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A COMPARISON OF TECHNIQUES FOR UTILIZATION OF MEDIA WHEN TEACHING CLOTHING CONSTRUCTION

A DISSERTATION

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in partial fulfillment of the requirements for the

degree of

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BY

KATHLEEN W. LIPP

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A COMPARISON OF TECHNIQUES FOR UTILIZATION OF MEDIA

WHEN TEACHING CLOTHING CONSTRUCTION

APPROVED BY

DISSERTATION COMMITTEE

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CHAPTER I

INTRODUCTION

There are approximately forty million women in the United States who engage in the construction of clothing, and a great many of these started their clothing construction activities in our public schools. Teachers are aware of the need for providing the best instruction they can manage.

In this study, methods of teaching clothing construction in Home Economics were of particular interest for experience had led to many questions. Educators are also aware of the need to evaluate their methods. Since many future teachers move through our college classes, it was deemed prudent to evaluate some of these methods and dispel or confirm the "hunches" so often used as our basis for choosing one method over another. These future teachers will carry this training, including methodology in teaching, into the classrooms they will occupy as teachers. It is the intent herein, to evaluate a particular method of teaching clothing construction through the use of multi-media.

William H. Allen[1], in his article entitled Instructional Media

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[1]William H. Allen, "Media Stimulus and Types of Learning," Audiovisual Instruction, January, 1967, pp. 27-31.

Stimulus Relationships to Learning Objectives, has developed a learning objective classification. He reports that instructional media types most likely to be used in teaching students to perform skilled perceptual motor acts, would be still pictures (filmstrips), motion pictures, television, 3-D objects, and demonstrations. None of these are rated above medium and most are rated low in effectiveness in learning to perform skilled perceptual motor acts.

The processes of clothing construction would correctly fit in the classification of skilled perceptual motor acts.

Robert M. Gagne[2] has produced a table entitled Instructional Functions of Various Media. He considers the medium "Objects: Demonstration" as being limited in providing a model of expected performance. Still pictures and moving pictures are also limited, while sound movies are rated much better for the purpose.

If one considers the act of constructing clothing, it is doubtful that sound movies would be rated as high. Most sound movies are shown in darkened rooms and students are handicapped in taking notes. If the students take notes, they cannot give their undivided attention to the movie. If the student is to depend on memory, the ability to recall and perform a complex motor act, such as would be required in many clothing construction techniques, would leave much to be desired.

These two authors have considered each medium and its relation to learning objectives and to function, individually, which for their

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[2]Robert M. Gagne, Conditions of Learning, (New York: Holt, Rinehart, and Winston, Inc., 1967), p. 284.

purpose, is quite proper. However, utilization of multiple media should be as a system in order to capitalize on mutual enhancement effects. Certain multi-media combinations may yield learning situations in which performing skilled perceptual motor acts would be improved.

Need for the Study

A review of the literature revealed very little research has been done in the use of media in teaching clothing construction techniques. However, the review of the literature revealed considerable research has been done on media utilization and indicated that methods of teaching via media could provide a better learning situation than teaching without it in many cases. The necessary conditions to bring this about were that the teacher apply learning theories and educational objectives to the use of the media. The need is to look at techniques in teaching clothing construction via media, in this context.

Statement of the Problem

The problem of this study was dual in nature. The first question asked whether Central State University students taking college clothing construction courses, which require performing skilled perceptual motor acts learn as well from the following:

a. specific sewing technique demonstrations presented face to face, or

b. equivalent demonstrations presented via the modified perspective of television?

The second question asked which of the following alternative methods is better for enabling such student to reproduce the technique

being demonstrated:

a. by forewarning the students that complete dependence must be placed on the demonstrations and special effort should be made to memorize and to take adequate notes, or

b. by pre-advising of, and later offering additional illustrative materials which exhibit step-by-step models of the techniques presented in the demonstrations?

Hypotheses

1. Achievement in learning a psychomotor skill, specifically a clothing construction technique, is not significantly different when utilizing face to face demonstration than when using the same demonstration presented via television.

2. Achievement in learning a psychomotor skill, specifically a clothing construction technique, is not significantly different when utilizing illustrative materials as opposed to using student notes taken during the demonstration.

3. Achievement in learning a psychomotor skill, specifically a clothing construction technique, is not significantly different due to the interaction of the various combinations of treatments used in the experiment.

4. Achievement in learning a psychomotor skill, specifically a clothing construction technique, is not significantly different when face to face demonstration is combined with the use of illustrative materials as opposed to being combined with student notes, taken during the demonstration.

5. Achievement in learning a psychomotor skill, specifically

a clothing construction technique, is not significantly different when face to face demonstration is combined with illustrative materials as opposed to televised demonstration when combined with illustrative materials.

6. Achievement in learning a psychomotor skill, specifically a clothing construction technique, is not significantly different when televised demonstration is combined with illustrative materials as opposed to being combined with student notes.

7. Achievement in learning a psychomotor skill, specifically a clothing construction technique, is not significantly different when face to face demonstration is combined with student notes as opposed to televised demonstration being combined with student notes.

Population Defined

The population for this study consisted of the students enrolled in Home Economics 233, "Advanced Clothing Construction", at Central State University, Edmond, Oklahoma, during the fall semester, 1971.

Limitations

1. This study was limited to the previously defined population.

2. This study was limited to the validity and reliability of the evaluation techniques developed and used for measuring student performance.

3. Generalizations from the study were limited to the concepts involving the use of multi-media tested as they pertain to the clothing construction techniques tested.

Controls and Assumptions

The experience of students in sewing background was assumed to be approximately equal since it was a condition for enrollment in an advanced clothing construction course that students have the basic clothing construction course or equivalent. The same instructor presenting the face to face demonstrations prepared the televised demonstrations so demonstration content is reasonably identical except where television can offer the advantage of close-up magnification. New demonstrations were used, hence the students would not have been exposed to them previously. This fact was determined by asking each student about previous experience with the technique being demonstrated. Materials used by the students were the same so "problem fabrics" were not a variable. Sewing machines were similar except that some were zig-zag models while others were straight stitch models. All of the demonstrations employed involved straight stitching only, so the zig-zag machines were set for straight stitch operation.

