

Resentful and Reflective Coping with Arbitrary Authority and Blood Pressure: Detroit

ERNEST HARBURG, PHD, EDWIN H. BLAKELOCK, JR., PHD, AND PETER J. ROEPER, MA

Two hypotheses about coping with an arbitrary authority, an angry boss, were tested: (1) styles of handling anger vary with social status, and (2) these styles are in turn related to blood pressure levels. Two styles of coping were tested: model R-R, Resentful vs. Reflective, and model I/O/R, Anger-In, Anger-Out, and Reflective. Handling an angry boss by Reflection is reported by more women than men, by those in middle-class areas rather than lower class, and does not vary by race. Working class report more use of Anger-Out than middle class who in turn report more use of Reflection. In general, the Anger-In response did not vary by race, sex, or area of residence (12–18%). For model R-R, Reflection of boss's anger was related to lower blood pressure when compared to Resentful responses, within sex, race, and residence groups. For model I/O/R, working-class, high stress persons who expressed Anger-Out showed the highest mean levels. Reflection is an appraisal response related to vascular and neural deceleration in stress experiments. This mode can be learned, and may aid in handling daily emotional-loaded stimuli to control blood pressure, along with learning a relaxation response.

INTRODUCTION

This article reports on tests of the hypotheses that (1) styles of handling anger vary with social status, and (2) these styles in turn are related to blood pressure levels. The styles of handling anger described in this research were generated by the classic work of Funkenstein et al. (1) in their book *Mastery of Stress*. They describe the major styles of "Anger-In" and "Anger-Out" as emergency responses to stressor situations, as well as the longer term adaptation called "mastery of stress." These coping styles were as-

sociated with a set of physiological responses during experimental stressor situations; specifically, Anger-In was associated with a higher level of blood pressure arousal than was Anger-Out. Furthermore these coping styles were associated with social class-linked parent training, e.g., upper-status male students showed a higher use of Anger-In response.

Both Anger-In and Anger-Out responses to attack however may be conceived as emerging from a more general orientation termed resentment (2, 3). This orientation is a true psychophysiological condition because it involves an integrated system of biological anger and psychological hostility. It can be transient or chronic. It is elicited by a perceived appraisal of an arbitrary (unjust, unfair) loss of possession. This possession is denoted in language by reference to "our," "my," or "me" as something owned or possessed, e.g., my rights, my person. The loss or threat of loss must be perceived as

From the Departments of Psychology and Epidemiology and the Program for Urban Health Research, The University of Michigan, Ann Arbor, Michigan.

Address reprint requests to: Ernest Harburg, Ph.D., Program for Urban Health Research, The University of Michigan, 405 S. Fourth Street, Ann Arbor, MI 48103.

Received for publication July 6, 1977; final revision received December 5, 1978.

arbitrary. The idea of an "arbitrary authority" has been presented by Fromm (4, 5). A series of studies indicates that when an attack or aggressive behavior by others is perceived as arbitrary, this arouses predominately angry or hostile feelings as opposed to when the attack is appraised as "justified" (6, 7). A transient or chronic state of resentment can only be relieved by retribution or perceived restoration of one's rights (8). One can attempt to achieve relief through suppression of angry feelings, and private fantasy and/or by direct, overt social action.

Although the literature suggests that the handling of one's anger and hostility seems associated with blood pressure levels (9-14) it is not clear what kinds of coping patterns are related to blood pressure levels of "normal" adults in daily life attack situations. For example, past experiments (15, 16) illustrate the idea that "inept assertiveness" in a problem situation where one is trying to exert influence is associated with persons having elevated blood pressure levels. But what coping mechanisms are associated with persons in problem situations whose pressures are low or normal, i.e., the "control" group? The research question becomes what kinds of coping style in handling anger are associated with lower levels of blood pressure? We are especially interested in the situational analogue of Funkenstein's (1) "mastery of stress" in normal interpersonal conflict situations.

The idea that varying coping styles for handling anger are related to social role and status carries implications that normal early socialization or learning of these role-status sets also involves learning of coping styles. Thus, Funkenstein's early report about upper-class family training of Anger-In was followed by Miller and Swanson's (17) later research into the socialization of handling anger. Essentially,

they found that middle-class parents teach anger control earlier than do working-class parents; that middle-class mothers more often reported use of psychological than corporal discipline and their sons more often used indirect expressions of angry feelings. In Funkenstein's work and in that by Miller and Swanson, the experimental stimuli that provoked angry feelings in both cases was the use of "unfair" criticism by an adult in authority who was at first perceived to be "fair."

