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SURVEY OF ESTHETIC QUALITIES OF MILITARY HELMETS

Paul H. Ellis
Bernard M. Corona
R. Douglas Jones
R. Bradley Randall
Hayden A. Scheetz

June 1972

HUMAN ENGINEERING LABORATORY

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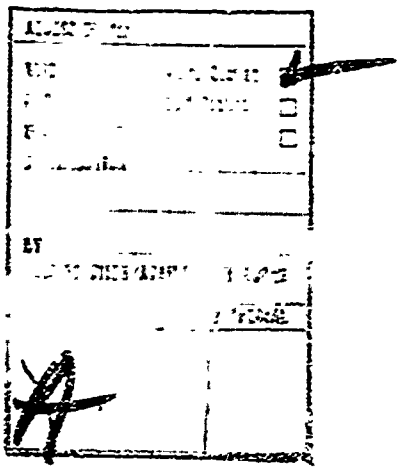

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Paul H. Ellis, Bernard M. Corona, R. Douglas Jones, R. Bradley Randall, & Hayden A. Scheetz

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13 ABSTRACT

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APPROVED: John D. Weisz
JOHN D. WEISZ
Director
Human Engineering Laboratory

HUMAN ENGINEERING LABORATORY
U. S. Army Aberdeen Research & Development Center
Aberdeen Proving Ground, Maryland

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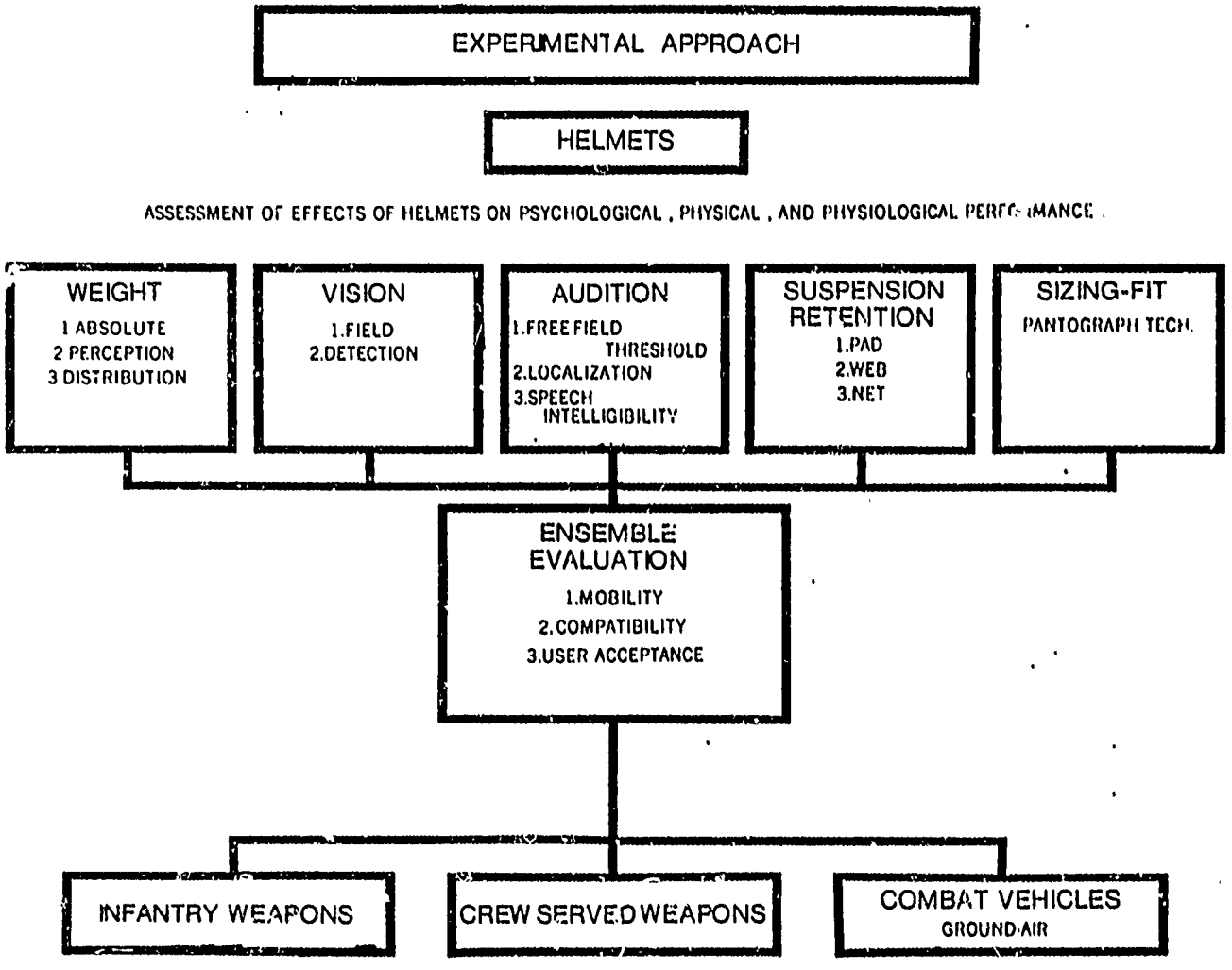