Definition and Description of Terms

1. Face to face demonstration - Instructor showing group of students in a face to face situation how to use the materials and equipment to attain certain results as they relate to a clothing construction technique.

2. Televised demonstration - Instructor showing group of students via a televised tape recording, how to use the materials and equipment to attain certain results as they relate to a clothing construction technique.

3. Illustrative materials - A set of step-by-step illustra-

tions in actual fabric and necessary materials together with printed instruction pertaining thereto, in such order as to how and when to do each operation to attain certain results; i.e., the same results to be attained from demonstrations previously defined.

4. Achievement of a learning skill - The learner performed the learning task and the product she produced was judged on a 100 point scale by five experienced Home Economics teachers having no knowledge of the learner's identification.

5. Evaluation instrument - Instrument used by judges to evaluate performance of students, which was tested for reliability and validity.

6. Neckline facing - The use of a separate piece of fabric, which when sewn to the neck opening of a garment, serves to provide a neat and durable edge.

7. Invisible zipper - A specially designed zipper requiring a specific technique of application which produces an inconspicuous closure resembling a seam.

8. Bound buttonholes - A method of enhancing the appearance of the buttonhole by using an extra piece of fabric to finish the edges.

9. Covered belt - A method of applying fabric to a stiff belt foundation to produce a neat cloth covering.

Design of the Study and Procedures Followed

This study was designed to determine the effectiveness of using multi-media in teaching methods in clothing construction as measured by student performance evaluated by a group of five judges. Among the independent variables which were controlled and tested for effect on the

dependent variable of student performance, were the method of instruction, the educational level of the students, the sex of the students (all female), the background experience in sewing (basic clothing or equivalent being a prerequisite), fabrics and materials used, and sewing machines used. Independent variables not controlled but randomized to confound their effects included intelligence and assignment of order of tasks performed. To facilitate the execution of this study, the following procedures were effected:

Preparation of Televised Demonstrations and Illustrative Materials

Four techniques of clothing construction were selected which were usually a new learning experience to the students of the advanced clothing classes at Central State University.

The investigator made four clothing construction demonstrations, each showing a technique different from the others; i.e.,

1. how to apply a neckline facing around a lapped zipper application,
2. how to insert an invisible zipper using a regular zipper foot,
3. how to make a bound buttonhole using a Dritz buttonhole maker,
4. how to cover a belt.

Illustrative materials were prepared on each of the above demonstrations which gave a step-by-step instruction of how to perform the tasks. See photograph in Appendix A.

Selection and Assignment of Sample

Students were free to enroll in either of two advanced sections of clothing construction. Both sections were taught by the same instructor, and the course content was identical. The only difference in the sections was the time of meeting. There was no reason to suspect any bias in relation to students choosing one section over the other since such arbitrary choices would be expected to produce random assignments. There were fifteen students enrolled in the first section and sixteen in the second. Each section was first assigned to the demonstration, face to face or televised, by a flip of a coin. Within each section, assignment was made to illustrative materials or student notes by another flip of a coin. After these decisions were made, the students in the first section pulled a number from 1 to 15 from slips of paper in a box, and the students in the second section did the same with numbers from 16 to 31. After this original assignment the students moved through the rest of the experiment in accordance with a specific design established to eliminate the effect of ordering. A model of the experiment follows.

MODEL

	FF Demo.[a]	TV Demo.[b]
I.M.[c]	I	III
S.N.[d]	II	IV

MODEL--Continued

Demonstration #1[e]

	FF Demo.[a]	TV Demo.[b]
I.M.[c]	Students 1 - 7	Students 16 - 24
S.N.[d]	Students 8 - 15	Students 25 - 31

Demonstration #2[f]

	FF Demo.[a]	TV Demo.[b]
I.M.[c]	Students 16 - 24	Students 8 - 15
S.N.[d]	Students 24 - 31	Students 1 - 7

Demonstration #3[g]

	FF Demo.[a]	TV Demo.[b]
I.M.[c]	Students 25 - 31	Students 1 - 7
S.N.[d]	Students 16 - 24	Students 8 - 15

Demonstration #4[h]

	FF Demo.[a]	TV Demo.[b]
I.M.[c]	Students 8 - 15	Students 24 - 31
S.N.[d]	Students 1 - 7	Students 16 - 25

Students	Demo. #1[e]	Demo. #2[f]	Demo. #3[g]	Demo. #4[h]
1 - 7	I	IV	III	II
8 - 15	II	III	IV	I
16 - 24	III	I	II	IV
25 - 31	IV	II	I	III

[a]FF Demo. = face to face demonstration

[b]TV Demo. = televised demonstration

[c]I.M. = illustrative materials

[d]S.N. = student notes

[e]Demo. #1 = neckline facing around lapped zipper application

[f]Demo. #2 = invisible zipper insertion using regular zipper foot

[g]Demo. #3 = bound buttonhole using a Dritz buttonhole maker

[h]Demo. #4 = covering a belt

Procedures

The students in each section were given the opportunity to become acquainted with the types of demonstrations, face to face or televised and with the illustrative materials similar to those to be used in the experiment. A mini demonstration was presented by the investigator and the students reproduced the technique from what they observed and from the illustrative materials associated with the demonstration.

After this initial introduction, students were presented with the demonstrations and illustrative materials in accordance with the model previously explained. Immediately after the demonstrations the students attempted to replicate the product demonstrated. The task was completed in that class period. Each class period was sufficiently long to allow ample time for completion of the project. This procedure was repeated for different demonstrations on four different days for each class.

After completion of all the demonstrations, the products produced by the students were evaluated by the five judges in accordance with the evaluation instrument.

Selection of Judges

All of the judges used in the study were currently or formerly certified Home Economics teachers experienced in teaching and evaluating clothing construction projects of students.

Evaluation Instrument

The evaluation instruments were designed to contain the specific details to be checked by the judges on each of the products produced

by the students. See Appendix B.

Reliability and validity of the instruments were established by having three judges evaluate the work of the students using the evaluation instruments. A Pearson R Correlation was made on the grades assigned by the three judges. The correlations obtained appear as Appendix C.