A normally experienced daily situation comparable to such experimental situations occurs at work between employees and their first-line supervisors. The first-line supervisor or "boss" to most workers, is the gatekeeper to many of the rewards of the job, as well as its threats or negative aspects. Organizational studies (18, 19) generally focus on the first-line supervisor, as the classic man in the middle, and Argyris (20) has long ago observed that supervisors are not normally particularly good at interpersonal relations with the workers. The boss not only carries more organizational responsibility and authority than the worker, but being under daily pressure, will occasionally "blow up" in arbitrary ways. For the subordinate, or worker, such attacks may be highly stressful. A finding by Warren (21) shows that among 2,499 respondents in a variety of 28 Detroit neighborhoods 17% affirmed that in the past month (you) "got so tense at work," (you) "blew your stack," whereas 31% felt so "blue" or "low" it ruined their whole day. Furthermore, a year later more than half of the same persons again listed these same responses.

Recently a 5-yr prospective study of 10,000 Israeli male civil service workers (22) revealed that two of the nine most significant predictors ($p < 0.01$) in the in-

COPING WITH AUTHORITY AND BLOOD PRESSURE

cidence of hypertension (rates of new cases) out of 90 physical, psychological, and chemical variables were questionnaire reports that a worker would "brood" and "restrain retaliation" if hurt by a supervisor. In addition, four other psychosocial items significantly associated with incidence rates showed the same suppression of angry feelings in conflicts with co-workers and spouse. Conflict experience at work, therefore, as well as chronic threats of losing work (23), may be stimuli for raising blood pressure levels to sustained elevated levels which, in turn, are directly associated with higher rates of morbidity and mortality from stroke and certain forms of heart disease (24).

In this article, then, the focus is on the hypothetical coping reactions of employees to an angry boss as these reactions are influenced by the social status of sex, race, and area of residence, and the effect of these coping styles on blood pressure levels.

METHODS

Measure of Coping Styles

The initial hypothesis of this study was that certain coping reactions to an angry boss were conducive to an elevated blood pressure, and others were

not. In a pilot study (25), coding of responses to an open ended question of what the respondents (N = 215) would do if "your boss got angry at you for no good reason" elicited seven categories of coping responses. In the major study which followed, these seven coded categories were used in a fixed alternative survey format. A ranking of the seven types of responses was consolidated for analysis to yield three categories of coping style.

The first category, or "Anger-In," presumed to induce high blood pressure, is to ignore or walk away from the conflict situation leading to a static or declining reality situation and suppressed anger (12). The second coping category is to let the "Anger-Out" to the attacker. Although this circumvents suppression, over time it has questionable results in the worker's reality situation, i.e., the boss may react punitively when attacked in return. Use of an indirect response, e.g., going over the boss' head to someone higher up or to the union representative, can also produce undesired consequences. A third category of response, perhaps the most controlled solution, is for the worker to bypass anger, and by analysis of the problem, manage to restore a fair job situation. This would seem to be closer to the approach most favored by Argyris as "expressive learning" (20), by Maier as "problem solving" (18), and by Kagan's idea of being "reflective" (26). Thus, the reflex anger to an unfair attack is suppressed, whereas attention is directed at solving the problem associated with the boss' unjust anger. The calmer, reflective approach toward the arbitrary use of power may, in the long run, allow for "mastery of stress" (1).

The actual questionnaire item (see below), presented in a context of other work items, was "If your boss really did get angry and blew up at you for no good reason, what would you most likely do about it, just leave or protest or what?" The rank-order indices shall be referred to in this article as coping

Actual response categories selected by respondent	Code categories	
	Response model I/O/R	Response model R-R
"Just walk away from the situation."	(1) Anger-In (2) Anger-Out	(1) Resent
"Let the thing pass over without saying a word."		
"Report him to the union."		
"Protest to someone higher up."	(3) Reflect	(2) Reflect
"Protest to him directly."		
"Talk to him about it after he has cooled down."		
"Try to reason with him at the time."		

	Ecological sample			
	Black		White	
	High stress	Low stress	High stress	Low stress
	Working males			
$N =$	118	134	120	120
\bar{x} age =	40	40	40	43
\bar{x} weight =	176	181	176	181
	Working females			
$N =$	79	94	44	35
\bar{x} age =	43	41	42	47
\bar{x} weight =	156	149	147	141

categories, either model R-R or I/O/R. The hypotheses being investigated are that these categories are: (1) associated with sex or race or social class indicators in culturally prescribed ways, and (2) related to blood pressure level, i.e., Reflection is related to lower levels and Anger-In to higher levels.

Sample

The present study is part of a larger project concerned with hereditary and psychosocial correlates of blood pressure (27). The total sample design consists of eight subsamples derived from a $2 \times 2 \times 2$ design of sex, race, and high vs. low "ecological stress" areas. The data from this study were obtained in four census tract areas in Detroit in 1968-69 from interviews and blood pressure readings (28). The ecological stress index was composed of factor scores derived from the factor analyses of rates indicating socioeconomic stability among the 382 census tracts in the city of Detroit. Tracts were then divided into those predominantly black and white. Within each race group, the extreme factor scores allowed further selection of four high and low stress areas: black high stress, black low stress, white high stress, white low stress. These areas differed significantly in expected directions for rates of income, education, occupation, and socioeconomic status of the residents, crime, mobility, truancy, and welfare cases as well as in perceptions of the area, e.g., reports of crime-related events (29).