Fig. 1. HUMAN FACTORS EVALUATION OF INFANTRY HELMETS: EXPERIMENTAL APPROACH

SURVEY OF ESTHETIC QUALITIES OF MILITARY HELMETS

INTRODUCTION

The experiment described in this paper is one of a number of current and projected investigations aimed at developing comprehensive criteria for the evaluation of life-support systems. As a participant in the U. S. Army Materiel Command (AMC) Five-Year Technical Plan for Personnel Protective Systems, the primary responsibility of the Human Engineering Laboratory (HEL) is to provide a battery of standardized tests applicable to existing and prototype armor ensembles. The overall experimental approach shown in Figure 1 indicates that the standardized tests will ultimately be based on laboratory experiments and field studies, objective and subjective measures, and individual and group performances.

The idea of stylizing military armor and helmets is as old as the concept of armored protection itself. Ancient Greek armor was very ornate, and the classic picture of the crusading knight is permeated with armor and helmets which distinguished the wearer from his peers. The French soldier of WW I wore a helmet which protected against fragmentation, but also set the image of what a French soldier really was; his helmet had national character. In Vietnam, American soldiers have displayed varying degrees of artistic ability by sketching on the camouflage covers of the M1 helmet, thus expressing some individuality in helmet esthetics.

These historical precedents lead us to see that soldiers are concerned not only about ballistic protection, comfort and weight, but also about the appearance of their helmets. Under the Five-Year Technical Plan for Body Armor and Helmets, the question of what constitutes an esthetically pleasing military helmet will be addressed. There are two ways of using such information in the Five-Year Plan. First, any indication of a pleasing helmet style will be of value to design personnel. When designing contours and edgecuts of a helmet, the designers may occasionally be faced with choosing between several shapes of equal ballistic protection and functional merit. Esthetic preference data will enable the designers to make the choice that will lead to greater user acceptance. Second, if a helmet style which has a high acceptance level can be identified, that style can be used as a reference against which other helmet styles can be compared.

Methods for this type of investigation must be developed before any usable information can be gained. As a first effort towards methodological development, and to determine the feasibility of such an investigation, HEL has conducted a survey using sketches of present and futuristic helmet designs as the objects of experiment interest.

METHOD

Subjects

One hundred enlisted infantrymen, E-2 through E-7, ages 17 through 37, served as subjects. These men were selected to participate according to their availability on the days the test was given.

Apparatus

Nine sketches of present and futuristic helmet designs as conceived by a qualified industrial designer (Fig. 2) were presented. Included in the group were the M1 and the Hayes-Stewart helmets. Subjects responded to the sketches on data-collection sheets (Appendix).