The correlations obtained were relatively high positive correlations. It was therefore assumed the evaluation instruments could be justifiably used for evaluation of students' work.

Evaluation by Judges

The complete evaluations of the students' work by the five judges appear as Appendix D.

Treatment of the Data

The raw data collected in the experiment are presented in tabular form for each demonstration in Appendix E. The raw data is also presented in tabular form for each teaching method in Appendix F. The statistical significance of this data was evaluated by a two-way analysis of variance, using a finite fixed model, to determine if the results of the teaching methods differed significantly at the .05 level of probability and to test for interaction between the combinations of variables (see page 10 for explanation of abbreviations), i.e.

FF Demo. versus TV Demo.

I.M. versus S.N.

Interactions within any of the combinations

FF Demo. + I.M. versus TV Demo. + I.M.

FF Demo. + I.M. versus FF Demo. + S.N.

TV Demo. + I.M. versus TV Demo. + S.N.

FF Demo. + S.N. versus TV Demo. + S.N.

Organization of the Study

The report of this study was organized into five chapters. The first chapter was a description of the study including background introduction, need for the study and statement of the problem. It also included the hypotheses, limitations, definitions and descriptions of terms, design of the study and procedures followed, and treatment of the data.

Chapter II consisted of a review of selected research studies which pertained to this study. Chapter III contained the procedures used in setting up the experiment and collecting the data. Chapter IV contained the treatment and analysis of data. Chapter V contained the summary of the study, conclusions resulting from the findings, recommendations based on the findings and suggestions for further research.

CHAPTER II

A REVIEW OF SELECTED LITERATURE

This study involved several facets of education. The key variables were instructional television, face-to-face demonstration, illustrative materials, and note taking by students. The study involved several clothing construction tasks taught in a Home Economics course for students at the college level. This review, therefore, will deal only with the facets which relate to this particular study.

The encompassing areas in this review, ranging from the general to the particular are: instructional systems and multi-media, television, televised instruction versus face-to-face instruction, psychomotor skills and demonstrations, and note taking and illustrative materials.

Instructional Systems and Multi-media

Instructional Systems

If educators are to use educational media to their fullest advantage, they need to think in terms of a system of teaching in which materials become an integral part of the system rather than using separate types of media such as films, tape recordings, or programmed instruction in isolation.

Brown, Lewis, and Harcleroad[1] define such a system as the planned, validated selection of media, methods, equipment, facilities, and people used in performing activities required to achieve the objectives of instruction, and incorporating within itself the capability of providing continuous self-correction and improvement. Although a systems approach is concerned with all the elements of instruction, the result, "learning," remains as the central purpose. The teacher's proper role is more than a presenter of information. Rather, it is as manager of the totality of learning activities. In planning an instructional system, the teacher must start with clear goals stated in operational and measurable terms. The next step is to select the methods and tools required to achieve the learning goals.

Most systems would involve several of the media; therefore, their application and possible interactions will next be reviewed.

Multi-media

Good teachers have, for generations, used a variety of media in the classroom. However, media used in a system of instruction suggests the idea of multi-media. As previously stated, one needs to start with a specific set of objectives and design the system in order to attain a specific goal through the best medium or media available. The components should be integrated to reinforce each other in a fashion that will produce a whole greater than the sum of its parts. According

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[1] James W. Brown, Richard B. Lewis and Fred F. Harcleroad, AV Instruction Media and Methods, Third Edition (New York: McGraw-Hill Book Company, 1969) pp. 504-5.

to Hoban[2], research indicates that media can be complementary rather than competitive and that a combination of media in the instructional processes is superior to any one alone.

Many authorities in the field of educational media point to the need for research to determine the optimal utilization of combinations of media.

Greenhill[3], in enumerating trends and need for future research, indicates that content decisions will need to be followed by decisions on the appropriate method of presenting the content. It would be well to consider a variety of learning situations and combinations of media. In addition to the main materials and methods, thought should be given to the development of appropriate supplemental materials and learning opportunities. These kinds of activities would lend themselves to being tested empirically and would be a considerable improvement over the hit-and-miss method of preparing courses and testing students. Most of the studies conducted previously were single variable comparisons which usually yielded non-significant differences. We need to know what combinations produce positive results and which produce negative results and to know if important interactions exist.

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[2]Charles F. Hoban, Jr., "Research in New Media in Education," Three Conference Working Papers (Washington, D.C., American Association of Colleges for Teacher Education, 1961), pp. 22-3, quoted by E. Dale, Audiovisual Methods in Teaching, Third Edition (New York: The Dryden Press, 1969), p. 157.

[3]Leslie P. Greenhill, "Research on Instructional Television and Future" in Teaching by Television, edited by Barton I. Griffith and Donald W. MacLennan (Columbia, Missouri: University of Missouri Press, 1964), pp. 20-1.

Carpenter[4], in his article about promising areas of research, speaks of the need for research in combinations of media. He asks, for example, whether the characteristics and potentials of other media can be mediated completely by television and what are the characteristics of television which, when imposed on other media, reduce or increase their effects on learning. The objective of research on combinations of media would be to determine the characteristics of models and patterns or combinations of media for use in different types of teaching-learning situations for different kinds of context.

A sampling of some studies which have explored combinations of media are as follows:

Huffman[5], in 1959, conducted a study with eighth grade students. He compared lecture-description and lecture-film, each with lecture-film-demonstration. He found no significant difference between any of the treatment groups for any of the three testings.

LeMaster[6], in 1962, worked with junior high school boys. He compared instructor's demonstration alone with the instructor's

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[4]C. R. Carpenter, New Teaching Aids for the American Classroom (Report prepared and published by the Institute for Communication Research, Stanford University, Stanford, California, 1960), pp. 85-9.

[5]Stanley Ausburn Huffman, Jr., "A Comparative Analysis of Four Instructional Methods in Eighth Grade Science," Research in Instructional Television and Film (Washington, D.C., U.S. Department of Health, Education and Welfare Report, 1967), p. 92.

[6]Lelan Kenneth LeMaster, "Filmed Demonstrations with Manual Class Demonstrations vs. Conventional Demonstrations in Introductory Woodwork," Research in Instructional Television and Film (Washington, D.C., U.S. Department of Health, Education and Welfare Report, 1967), p. 116

demonstration in combination with film demonstration. He concluded that the use of film increased learning and helped students to use manipulative skills more effectively.