The sample was chosen from persons (1) living in a selected high or low stress area, (2) aged 25-60 (average 41 yr), (3) married and living with their spouse, (4) of the given race, and (5) having relatives in the Detroit Metropolitan Area. A door-to-door census was taken in each stress area to classify po-

tential sample members; then if classified, an interview was taken to verify the selection and to secure cooperation. Next, nurses of the same race then interviewed the verified persons and took three blood pressure readings in the first half-hour of medical history preceding an hour of questions on "personal stress."

Design

See table above.

Blood Pressure Measures

All 15 nurse-interviewers were given 20 hr of training in standard survey and blood pressure technique. Nurses used a mercury sphygmomanometer (checked each day) with Velcro cuff, at heart level, on the left arm (resting on table), with respondent seated; readings were taken to the nearest 2 mm. The range of correlations of the first three readings for both systolic and diastolic (fifth sound) within each of eight sex, race, and area groups was 0.84-0.96. A mean average of the first three blood pressure readings is used in analyses. Because age and relative weight are consistently related to blood pressure levels for these data and in other studies (24), we report data labeled as "adjusted" blood pressure. Adjusted blood pressure scores are observations with the variance of age and relative weight removed by standard regression method.

RESULTS

Are coping styles of handling anger related to the social status configurations in our design, namely, sex, race, and stress

COPING WITH AUTHORITY AND BLOOD PRESSURE

area? Table 1 shows, as anticipated from theory and data from cultural sex-role values and socialization, that handling an angry boss by Reflection is reported more by women than men ($p < 0.01$); more by middle-class (low stress area) than by working-class respondents (high stress area) ($p < 0.01$); but does not vary for blacks and whites. Working-class persons report a significantly greater use of Anger-Out than do the middle class, except for the black female subgroup. These findings confirm other results of measuring coping with anger from the larger Project (12). Anger-In responses ranged from 12 to 18% for three of the four race-sex groups, regardless of area, although the tendency is for the high stress residents to express more of this style. Unexpectedly, the white working females showed about 32% use of Anger-In but the numbers here are smaller than desired. The overall patterns tend to portray cultural modes, and serve as a measure of construct validity for the coping categories.

The hypothesis that these categories would be related to blood pressure was assumed to apply equally in all subsam-

ples. Data not shown reveal that for six of the eight sex-race-area groups there is a negative correlation between the I/O/R categories and age-weight adjusted blood pressure levels, among males for black high stress and white low stress groups and among all four groups of females.

Table 2 presents a correlation matrix of R-R and I/O/R categories and selected pertinent variables with these results: (1) the R-R model is, as expected, strongly correlated to the I/O/R model ($r = 0.89$); (2) thus, their relations to all the other variables are almost identical; (3) I/O/R is not significantly related to age or relative weight, but (4) I/O/R is positively related to higher socioeconomic variables, i.e., they use more Reflection to their boss's anger; (5) although I/O/R is related negatively to both diastolic and systolic; (6) both pressures are, as expected, related significantly to age and relative weight, only slightly negatively to socioeconomic levels, and strongly to each other. For convenience, therefore, the rest of this analysis will present only results for adjusted diastolic pressure.

Table 3 presents the results of a multivariate general linear model analysis of

TABLE 1. Percent of Coping Categories (R-R and I/O/R)

Categories	Male								Female							
	Black				White				Black				White			
	High stress		Low stress		High stress		Low stress		High stress		Low stress		High stress		Low stress	
	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N
1. Resent	63	(73)	52	(68)	63	(76)	48	(56)	44	(35)	40	(38)	53	(23)	40	(74)
2. Anger-In	15	(17)	12	(16)	15	(18)	12	(14)	18	(14)	12	(11)	32	(14)	31	(11)
3. Anger-Out	48	(56)	40	(52)	48	(58)	36	(42)	26	(21)	28	(27)	21	(9)	9	(3)
4. Reflect	37	(44)	48	(64)	37	(44)	52	(62)	56	(44)	60	(56)	47	(21)	60	(21)
Total	100	(117)	100	(132)	100	(120)	100	(118)	100	(79)	100	(94)	100	(44)	100	(35)

Main effects: sex, $p < 0.01$; race, NS; area, $p < 0.01$.

TABLE 2. Pearson Correlations of Coping Models and Selected Variables. Working Males and Females (N = 739)

	R-R	I/O/R	Age	Relative weight	Education	Family income	Occupational prestige	Diastolic
I/O/R	0.89*							
Age	0.04	-0.01						
Relative weight	-0.01	0.01	0.10*					
Education	0.13*	0.13*	-0.20*	-0.05				
Family income	0.09‡	0.09‡	-0.03	-0.06	0.33*			
Occupational prestige	0.13*	0.10*	-0.02	-0.07‡	0.55*	0.34*		
Diastolic blood pressure	-0.09‡	-0.09‡	0.24*	0.28*	-0.04	-0.05	-0.04	
Systolic blood	-0.06	-0.06	0.30*	0.28*	-0.06	-0.10*	-0.04	0.79*

* $p < 0.01$ (two-tail).