Procedure

On the day of testing, subjects were shown the nine sketches, mounted in rows of three on a Bristol-board backing. Each sketch had a number clearly printed on the bottom righthand corner. Subjects were asked to look each sketch over and select the numbered helmet they felt would be best for ceremonial purposes. The term "ceremonial purposes" was used in an effort to have the subjects judge the helmets solely on their esthetic merit and not on their judgment of its ballistic protection or functional desirability. They were also asked to make a choice of the helmet they liked second best and the one they liked least. Each subject was then asked to state why he chose his favorite, why he picked his first choice over his second, and what he did not like about the helmet he selected as least appealing. Each subject wrote his answers on individual data sheets given to him by the test officer.

RESULTS

Table 1 shows the results of the survey. Helmet 53 was clearly the favorite. Helmet 53 is a sketch of the present M1 steel helmet. Forty-nine percent of the subjects selected this helmet first, while 17 percent selected it as their second choice. Combined first and second choices represent 66 percent of sample. Twenty-one percent chose Helmet 12 as first, while 25 percent selected Helmet 12 as second choice, for a combined total of 46 percent. Thirty-four percent liked Helmet 47 least, while 29 percent rejected Helmet 89. The Hayes-Stewart (Helmet 70) had a combined preference of 17 percent and was rejected by 20 percent of the sample. The comments elicited by asking what was liked or not liked yielded no regularity and do not lend themselves to inclusion in this report. This fortifies the rationale behind avoiding open-ended questions such as: what do you think of . . . . ., how do you like . . . . ., or how would you improve . . . . . ?