Askins[7], in 1967, worked with Air Force personnel. He compared lecture-demonstration with programmed textbook instruction, both independently and in combination. Results showed a significant increase in learning when the lecture-demonstration and programmed textbook were used in combination, as opposed to being used independently.

Gross[8] conducted a study in 1968 to assess the effectiveness of three different types of study guide materials given to teachers whose classes watched televised music lessons. One study guide provided a description of the program content plus suggested activities; another provided only a description of the program content; the third provided the program titles and dates but no study help. The study guide which provided a description of the program content plus suggested activities was clearly superior.

Herr[9], in 1970, conducted a study assessing illustrated and

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[7]Billy Earl Askins, The Effectiveness of Two Different Uses of an Autoinstructional Program to Teach the Use of the Air Force Fiscal Account Structure and Codes, North Texas State University, Denton, Texas, Ed.D. Thesis, 1967. Abstract published in Research in Education (Washington D.C., Educational Resources Information Center, Vol. 4, No. 7, July, 1969), ERIC Doc. ED 026601.

[8]Lynne Schafer Gross, An Assessment of the Effectiveness of Teacher Study Guides Used in Conjunction with Educational Television Lessons, School of Ed., California Univ., Berkley, Calif. Thesis, 1968. Abstract published in Research in Education (Washington D.C., Ed. Resources Info. Center, Vol. 5, Sept., 1970), ERIC Doc. ED 040593.

[9]James F. Herr, Illustrated Instruction Sheets as Supplement to Teaching Manipulative Operations in Graphic Arts Via Video Taped Closed-Circuit Television, Univ. of Missouri, Columbia, Missouri, Ed.D. Thesis, 1970. Abstract published in Research in Education (Washington, D.C., Ed. Resources Info. Center, Vol. 5, Sept., 1970), ERIC Doc. ED 041133.

non-illustrated procedure sheets to supplement closed-circuit television and one instructor, in Industrial Arts. The results showed the illustrated procedure sheets were significantly superior with regard to manipulative performance.

Russell[10], in 1970, compared effects of seven verbal-visual presentation modes upon teaching the component learning tasks of concept learning, classification, generalizations and application. The results showed no superior presentation mode across the three learning objectives. However, some of the results implied that where specific types of learning can be identified, particular presentation modes will produce superior learning effectiveness.

The above cited studies are only illustrative of the kinds of studies which have been conducted and do not represent a complete summary of combinations of media research.

Television

In order to get a proper perspective, it is necessary to take a look at both commercial and educational television. Commercial television comprises the bulk of programming, usually sponsored, which is most often viewed in the home. Educational television may be categorized into community educational television for home and school and instructional television (direct formal instruction) meant to describe the applications of television in formal courses. Instructional television may be distributed on either open educational television channels or

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[10]Josiah Johnson Russell, IV, Comparitive Effects of Seven Verbal Visual Presentation Modes upon Learning Tasks, University of Southern California, Los Angeles, California, Thesis, 1970.

closed-circuit systems. Further categorization of instructional television can be made in that the instructional programs may be created by professional television producers and television teachers or by the classroom teacher who may directly video-tape material for his or her own particular use with and for students. It is this latter type of television which was utilized in this study.

Television research flourished in the late 1950's and early 1960's. During that period there were many government and foundation grants available for instructional television because it apparently held so much promise for education.

The summaries of research on instructional television are many. Meaney[11], notes that television probably is the most extensively tested instructional device ever offered to education. The development of television and the research programs which resulted have pointed to the fact that we have amazingly little good research on other and much older instructional devices. According to Meaney there has been far too little good research into the basic elements and methods of instruction.

Brown[12], summarized the research in evaluating instructional television projects in the New York metropolitan area up to 1964. He found "the overwhelming majority (almost 90%) of gross comparisons between television and conventional communication conditions show no

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[11]John W. Meaney, Televised College Courses (Report from the Fund for the Advancement of Education, 477 Madison Avenue, New York 22, N.Y., 1962), p 31.

[12]Roscoe C. Brown Jr., "Evaluation of Instructional Television" in A Guide to Instructional Television, edited by Robert M. Diamond (New York: McGraw-Hill Book Company, 1964), Chapter 15.

substantial difference in achievement or information gain." This report dealt with all classes of television available at that time.

Carpenter[13], reviewed the research and reported that teaching by television can be effective and can be done in a great variety of ways. Research on the effects on learning when teaching by television as compared to a wide range of comparable conventional arrangements, generally revealed no statistical difference.

The summaries cited in this section were essentially concerned with the question as to whether or not television instruction could effectively teach. They made little explicit comparison of the relative effectiveness of televised instruction and face-to-face instruction.

Televised Instruction Versus Face-to-face Instruction

The following reports particularly dealt with a comparison of televised instruction and face-to-face instruction.

Greenhill[14], reported in 1964 that the use of television for the presentation of regular classroom instruction was just ten years old and in that short time, instructional television was probably subjected to more research than any other instructional innovation. He said there were a number of excellent summaries such as Kumata's in 1956, Holme's in 1959, Schramm's in 1962, MacLennan's and Reid's in 1963, and Stickell's in 1963. Most of these surveys point out that some groups of

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[13]C. R. Carpenter, New Teaching Aids for the American Classroom (Report prepared and published by the Institute for Communication Research, Stanford University, Stanford, California, 1960), p. 80.

[14]Leslie P. Greenhill, "Research on Instructional Television Past and Future" in Teaching by Television, edited by Barton I. Griffith and Donald W. MacLennan (Columbia, Missouri: University of Missouri, 1964), pp. 20-1.

students learned more from televised instruction than from direct instruction, a smaller number learned less but in the majority of cases there were no significant differences in learning.

Stickell[15], accounted for the variation in results as a function of inadequate experimental designs and uncontrolled variables. Of the 250 studies he examined he classified 217 as "uninterpretable", 23 as "partially interpretable" and only 10 were classified as "interpretable". All of the 10 "interpretable" studies showed no significant difference at the .05 level, in learning, between face-to-face and television instruction.