‡ $p < 0.05$ (two-tail).

§ See Duncan, OT: A socio-economic index for all occupations, in Reiss, AJ, Occupations and Social Status. New York, Free Press, 1961.

four main effects and two-way interactions for both raw and adjusted diastolic levels. Sex, race, and I/O/R coping categories are significant main effects (males, blacks, and resentful responses have higher levels than females, whites, and reflective responses). Of the interactions, race-area indicates blacks in high

stress areas and whites in low stress areas differ as expected (28), whereas I/O/R-area results will be discussed later.

Table 4 shows the diastolic levels and percent hypertensive (>95 mm) for the separate groups. The R-R model is tested by 1 vs. 4 in each set; seven of seven comparisons show those who use Reflection have lower pressures and percent hypertensive than Resentfuls (six of seven, $p < 0.05$, one-tail). Males show greater differences in percent >95 mm than females; whites, greater than blacks, and high stress, greater than low stress. For the I/O/R model, however, only four of seven showed the expected rank-order. For whites and for high stress area residents, persons with Anger-Out responses had the highest levels. These differences are only significant for the high stress group using analysis of variance of I/O/R and blood pressure ($p < 0.05$, two-tail).

Table 5 shows percent hypertensive (which corresponds closely with mean pressure levels) for 12 subsets of sex, race, and stress area. For the R-R model, 9 of 12 are in the predicted direction, 2 are tied

TABLE 3. P Levels for I/O/R Coping Model Sex, Race, and Area and Diastolic Pressure, Adjusted for Age and Relative Weight, for Working Males and Females (N = 739)

	Diastolic raw	Diastolic adjusted
Overall effect	0.0003	0.0001
Main effects		
I/O/R	0.03	0.02
Sex	0.04	0.01
Race	0.0001	0.0001
Area	NS	NS
Interactions		
I/O/R-Sex	NS	NS
I/O/R-Race	NS	NS
I/O/R-Area	0.14	0.04
Sex-race	0.17	0.15
Sex-area	NS	NS
Race-area	0.06	0.03

COPING WITH AUTHORITY AND BLOOD PRESSURE

TABLE 4. Means and Percent \geq 95 mm (Diastolic Pressure Adjusted for Age and Relative Weight) by Coping Response, for Sex, Race, and Stress Area

	\bar{x}	SD	% \geq 95	N	t tests*
Total					
1. Resent	83	10.9	14	383	1-4§
2. In	83	11.6	16	115	2-3
3. Out	83	10.6	13	268	3-4§
4. Reflect	81	10.8	9	356	2-4§
Males					
1. Resent	83	10.7	15	273	1-4‡
2. In	84	11.5	22	65	2-3
3. Out	83	10.4	14	208	3-4
4. Reflect	82	9.8	9	214	2-4
Females					
1. Resent	82	11.5	11	110	1-4§
2. In	83	11.7	8	50	2-3
3. Out	82	11.4	13(+)	60	3-4‡
4. Reflect	79	12.1	10	142	2-4
Black					
1. Resent	84	11.0	15	214	1-4§
2. In	86	12.3	21	58	2-3‡
3. Out	84	10.5	14	156	3-4
4. Reflect	82	11.8	13	208	2-4§
White					
1. Resent	82	10.6	12	169	1-4§
2. In	81	10.1	11	57	2-3
3. Out	82(+)	10.9	13(+)	112	3-4§
4. Reflect	79	9.0	4	148	2-4
High stress					
1. Resent	84	11.4	16	207	1-4§
2. In	83	12.7	16	63	2-3
3. Out	85(+)	10.8	17(+)	144	3-4§
4. Reflect	81	10.9	11	153	2-4
Low stress					
1. Resent	82	10.2	11	176	1-4
2. In	84	10.1	15	52	2-3‡
3. Out	81	10.2	10	124	3-4
4. Reflect	81	10.8	8	203	2-4§

* All F values for subset tests are $p < 0.01$.

‡ $p < 0.10$ (one-tail); § $p < 0.05$ (one-tail).