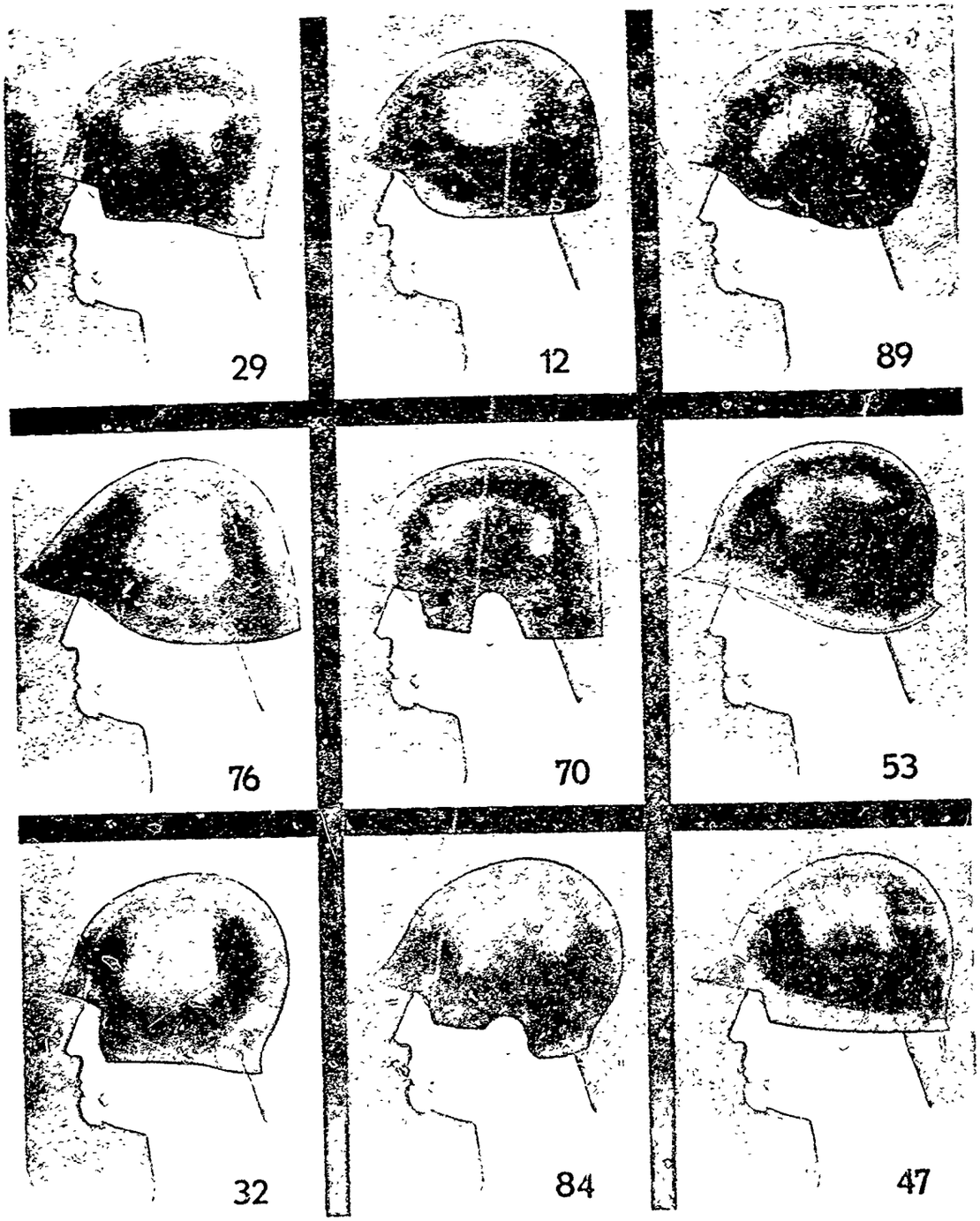

Fig. 2. PRESENT AND FURTURISTIC HELMET DESIGNS

DISCUSSION

The findings of this survey demonstrate that it is possible to identify patterns in esthetic preference for military helmets. The preference for the present M1 helmet is not surprising. The image of the American infantryman equipped with the M1 helmet has developed since early World War II. Many of the fathers and brothers of the present generation of soldiers wore this helmet during service in World War II and Korea, so the M1 helmet has acquired a good deal of national character. There are many reasons why the future helmet form should be changed; however, the esthetic aspects of the M1 seem satisfactory.

The high preference shown for the M1 helmet is convenient for the selection of a reference style. That two-thirds of the men participating in the survey selected the M1 first or second indicates that future helmet designs can be judged against a reference which will provide strong competition. The comparison procedure for future helmets could involve the use of esthetic judgments between candidate helmets and the M1 reference. Assigning the value of one to the percentage score of the M1, an index of esthetic value could be calculated for the various candidate helmets. The procedure for indexing can be expressed as follows:

$$I = C_{A_{1+2}} - (C_{A_3} - M_3)/M_{1+2}$$

where I = the index score $C_{A_{1+2}}$ = percentage of combined preferences

for the candidate helmet C_{A_3} = percentage of rejections for candidate helmet

M_{1+2} = percentage of combined preferences for M1

M_3 = percentage of rejections for the M1 helmet.

Applying this procedure to representative helmets for this survey, shows an index score for Helmet 12 of .68 while Helmet 70, the Hayes-Stewart, shows an index of -.03.

To further develop procedures sensitive to evaluating candidate helmets on the basis of esthetic preference, several techniques are being considered. One such technique involves the fabrication of fiberglass or vacuum-formed plastic helmet shells to be shown to the subjects, following the same procedure as used when showing the helmet drawings. This might be done by placing these helmets on appropriate uniformed manikins to provide a complete image of the soldier.

Another technique involves the use of a semantic differential rating scale. A preliminary survey using this technique to evaluate user acceptance has shown an esthetics factor which may be useful in evaluating esthetic preferences of the user population.

APPENDIX

DATA COLLECTION SHEETS

DATA SHEET

SUBJECT NO. _____ AGE _____

RANK _____ UNIT ASSIGNMENT IN RVN _____

WEIGHT _____ HEIGHT _____

Consider that the helmets displayed before you are for cermonial purposes. These helmets will be worn by MPs, honor guards, etc., and are intended to sharpen up the Army's appearance and create a "new Army image."

1. From these helmets, pick the best looking as far as you are concerned.

   Number _____

2. Now select the second best helmet form.

   Number _____

3. Now select the worst looking helmet form.

   Number _____

4. What is there about your first choice that caused you to select it. (Be brief).

_____

_____

5. What is there about the worst helmet form that you don't like.

_____

_____

6. What caused you to select choice 1 over choice 2.

_____

_____