Greenhill[16], continued his discussion by suggesting that some of the inconsistencies reported might be obtained if television instruction favored some kinds of subject matter or grade levels and face-to-face instruction favored other grade levels and subjects.

Gordon[17], reasoned that there is a variation in the effectiveness of television teaching in relation to grade level and subject matter. The subject matter areas of mathematics, science and social studies (excluding history) appear to show the most success.

A study which lends support to this conjecture was conducted

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[15]David White Stickell, A Critical Review of the Methodology and Results of Research Comparing Televised and Face-to-face Instruction, The Pennsylvania State University, University Park, Pennsylvania, Ed.D. Dissertation, 1963, quoted by Leslie Greenhill, "Research on Instructional Television Past and Future" in Teaching by Television (Columbia, Missouri: University of Missouri, 1964), pp. 20-1.

[16]Greenhill, loc. cit.

[17]George N. Gordon, Educational Television (New York: The Center for Applied Research in Education, Ind., 1965), p. 85.

in 1969 by McVay[18] at Shoreline Community College, entitled "Video-taped Instruction for the Teaching of Skills." The major goal of this study was to assess the value of video-taped instruction for the teaching of special skills as compared with conventional methods of teaching these skills. Five different subject areas were studied in relation to this goal. The five areas were business, chemistry, electronics, English, and nursing. He found that while there was no significant difference between video-taped instruction compared with conventional methods, there was a significant difference in achievement that was limited to some subject areas and not in others. The rationale was that, even though all were teaching skills which involve a manipulative physical response, one group of subject areas utilized more psychomotor skills and the other more cognitive skills.

Since the subject of this study deals with the teaching of clothing construction techniques, the literature was surveyed for research in this area.

Meacham[19] conducted a research project entitled "Television in the Clothing Classroom" in 1963. She recognized, that although television had been used as a teaching tool in the college classroom for more than a decade, there were relatively few situations where the use of educational television could be found in the Home Economics classroom. She reasoned, that it was partially due to television being

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[18]Donald R. McVay, Video-taped Instruction for the Teaching of Skills, Shoreline Community College, Seattle, Washington, Project Report to Washington State Community College System, July 17, 1969.

[19]Esther Meacham, "Television in the Clothing Classroom" in Journal of Home Economics, Vol. 56, No. 2, February, 1964, pp. 89-94.

considered most effective for reaching large audiences, and enrollment in Home Economics was usually a small segment of the campus enrollment. She added, that it had been proved over and over that similar learning can take place either through television or through conventional teaching. There remains then, the need for research utilizing television in the areas of promoting overall objectives of the course, motivating students to the self activity in developing critical standards, analyzing and solving problems, and in applying principles, as well as acquiring factual information.

Meacham's study investigated many of the facets of education cited above. Her results, using six different tests, showed no significant difference in achievement of control and experimental groups except in achievement on laboratory performance which favored the experimental group. Her study made no attempt to make the instruction for the two groups identical although the two groups did have the same instructor. An attempt was made to maximize the use of the characteristics inherent in television.

Meacham's study, as well as McVay's, points to still another possible reason for inconsistencies in the results of research; the type of learning to be achieved may be an important factor. The laboratory performance would require the use of more psychomotor skills and the acquisition of factual information and problem solving would require the use of more cognitive skills.

Psychomotor Skills and Demonstrations

The teaching of psychomotor skills can be found in areas such as the medical and dental fields and the creative arts which includes

Home Economics.

The literature is rich with reference describing the teaching of psychomotor skills which usually requires the use of the demonstration. These references are highly relevant because the tasks performed by the students in this study were those primarily involving psychomotor skills. When an educator wishes to instruct students so that efficient learning of a psychomotor skill can result from a demonstration, he needs to consider the nature of learning to perform psychomotor skills and the characteristics of demonstrations.

Hatcher and Andrews[20], in their textbook, indicate that learning clothing construction techniques involves the use of motor skills. The teacher's responsibility is to direct the students attention to the essential features of the skills to be learned and to guide them in a way that results in saving time and effort in learning. This can be done by use of the demonstration technique which generally involves the presentation of procedures or processes to be learned, and an actual showing of how a process can be accomplished. This technique often leads to more effective learning than the use of written or verbal instructions which can be vague and subject to misinterpretation. In addition, the demonstration can also exemplify the high standards expected when the process is properly recreated by the student.

Dale[21], defines a demonstration as an audiovisual explanation,

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[20]Hazel M. Hatcher and Mildred E. Andrews, The Teaching of Home Economics (Boston: Houghton Mifflin Company, 1963), pp. 117-9.

[21]Edgar Dale, Audiovisual Methods in Teaching, Third Edition (New York: The Dryden Press, 1969), p. 272.

which can be used for conveying information, for developing skills or for promoting certain attitudes. Put more simply, a demonstration is for "understanding", "how", and "why". When demonstrating a motor skill the "how" is emphasized, because we need an actual description of performance requirements. He says that in teaching a skill, a demonstration through a guided performance is a virtual necessity. An effective demonstration is a triple involvement of audience, demonstrator and explanatory material.

There are many descriptions in the literature of the details with which one must be concerned when creating and presenting an effective demonstration. As many of these suggestions were followed as possible, in creating and in presenting the demonstrations used in this study. Since each pair member used in the study was identical, no discussion of many of the details was made because of their common effects. However, for those details which were judged to be sensitive to the medium used in presenting the demonstration, face-to-face as opposed to television, an explicit examination was made and discussed.

In the textbook by Dale[22], and another by Brown, Lewis and Harcleroad[23], there are lists of features and principles which would be affected by the medium and which have direct implications for this study.

Probably the most important principle is that of making certain that everyone can adequately see and hear. It would not be logical to

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[22]Ibid, 275-287.