(+) Not in predicted I/O/R order.

and 1 is converse. Differences range from 3 to 10%, again with males greater than females and whites greater than blacks. For the I/O/R model, however, only 4 of 12 are in the predicted rank-order. Con-

trolling for eight subsets of sex-race-area (data not shown) reveals similar results for the R-R and the I/O/R model for both blood pressure levels and percent hypertensive, but the sample size for cells of

TABLE 5. Percent \geq 95 mm Diastolic and Coping Categories by Groups of Sex, Race, and Stress Area (High/Low)*

Groups	Percent hypertensives			
	Black male	White male	Black female	White female†
Race-Sex				
1. Resent	16% (141)	14% (132)	14% (73)	14% (37)
2. In	24 (33)	19 (32)	16 (25)	8 (25)
3. Out	14 (108)	13 (100)	13 (48)	25 (12)
4. Reflect	12 (108)	6 (106)	14 (100)	2 (42)
Race-area	Black high	Black low	White high	White low
1. Resent	22% (108)	9% (106)	10% (99)	16% (70)
2. In	26 (31)	15 (27)	6 (32)	16 (25)
3. Out	21 (77)	6 (79)	12 (67)	16 (45)
4. Reflect	18 (88)	9 (120)	2 (65)	6 (83)
Sex-area	Male high	Female high	Male low	Female low
1. Resent	17% (149)	14% (58)	13% (124)	8% (52)
2. In	20 (35)	11 (28)	23 (30)	5 (22)
3. Out	17 (114)	17 (30)	10 (94)	10 (30)
4. Reflect	8 (88)	15 (65)	10 (126)	5 (77)

* Diastolic pressure is adjusted for age and relative weight. Frequencies in parentheses are the number studied.

† For the white female subgroup only, percent \geq 90 was used because the percent \geq 95 was $N = 2$.

female respondents is less than desired. However, the pattern for high stress residents indicates that three of four show I/O/R pattern, i.e., Anger-Out responses have the highest blood pressure levels.

SUMMARY

These data show that coping responses to an arbitrary angry attack by one's boss are not randomly distributed. Women use Reflection more than men; and middle-class persons use Reflection more than the working class, whose mode is Anger-Out. In general Anger-In is reported by only 10–20% of the people surveyed.

In turn these coping responses are re-

lated to blood pressure levels and percent \geq 95 mm. Persons whose responses to boss attack are Resentful (Anger-In or Out through direct or indirect protest) tend to have significantly higher blood pressures than those who use a Reflective response.

Working-class, high stress area residents who respond to boss's anger with Anger-Out have the highest levels of pressure compared to their neighbors who report Anger-In or those with lowest pressure, who use Reflection.

These results hold with blood pressure adjusted for age and relative weight, for both men and women, blacks and whites. Reflection yields lower mean pressures than resentment even within normal, borderline and hypertensive categories in

COPING WITH AUTHORITY AND BLOOD PRESSURE

this sample of married persons, 25–60 yr old, residing in high and low stress areas in Detroit (1968).

DISCUSSION

Separate studies have shown that focusing one's attention on receiving auditory or visual stimuli, e.g., listening to an emotional monologue, watching a flickering light, is associated with heart rate deceleration when compared to base-line and rest periods (30–33). This intake mode of "wanting to accept" incoming stimuli appears also to decrease blood pressure levels (31, 32). The concept of an "analytic attitude" was developed to describe the psychological mechanism of this critical finding. This attitude was defined as the tendency "to reflect upon the differential validity of alternative responses in problem situations in which two or more response tendencies are present simultaneously" (34). Evidence of this attitude is inhibition of impulsive solutions (less errors) in analyzing discrepant visual cues and reporting similarities. Thus, both boys and girls who took a longer response time to tachistoscopic problems made fewer errors than those who gave impulsive, short-time responses (35). Reflective/analytic boys also had lower cardiac rates and respiratory variability during demands for attention than "impulsive" boys (34).

We can speculate from these phenomena that adults who analyze an arbitrary attack by the boss and either delay response for later discussion or try to reason at the time also appear to be "reflective" problem solvers; whereas those who try to ignore or deny the meaning of the attack by saying nothing or walking

away (Anger-In) or respond by attacking or protesting to higher-ups (Anger-Out) are relying on impulsive-generated solutions. This "set" to analyze or reflect about emotionally provocative or cognitively novel stimuli (e.g., conflictful interpersonal encounters with an employer, or other authority figures) rather than to respond reflexively or impulsively appears to be related to lower blood pressure levels in our survey data.

Other work by Lazarus and colleagues encourages this interpretation (36). They build on Arnold's concept of "appraisal" (37). This refers to an intuitive-cognitive process which intervenes between the stimuli and the emotional reaction and evaluates percepts as potentially benign or harmful or neutral. Lazarus labels this as "primary appraisal." "Secondary appraisal" refers to the internal processing of coping alternatives concerning the percepts to achieve beneficial outcomes or to master harmful ones. "Reappraisal," the third aspect, refers to reflection about the original evidence or about feedback from action which induces new evidence.

What might be called "primary mediation" would be altering the appraisal process per se and thereby affecting autonomic consequences. Thus skin conductance varied directly with disturbing events in a film on subincision (a primitive ritual of cutting, with a stone knife, the penis and scrotum of young boys entering manhood). But by varying the soundtrack in several modes, i.e., "traumatic" (which emphasized the emotionally disturbing ritual elements), and "intellectualization" (which set a detached, studious, analytic view of the film), skin conductance and self-reports of distress were aroused by the trauma mode and reduced by the analytic mode (38). Similar

results with heart rate and skin conductance were even stronger when the coping orientations were introduced before a film (on wood mill accidents) (33), presumably allowing the subject more time for mediation work on primary, secondary, and reappraisal processing. In other studies, groups waiting from 5 seconds to one minute while expecting an electric shock rose steadily in emotional disturbance, but after a 3- or 5-minute wait, such automatic disturbance fell sharply, presumably again through reflection, "thinking through" or reappraising the situation, reducing threat and thereby reducing stress responses (39).

