, 1966; Venables, 1963). The rationale for the TFT is that paired flashes of light from the photo stimulator are viewed in different inter-flash intervals. The midpoint (in increments of five) between the interval when the *S* perceives the two flashes as "one" and as "two" flashes (10 msec apart) is recorded. This msec level is the operational definition of cortical arousal within the TFT method of measurement. Perceiving two flashes at faster msec intervals (low TFT score) is associated with higher arousal, and perceiving the two flashes at a slower inter-flash interval (high TFT score) is associated with lower arousal.

The TFT apparatus was modeled after that of Farley and Astorga (1974). It included a cork-lined box (10 in. × $9\frac{1}{4}$ in. × $14\frac{1}{2}$ in.) with a $\frac{1}{2}$ in. hole $4\frac{1}{2}$ in. from the top (the $14\frac{1}{2}$ in. dimension) and $5\frac{3}{4}$ in. from the side closest to the hole (the $9\frac{1}{4}$ in. dimension). The two-flash light unit was placed in this box, aligned with the hole, and held firmly in place with a feather pillow and a cardboard back (for further noise reduction). This box was placed in another box ($\frac{3}{4}$ in. × 18 in. × 14 in.). These two boxes (painted flat black) were then placed in a long rectangular box (20 in. × 31 in. × 26 in.) with one side removed and the inside painted flat black. A 100-watt frosted light bulb was positioned 21 in. from the top of the large rectangular box backside. The most important measurement requirement involved the distance of the *S*'s eye to the flasher hole. The hole was measured at $13\frac{1}{2}$ in. from the floor of the large rectangular box and $19\frac{1}{2}$ in. to the edge of the table; the chin rest was then raised $10\frac{1}{4}$ in. from the bottom of the table.

The Sensation-Seeking Scale (SSS)

The stimulation-seeking measure was the SSS (Zuckerman, 1971). The major sensation-seeking factor, derived from factor analysis, consisted of 22 forced-choiced item pairs stating a low and high stimulating activity.

Responses to the item pairs yield a score which differentiated *Ss* on a continuum from low to high stimulation seeking.

The Teacher Questionnaire (TQ)

The measure of teaching-style preference was assessed with a 50-item rating scale (Evans, 1971). *Ss* responded to statements concerning classroom procedures by circling a number on a 4-point scale (strongly disagree, disagree, agree, strongly agree). The TQ differentiated *Ss* on a continuous scale from a preference for traditional (low scores) to open (high scores) classroom environments.

Procedure

Teachers were asked to volunteer their time for the research project. As an incentive, they were given a chance to win a lottery ticket, which in turn might win a large cash prize.

Upon completion of the TQ and SSS, the TFT test was individually administered in accordance with the prescribed method used by Farley and Astorga (1974). The *S* was seated by the *E* in a secretarial chair which was adjusted for variability in height. The *S*'s chin was placed in the chin rest, and, as the following statement was read, the *E* presented the *S* with "one flash" (a short interflash interval of 20 msec) and "two flashes" (a long interflash interval of 150 msec).

"From this point you may see either one or two flashes. Here's an example of one flash ... And here is an example of two flashes. If you see one flash, press this button once, and if you see two flashes, press it twice. This signals to me how many you have seen.

"Do you have any questions?

"OK, put your chin in the chin rest and keep it there, and always look directly at the centre of the spot. The flash will come about every eight seconds. Now, put on the headphones to block out any room noises that might disturb you."

At the end of the statement, headphones (Silenta Model POP no. 3405) were placed over the *Ss* ears to block out any environmental noises (i.e., a faint "click" from the flashing light can sometimes be heard without the earphones, and this gives the *S* unwanted auditory clues). The *E* then presented the *S* with a series of interflash intervals (IFI) timed at eight seconds apart and in a 20 msec, 150 msec, 30 msec, 140 msec, 40 msec, 130 msec ... etc., sequence, to which the *S* responded to the flashes by pressing a hand-held button (Grayhill #35-1 single pole, single throw, momentary pushbutton) which flashed a signal light to the *E* (in accordance with the instructions). In this short-long IFI sequence the *E*

gradually approached the shortest IFI distance between the short and long IFIs (within 10 msecs). The cortical arousal measure was then taken at the IFI midpoint between the *S*'s reported "one flash" and "two flashes" (10 msec apart) in the series of three consistent and consecutive 1-flash /2-flash reports. A time limit of eight minutes was given to find the arousal level; after that time the measure was considered contaminated by fatigue. None of the *S*s exceeded the time limit.