[23]James W. Brown, Richard B. Lewis and Fred F. Harcleroad, AV Instruction Media and Methods, Third Edition (New York: McGraw-Hill Book Company, 1969), p. 486-8.

expect a student to learn much from a demonstration he cannot sense. The adequate accomplishment of this principle depends on several things. First would be the size of the objects and the intricacy of the procedure being viewed. When small scale objects and fine manipulations are presented, as is the case in clothing construction techniques, a face-to-face demonstration can be viewed by a very limited number of students. The advantage of television and its attendant magnification capability would be considered an improvement. This view is supported to a degree by Richter[24]. As a result of his experience instructing in a college anatomy laboratory, he says there is a strong indication that television as an image magnifier will result in significantly greater achievement on the part of the low-ability student (high-ability students do well regardless of mode of instruction), provided he can actively manipulate materials similar to those shown on the screen.

Gordon[25], claims that television is similar to the motion picture in its ability to show tiny procedures at close range, thereby providing every student a "front row seat".

Another feature worthy of consideration is the position from which the student views the demonstration. Chu and Schramm[26], in their summary of television research say that when learning a perceptual motor

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[24]Robert D. Richter, "Television in the Anatomy Laboratory" in A Guide to Instructional Television, edited by Robert M. Diamond (New York: McGraw-Hill Book Company, 1964), Chapter 2.

[25]George N. Gordon, Classroom Television (New York: Hastings House, Publishers, 1970), p. 106.

[26]Goodwin G. Chu and Wilbur Schramm, "Learning from Television: What the Research Says", Volume 1 of To Improve Learning, edited by Sidney G. Tickton (2 Vols.; New York: R. R. Bowker Company, 1970), p. 180.

skill, a subjective angle presentation tends to be more effective than an objective angle presentation.

Coleman[27], whose report concerns the utilization of television in teaching art, reports the advantage of "first person view" of the work obtained by using the camera over the shoulder of the demonstrator. The methods used thus become, in a real sense, a part of the viewer's experience.

Dale[28], indicates there is evidence that many demonstrations of skills are most effective when they are presented from the same aspect as that of the learner. In particular, it is important that left and right hand relationships correspond to the way he sees them as he repeats the demonstrated skills.

In a face-to-face demonstration, the demonstrator would have to have his back to the audience in order to bring this about. In many situations he would block the view of the audience if he attempted to preserve the right-left relationships, to the learner. This difficulty is evident in the example of using a sewing machine during a demonstration. A camera, on the other hand, can be placed "over the shoulder" of the demonstrator so the view seen by the audience is in the preferred viewing position. Dale[29], calls this a "zero angle" shot.

Another feature, that of establishing rapport with the audience,

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[27]Robert R. Coleman, "Television in the Art Class" in A Guide to Instructional Television, edited by Robert M. Diamond (New York: McGraw-Hill Book Company, 1964), Chapter 2.

[28]Edgar Dale, Audiovisual Methods in Teaching, Third Edition (New York: The Dryden Press, 1969), p. 285.

[29]Ibid.

according to Dale is a necessity for good communication. He defined it as the sharing of ideas and feelings in a mood of mutuality. The salesman's axiom is that unless he holds the interest of the customer, he may lose the sale. Likewise, the teacher who neglects the needs and interest of students may not promote the learning that the demonstration is meant to foster. This seems to imply that establishing rapport with some students may be better accomplished with a face-to-face demonstration than with a televised demonstration.

Costello and Gordon[30], view the question of face-to-face contacts as follows: for the purposes of motivation, encouragement and rapport, especially in elementary education, a pat on the back or a wink may sometimes have more power than textbooks, visual aids or lesson plans. Television transmits some of the human qualities of its instructors but not all. These same authors also say that the college student can observe on television every nuance of his instructor's gestures of face and body, and watch the instructor address every remark and parenthetical observation to him. Could he feel any less personally involved than with the same teacher in a lecture hall seating 200?

The foregoing discussion on the use of the demonstration method to teach the development of a psychomotor skill led to the rationale for this study. The information contained therein suggests that the demonstration would probably promote better learning when presented by television than in a face-to-face presentation.

There is evidence, however, that learning derived from the

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[30]Lawrence F. Costello and George N. Gordon, Teach with Television (New York, Communications Arts Books, Hastings House Publishers, 1961), p. 28.

demonstration can be improved upon.

Student Note Taking and Illustrative Materials

In an effort to provide the best learning conditions for the student who observes the demonstration of a psychomotor skill, one must also consider the aspects of practice and redundancy.

Hoban[31], reports that research indicates that students learn "what they do", which can also be referred to as "practice". He further reports that there is much support for redundancy as one of the fundamental means of communicating information and it is a most generally effective determinant of learning. Film research indicates that each repetition in its many forms such as repetition of whole films, scenes and sequences, illustrative examples, film strips, review and discussion, have all resulted in increments of learning.

This repetition serves as a bridge between the process being demonstrated and the performance of the student in duplicating the process. The repetition can also be thought of as a form of reference material which can be provided in many ways. One of the most common ways a student gets his reference material, for duplicating the process in question, is by taking notes. This had been discussed by the several authors which are cited below:

Brown, Lewis and Harcleroad[32], report that the following

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[31]Charles F. Hoban, "The Usable Residue of Educational Film Research" in New Teaching Aids for the American Classroom. The Institute for Communications Research, Stanford, California, 1960, pp 106-7.

[32]James W. Brown, Richard B. Lewis and Fred F. Harcleroad, AV Instruction Media and Methods, Third Edition (New York: McGraw-Hill Book Company, 1969), p. 286.

generalizations can be drawn from research about film use. Note taking during the average film showing interferes with attention and hence with learning.

Dale[33], in his discussion of educational television and note taking, says the hazard is that writing will be distracting and shift the attention away from the screen.

It would seem logical from the foregoing comments that note taking does not produce the best learning condition. The instructor should therefore provide some alternative. Several authors have made the following suggestions:

Brown, Lewis and Harcleroad[34] , conclude that research indicates that learning improves if printed study guides are used. They also maintain that stopping films periodically for questions and note taking is found to contribute to learning.

Dale[35], in his discussion on television, suggests that the instructor make available an outline of the televised content and discuss it before the telecast.

Hatcher and Andrews[36], report that copies of directions for doing the process, especially when step-by-step procedures are involved, are desirable for the students for reference.

The foregoing recommendations for providing the necessary

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[33]Edgar Dale, Audiovisual Methods in Teaching, Third Edition (New York: The Dryden Press, 1969), p. 371.