The data in this present study show that this reflective mode (to an angry boss) is not randomly distributed, but is associated with sex and social class residence. Patently, this mode and others can be acquired by training in this culture. We have already remarked that prior experiments indicate that coping modes of handling anger vary with social class (1, 17) (both experiments used only young, white males). Later inquiry by McCall and Kagan (40) showed that infants also (1) exhibited cardiac deceleration when fixating attention on novel stimuli and (2) at 4 months this cardiac deceleration was greater for "upper middle-class" than "lower middle-class" babies. The acts of attention to novel stimuli as well as fixation time both increased for upper middle-class children at 13 months compared to lower middle-class children. Both of these effects were stronger for girls than boys. (Other studies indicate more active vocabulary and greater speech facility at earlier ages are also associated with being middle class and female.) A small study ($N = 44$ 5-month-old babies) further suggests that

longer fixation time and active manipulation of novel stimuli by babies was related more to having "high-attentive" than "low-attentive" mothers (41).

Thus intellectual training such as increased vocabulary, increased verbal facility, increased fixation time to novel stimuli (allowing finer discrimination of information in the original evidence) may all encourage a more sophisticated, reflective primary appraisal mode. Conversely, studies of panic behavior (reflexive mode) in mass outbursts by Cantril et al. (42), Johnson (43), and Killian (44) are more associated with persons having less formal education. Data from the study here reported also reveal a significant positive correlation of lower education (and income and socioeconomic stress level) with use of a resentful mode.

Next, we must note the finding, discrepant from our expectations, that persons in high stress areas who reported more Anger-Out to an angry boss had the highest pressure (85 mm) compared to neighbors using Anger-In (83 mm) or Reflection (81 mm). Data not shown suggest that this effect holds only for young adults in high stress areas (25-39 yr) and not for those 40-60. Furthermore, regardless of area, it appears to hold more for young blacks. More precise analysis was unwarranted due to low sample sizes. However, a prior paper (45) reported that younger blacks with elevated diastolic levels (≥ 90 mm) reported significantly more financial- and job-related stressors than older blacks. Perhaps resentful, Anger-Out to a (usually white) boss chronically provokes higher blood pressure responses for younger black workers residing in high stress, working-class areas. Further research should test the hypothesis that (resentful) "inappropriate assertiveness" is

COPING WITH AUTHORITY AND BLOOD PRESSURE

associated with elevated pressure (15, 16) as well as "inappropriate submissiveness" (46, 47).

Again, although it is generally true that American blacks have higher blood pressure than whites, the larger Detroit Project reveals two facts about working-class blacks in the high stress area: (1) they have significantly higher blood pressure than middle-class blacks in the low stress area, but (2) the high majority, in fact, have normal blood pressure levels (28). There are, therefore theoretical and practical reasons to learn more about the social and psychological mechanisms which are associated not only with high blood pressure, e.g., resentful appraisal modes, but with "immunity" mechanisms from high blood pressure, such as using a reflective style of handling anger (and fear) when attacked. Thus, much has been recently written about nondrug therapy interventions to lower blood pressure in a preventive mode, e.g., inducing relaxation response (48).

Our data suggest that a reflective appraisal mode to daily conflict might interact with relaxation training to induce lower pressures. An interaction effect was found by matching an appraisal mode with an intervention mode, e.g., "intellectualizers" showed more stress reduction (skin conductance and self-reports) to an emotional film with an "intellectualized" sound track than with a "denial" sound track (38). Recently, Klorman et al. (49) showed that women with low fear of mutilation exhibited cardiac deceleration (orientation response) to mutilation stimuli whereas high-fear women showed arousal. Benson's relaxation response, Henry observes (50), is reduced by a "passive attitude," which may shift mental processes away from "logical, external-

oriented" left-hemisphere-controlled thought to right hemisphere processes. Henry further suggests however that this daily relaxation training is not enough. It must be accompanied by enlarging the person's abilities to reduce conflict in daily life. An analytic-reflective attitude, which may induce an orientational response to novel stimuli might be the contribution of the left-hemisphere processes toward this aim. Thus, training in both a relaxation response and a reflective appraisal mode in conflict situations would draw in a balanced way from both brain hemisphere capacities and "interact" to keep the reflexive cardiovascular responses (especially blood pressure) under individual control.