RESULTS

No significant sex differences were found. Therefore, the sexes were combined for the remaining analyses. The means and (standard deviations) were as follows: TFT = 68.10 (16); SSS = 12.76 (3.83); and the TQ = 139.86 (10.27).

The first hypothesis, regarding a negative linear relationship between arousal and stimulation seeking, yielded a statistically non-significant correlation ($r = -.12$). Consequently, arousal and stimulation seeking were separated for the testing of the second hypothesis.

In the second hypothesis, it was predicted that low arousal would be associated with the open/informal teaching style and high arousal with the traditional/formal teaching style. The reverse was found. A significant correlation between the TQ and the TFT indicated that low arousal (a high TFT score) was associated with the traditional style, and high arousal (low TFT score) with the open style of teaching ($r = -.52$, $p < .01$).

The second hypothesis also predicted that low stimulation seeking would be associated with the traditional style and high stimulation seeking with the open style of teaching. This was not confirmed; there was a low and non-significant correlation between the SSS and the TQ ($r = .14$).

DISCUSSION

The following are possible reasons for the significant correlation in the opposite direction between TFT and TQ: First, the TFT is one of many arousal measures, and unfortunately, arousal measures yield low intercorrelations (Duffy, 1951). This might suggest that current instruments used to measure arousal are still primitive, or vary in sophistication, or that there are different arousal systems being tapped. Indeed, the arguments between the unitary arousal view (Berlyne, 1970; Malmo, 1970) and differential arousal systems view (Lacy, 1967; Routtenburg, 1968) are still being debated.

A second explanation might be to look for other dimensions operating in the classroom environment. Since this study did not use other measures of arousal for comparisons, the remaining discussion will focus on

possible environmental effects operating on arousal and stimulation seeking.

Discussions with teachers and student teachers have suggested two major sources of arousal-producing stimuli from a classroom environment. The first is more extrinsically oriented and consists of general noise level and frequency of social responses due to the number of interactions among the students. The second is more intrinsically oriented and consists mostly of arousal generated by the teacher as the centre of attention and as the organizer of the learning environment. If a teacher responds more to arousal generated by an extrinsic source, then "high-arousal" teachers would prefer a more quiet traditional classroom and the "low-arousal" teachers would prefer the more stimulation enriched open classroom. If, however, the most dominant source of arousal is of an intrinsic nature, then the "high-arousal" teacher would prefer the open classroom as an escape from the pressures and anxiety associated with being the centre of attention and the responsibility of organizing classroom lessons that might incur criticism. Conversely, the "low-arousal" teacher would seek out the extra stimulation of being the centre of attention and organizer of traditional classroom activities.

When comparing differences between formal and informal classrooms, Bennett (1976) found a higher frequency of *social interactions* within informal classrooms, and a higher frequency of *teacher interactions* within formal classrooms. Of these two competing sources of arousal, the extrinsic/student-oriented social interactions and the intrinsic/teacher-oriented interactions, it would appear that the intrinsic arousal source was most influential in determining teacher-style preference. Past research (Farley, 1974) indicates that we can assume that a high-arousal person will seek the lowest arousal source and the low-arousal person will seek the highest arousal source; both are motivated by the need to function at an optimal level of arousal.

The results of this study indicated that "high-arousal" teachers opted for the student-oriented interaction or informal (open) classrooms, while "low-arousal" teachers opted for the teacher-oriented interaction or formal (traditional) classrooms. Further research is needed to clarify these findings and assumptions.

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