[34]Brown, Lewis and Harcleroad, loc. cit.

[35]Dale, loc. cit.

[36]Hazel M. Hatcher and Mildred E. Andrews, The Teaching of Home Economics (Boston: Houghton Mifflin Company, 1963), pp. 117-9.

reference materials raised the question of whether or not a better method could be devised. Therefore, "illustrative materials" were utilized as a variable in the study and were compared with the common method of note taking.

Illustrative materials would be included in the general heading of realia. Brown, Lewis and Harcleroad[37] report that the more closely a learning experience approximates the conditions under which a student is expected to perform, exhibiting what he has learned, the more permanent that learning will be. Therefore, realia, natural or man-made models, are desirable resources for instruction.

The illustrative materials used in this study were in a somewhat different form than that of most realia used in education. The form used was a model or models, made of normal materials, but with the modification of having been produced in a series of steps. The steps corresponded to various stages of a demonstration, and also depicted the evolution of a product as it was to have been fabricated by the student.

Hatcher and Andrews[38], report the equipment used in the demonstration should be similar in kind and size as the students will be using in the learning process. Not only were the illustrative materials which were used in the study, similar in kind, but they went even further in that they provided the step-by-step process.

A study by Blancheri and Merrill[39], in 1963, involved the

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[37]Brown, Lewis and Harcleroad, loc. cit.

[38]Hatcher and Andrews, loc. cit.

[39]Raymond L. Blancheri and Irving R. Merrill, "The Step Presentation of Dental Technic Instruction" in Research in Instructional Television and Film (Washington, D.C., U.S. Department of Health, Education and Welfare Report, 1967), p. 33.

relative effectiveness of teaching a dental technique by instructional television using one large step as compared to several smaller steps. There was a significant difference in the time required to perform the technique but not in the quality of the work of the two groups. The step-by-step group completed the task in much less time than the group using the one large step.

Fitts[40], has done considerable work with skill training in the armed forces. He deals with task taxonomy and recognizes two somewhat contrasting approaches to the analysis of skill: (a) the typical individual difference approach and (b) the variation of independent characteristics of a skill task approach. These approaches differ from each other but also complement each other in revealing important dimensions of tasks and dimensions of individual differences. He points to still another approach to the understanding of the nature of skill and of skill training problems by the use of survey techniques, tapping the experiences of men and women who devote their lives to the training of people in various skills.

He says that most instructors believe that an important aspect of skill learning is the development of an understanding of the nature of the task. This factor is most important early in training. Most instructors emphasize the importance of perceptual factors in skill learning. The student must learn what to look for, how to identify important cues, and how to make critical discriminations. They propose that complex skill learning can be viewed as the acquisition of skill in

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[40]Paul M. Fitts, "Factors in Complex Skill Training" in Training Research and Education, edited by Robert Glaser (Pittsburgh: University of Pittsburgh Press, 1963), Chapter 6.

a number of semi-independent routines or sub-routines which may go on successively or concurrently.

Gagne[41], delivered a paper before a seminar on recent scientific developments sponsored by the American Association of School Administrators. He reported that research indicates that repetition or practice is not the major factor in learning. It is instead the prior learning of prerequisite capabilities, also called specific readiness for learning, or enabling conditions. If one wants to ensure that a student can learn some specific new activity, the very best guarantee is to be sure that he has previously learned the prerequisite capabilities. When this in fact has been accomplished, it seem quite likely that he will learn the new skill without repetition.

Summary

In view of the foregoing, the following rationale was used for the research project reported herein. In demonstrating clothing construction techniques, television should be as good as, and probably better than face-to-face methods. However, the medium of the demonstration is not the primary problem of instruction. The complexity of the psychomotor learning skill, is instead, the problem. Many teachers expect the student to repeat the process being demonstrated either from memory or from notes, neither of which may be adequate for the task. The techniques demonstrated are often too complex for the student to do while the demonstration is in progress. The illustrative materials

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[41]Robert M. Gagne, Some New Views of Learning and Instruction, Phi Delta Kappan, May, 1970, pp. 468-72.

combined with the demonstration eliminates the need for note taking and at the same time provides the prerequisite capabilities to move from one step to the next in semi-independent routines for completing the complex task. Together, the demonstration (face-to-face or via television) and illustrative materials should be complementary.

CHAPTER III

PROCEDURES FOR THE EXPERIMENT

The detailed procedures which were established and followed in the experiment included the selection of personnel, terminal objectives, selection of media to be used to communicate the message, preparation of the materials to be used, i.e., face-to-face demonstrations, televised demonstrations, and illustrative materials. They also included the procedures for assigning tasks to the student, selection of judges and instructions to judges, construction and validation of evaluation instruments, and procedures for collecting and analyzing the data.

Investigator

The investigator, who was also the instructor of the Advanced Clothing Construction course, Home Economics 233, Fall 1971, Central State University, prepared and presented all the materials used in the experiment. This insured, as well as possible, no variability in the instruction given in one class as compared with that given in the other and no variability in the instruction given in the face to face demonstrations as compared with the televised demonstrations.

Terminal Behaviors

The investigator selected certain student terminal behaviors

associated with proper performance of the skills to be learned in the experiment. The terminal behaviors formulated were:

a. the ability to apply a neckline facing around a lapped zipper application

b. the ability to insert an invisible zipper using a regular zipper foot

c. the ability to make two identical bound buttonholes using a Dritz buttonhole maker

d. the ability to cover a belt (sample size five inches long).

Communication System

A treatise on teaching psychomotor skills by Paul M. Fitts[1] was used as a guide for selecting the method of communication to be used in the experiment; i.e., an important aspect of skill learning is the development of an understanding of the nature of the task; also that complex skill learning can be viewed as the acquisition of skill in a number of semi-independent routines or sub-routines which may go on successively or concurrently.

In view of the foregoing remarks, it was decided to develop a media system which would first present a detailed demonstration of how to accomplish a specific task and then follow this by sets of models arranged in a number of semi-independent or sub-routines depicting the task to be performed, which followed the same progression as the demonstration.

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[1]Paul M. Fitts, "Factors in Complex Skill Training" in Training Research and Education. ed. by Robert Glaser (Pittsburgh: University of Pittsburgh Press, 1963), Chapter 6.