One aspect of both responses concerns the unknown mechanism of "detachment." Thus, "cerebral filtering" (analytical, reflective, intellectualizing) of strongly novel stimuli focuses cognitive attention on the evidence of the perceptual problem and simultaneously "detaching" the impulsive or autonomic responses, which are set reflexively to attack or to avoid by immobility or flight. This detaching of reflexive responses while reflecting on the evidence to resolve a social problem appears to correspond with elements of "reality-testing" and "extinguishing" of fear responses in "impulsive therapy" (51). Such therapy is aimed at resolving chronic phobias, but chronic anger reflexes to specific authority figures might also be amenable to relief. Any training program however (to relax, to reflect, to detach) must start before hypertension occurs, because there is some evidence that denial and suppression of conflictful, noxious percepts may become the primary appraisal mode for hyperreactive pressor systems (52, 53).

Our thanks to Dr. George Williams and Mr. James Naessens, Department of Biostatistics, School of Public Health, The University of Michigan, and Mr. Feridun Ozgoren, Program for Urban Health Research, The University of Michigan. This work was supported in part by Michigan Heart Association; National Heart and Lung Institute, HE 13329-01, 02, 03; American Heart Association; National Institute of Mental Health, MH 20261-01.

REFERENCES

1. Funkenstein DH, King SH, Drolette ME: *Mastery of Stress*. London, Oxford University Press, 1957
2. Scheler M: *Resentment*. Glencoe, Ill., The Free Press, 1961
3. Harburg E, Kasl SV, Tabor J, Cobb S: The intrafamilial transmission of rheumatoid arthritis—IV. Recalled parent-child relations by rheumatoid arthritics and controls. *J Chronic Dis* 22:223-238, 1969
4. Fromm E: *Man for Himself*. New York, Rinehart, 1947
5. Fromm E: *The Sane Society*. New York, Rinehart, 1955
6. Pastore N: The role of arbitrariness in the frustration-aggression hypothesis. *J Abnorm Psychol* 47, 1952
7. Rothaus R, Worchal P: The inhibition of aggression under nonarbitrary frustration. *J Pers* 28, 1960
8. Heider F: *The Psychology of Interpersonal Relations*. New York, John Wiley & Sons, 1958, pp. 265-269
9. Ayman D: The personality type of patients with arteriolar essential hypertension. *Am J Med Sci* 186:212-223, 1933
10. Wolf S, Wolff HG: A summary of experimental evidence relating life stress to the pathogenesis of essential hypertension in man, in Bell ET, *Hypertension*. Minneapolis, University of Minnesota Press, 1951
11. Schacter J: Pain, fear and anger in hypertensives and normotensives: A psychophysiological study. *Psychosom Med* 29:17-29, 1957
12. Harburg E, Erfurt JC, Chape C, Hauenstein LS, Schull WJ, Schork MA: Socio-ecological stress, suppressed hostility, skin color, and black-white male blood pressure: Detroit. *Psychosom Med* 35(4):276-296, 1973b
13. Hokanson JE: Vascular and psychogalvanic effects of experimentally aroused anger. *J Pers*, 29:30-39, 1961
14. Gentry WD: Bi-racial aggression: Effect of verbal attack and sex-of-victim. Paper presented to South-eastern Psychological Association, Miami, 1971
15. Kalis BL, Harris RE, Sokolow M, Carpenter LG, Jr: Response to psychological stress in patients with essential hypertension. *Am Heart J* 53:572, 1957
16. Harburg E, Julius S, McGinn NF, McLeod J, Hoobler SW: Personality traits and behavioral patterns associated with systolic blood pressure levels in college males. *J Chronic Dis* 17:405-414, 1964
17. Miller DR, Swanson GE: *Inner Conflict and Defense*. New York, Henry Holt and Company, 1960
18. Maier NRF: *Problem Solving Discussions and Conferences: Leadership Methods and Skills*. New York, McGraw-Hill Book Comp., 1973
19. Likert R: *New Patterns of Management*. New York, McGraw-Hill Book Comp., 1971
20. Argyris C: *Interpersonal Competence and Organizational Effectiveness*. Homewood, Ill., Dorsey Press, 1962
21. Warren DI: *Neighborhood and Community Contexts in Help Seeking, Problem Coping, and Mental Health: Data Analysis Monograph*. Program in Community Effectiveness, Ann Arbor, August 31, 1976
22. Kahn HA, Medalie JH, Neufeld HN, Riss E: The incidence of hypertension and associated factors: The Israel ischemic heart disease study. *Am Heart J* 84:171-182, 1972
23. Kasl SV, Cobb S: Blood pressure changes in men undergoing job loss, preliminary report. *Psychosom Med* 32:19-38, 1970

COPING WITH AUTHORITY AND BLOOD PRESSURE

24. Stamler J, Stamler R, Pullman TN: The Epidemiology of Hypertension. New York, Grune and Stratton, 1967
25. Harburg E, Schull WJ, Erfurt JC, Schork MA: A family set method for estimating heredity and stress: I. A pilot survey of blood pressure among Negroes in high and low stress areas, Detroit, 1966-67. *J Chronic Dis* 23:69-82, 1970
26. Kagan J: Individual differences in the resolution of response uncertainty. *J Pers Soc Psychol* 2:154-160, 1965
27. Harburg E, Erfurt JC, Schull WJ, Schork MA, Colman R: Heredity, stress and blood pressure, a family set method: I. Study aims and sample flow. *J Chronic Dis* 30:625-647, 1977
28. Harburg E, Erfurt JC, Chape C, Hausenstein LS, Schull WJ, Schork MA: Socio-ecological stressor areas and black-white blood pressure: Detroit. *J Chronic Dis* 26:595-611, 1973a
29. Kasl SV, Harburg E: Perceptions of the neighborhood and the desire to move out. *J Am Institute of Planners* 38:318-324, 1972
30. Lacey JI: Psychophysiological approaches to the evaluation of psychotherapeutic process and outcome, in Rubinstein EA, and Parloff MB (eds.), *Research in Psychotherapy*. Washington, D.C., National Publishing Co., 1959
31. Lacey JI, Lacey BC, Moss HA: Situational determinants and behavioral correlates of autonomic response patterns, in Knapp PH (ed.), *Expression of Emotions in Man*. New York, International Universities Press, 1963
32. Obrist PA: Cardiovascular differentiation of sensory stimuli. *Psychosom Med* 25:450-459, 1963
33. Lazarus RS, Opton EM, Jr, Nomikos MS, Rankin NO: The principle of short-circuiting of threat: Further evidence. *J Pers* 33:622-635, 1965
34. Kagan J, Rosman BL: Cardiac and respiratory correlates of attention and an analytic attitude. *J Exp Child Psychol* 1:50-63, 1964
35. Kagan J: impulsive and reflective children: Significance of conceptual tempo, in Krumboltz JD (ed.), *Learning and the Educational Process*. New York, Rand-McNally, 1965
36. Lazarus RS, Averill JR, Opton EM, Jr: The psychology of coping: Issues of research and assessment, in Coelho GV, Hamburg DA, Adams, JE, *Coping and Adaptation*. New York, Basic Books, 1974
37. Arnold MB: *Emotion and Personality* (2 volumes). New York, Columbia University Press, 1960
38. Speisman JC, Lazarus RS, Mordkoff AM, Davison LA: The experimental reduction of stress based on ego-defense theory. *J Abnorm Soc Psychol* 68:367-380, 1964
39. Nomikos MS, Opton EM, Jr., Averill JR, Lazarus RS: Surprise versus suspense in the production of stress reaction. *J Pers Soc Psychol* 8:204-208, 1968
40. McCall RB, Kagan J: Stimulus-schema discrepancy and attention in the infant. *J Exp Child Psychol* 5:381-390, 1967
41. Kagan J: The many faces of response. *Psychology Today* 1:22-27, 1968. (See reference in this article to a study by Judith Rubenstein.)
42. Cantril H with Gaudet H, Herzog H: *The Invasion from Mars*. Princeton, N.J., Princeton University Press, 1947
43. Johnson DM: The phantom anesthetist of Mattoon: Field study of mass hysteria. *J Abnorm Soc Psychol* 40:175-186, 1945
44. Killian LM: *A Study of Response to the Houston, Texas Fireworks Explosion*. Washington, D.C., National Academy of Sciences-National Research Council, Disaster Research Group, Disaster Study No. 2, 1956
45. Harburg E, Ozgoren F, Wolfe R, Leech S: Social-psychological factors and blood pressure among blacks and whites in Detroit. Paper presented at the American Heart Association 18th Annual Conference on Cardiovascular Disease Epidemiology, Orlando, Florida, March 13-15, 1978
46. Harris R, Sokolow M, Carpenter L, Friedman M, Hunt S: Response to psychological stress in persons who are potentially hypertensive. *Circulation* 7:874, 1953
47. Shapiro AP: An experimental study of comparative responses of blood pressure to different noxious stimuli. *J Chronic Dis* 13:293, 1961
48. Benson H: Systemic hypertension and the relaxation response. *N Engl J Med* 296:1152-1156, 1977
49. Klorman R, Weissberg RP, Wiesenfeld AR: Individual differences in fear and autonomic reactions to affective stimulation. *Psychophysiology* 14:45-51, 1977

ERNEST HARBURG et al.

50. Henry JP: Relaxation methods and the control of blood pressure. *Psychosom Med* 40:273–275, 1978
51. Leitenberg H: Behavioral approaches to treatment of neuroses, in Leitenberg H (ed.), *Handbook of Behavioral Modification and Behavior Therapy*. Englewood Cliffs, N.J., Prentice-Hall, 1976
52. Sapira JD, Scheib ET, Moriarty R, Shapiro AP: Differences in perception between hypertensive and normotensive populations. *Psychosom Med* 33:239–250, 1971
53. Henry JP, Cassel JC: Psychosocial factors in essential hypertension: Recent epidemiologic and animal experimental evidence. *Am J Epidemiol* 90:171–200, 1969