Demonstration Preparation

The investigator developed the detailed outline of the steps and routines considered necessary in the process of performing the following tasks:

a. The neckline facing (see page 102 for photograph) was constructed in the following manner. The bodice and facing shoulder seams were closed and the facing finished on the outside edge. The facing was then pinned to the neckline of the bodice with right sides together. The right hand side of the facing was turned back 1-1/8 inches, from the back seam of the bodice, and the left hand side was turned back 1/2 inch from the back seam. The right hand side turnback was trimmed to 1/2 inch. The facing was then sewn to the bodice neckline. The seam was pressed open, and then graded (trimmed) except for the part of the seam which extended beyond where the facing was turned back on the right hand side. This part of the seam was left intact. The seam was then understitched except for the first 1/2 inch beyond the end of the facing on the right hand side. The center back seam was basted in preparation for applying the zipper. The neckline seam which was left intact was turned down along the 5/8 inch seam line and caught in the basting of the center back seam. The demonstrator did not include the act of putting the zipper in the bodice as part of the instruction since the students already knew how to accomplish this task. The demonstrator had already prepared a bodice with the zipper inserted. The demonstrator then proceeded to trim the zipper tape even with the neckline seam. This was followed by the facing being turned down in position and sewn by hand to finish the technique.

b. The invisible zipper application (see page 102 for photograph) used a regular zipper foot and was accomplished in the following steps. The seam was partially closed so that the part remaining open was approximately 1-1/2 inches shorter than the metal chain of the zipper. This was to be the finished length of the placket opening. The placket was basted at 3/4 inches from the seam edge. The basted seam was not pressed open. The invisible zipper was opened and pinned in place with the metal teeth of one side aligned, on the open seam, with the basting stitches. It made no difference whether one started on the right hand side or the left. With the regular zipper foot positioned so that it rode next to the teeth of the zipper, the machine needle was positioned so that the stitching would be lined up exactly with the regular stitching which closed the seam below the placket. The metal teeth of the zipper needed to be standing upright, as opposed to lying down flat as they were when the zipper was closed, when the stitching was accomplished. The second side of the zipper was aligned and stitched in like manner. Basting was removed and the zipper pull was pushed up through the opening left at the bottom of the zipper. The bottom of the zipper tape that was left unattached was sewn on each side to the seam allowance only.

c. The bound buttonholes (see page 103 for photograph) were made in the following manner. The buttonhole positions were marked in accordance with the pattern. A row of machine basting was placed down the front of the garment on each end of the buttonholes. Another row was placed crosswise at what was to be the center of the buttonholes. A 2-1/2 inch patch of fabric was cut for each buttonhole. A patch was

placed in the Dritz tool and positioned over the guidelines on the right side of the garment. The patch was turned first to one side and stitched through the patch and the garment between the lengthwise guide lines. The patch was then turned in the opposite direction and stitched in a like manner. The work was removed from the machine and the Dritz tool removed from the work. The patch was then cut in two pieces through the center of the two rows of stitching. Holding the patch open with one hand the work was turned to the wrong side and a cut was made through the garment under the center of the patch. The cut was made diagonally to each corner. These cuts formed small triangles on each end of the buttonhole. The patch was pulled through to the wrong side of the garment, through the cut just made. The lips of the buttonhole were pulled even and square at the corners. Working from the wrong side of the garment, the fabric was folded back along one lengthwise guideline exposing the triangle lying on top of the end of the patch. The triangle and patch were stitched with very tiny stitches, several times, as close to the lengthwise fold as possible. The triangle on the other end of the buttonhole was stitched in like manner. The buttonhole was pressed using four straight pins, one in each corner to insure square corners. The steaming iron was held over the buttonhole from the right side, never touching the iron to the fabric. When well steamed, the iron was removed and the buttonhole was finger pressed.

d. The belt (see page 103 for photograph) was covered in the following steps. The belting was cut to the proper measurement and the fabric was cut 2 inches longer than the belting, along the selvage, and 2-1/2 times as wide as the belting. A piece of paper was cut as wide as

the belting and about 3 inches long. The paper was folded in half lengthwise and cut diagonally on one end, which when unfolded, formed a point. This paper was used as a pattern for cutting the point on the belting which was too stiff to fold. The belting was placed with the lengthwise edge aligned with the selvage and the point about 1/2 inch from the end of, and on the wrong side of the fabric. This was held in position and stitched through the center of the belting and also through the fabric from the point end to the opposite end. The belt was stitched again from the point end along the lower edge (away from the selvage) as close to the edge as possible. The fabric was then folded back along that row of stitching with the right sides of the fabric together. The point was closed by stitching across the point in the form of an X, using very tiny stitches and stitching right next to the belting, not through it. The seam was trimmed across the point to 1/8 inch. The fabric was turned to the right side over the belting. The excess fabric was tucked under the selvage edge, and pinned in place. It was stitched by machine around the belt, through the belting in one continuous operation starting from the end opposite the point and returning to that end at completion of the stitching. The stitching was through the belting covered by fabric, and about 1/16 inch from the edge.

All four of these demonstrations were recorded on a video tape recorder using a 1/2 inch video tape recorder system. The equipment used was a General Electric Monitor VTR 410 CWD, 17 inch screen; General Electric Video Recorder Model 4TD1B1; and General Electric Television Camera Model 4TE25A1A.

The video recording was accomplished by using an easel for the

printed introductory and summary visuals, and the sewing machine for performing the demonstration. The sound of the demonstrator's voice was recorded concurrently with the demonstration and as the sound track on the video tape. This method of operation allowed for good close-up magnification of the work being performed.

These same demonstrations were presented in a face to face situation in the exact manner they were done for televising.

Illustrative Materials

Each of the four demonstrations previously described was also developed in a step-by-step manner and placed in a folder which the student could use for reference, or take to her sewing machine for copying. Each step appeared in a fabric model and the accompanying narration which described the step was typed. Both the fabric model and the typed narration were attached in the same folder. Each demonstration utilized a number of folders, which were numbered in sequence, sufficient to accomplish the task. These folders were as nearly identical to the demonstrations as was possible within the limitations of the medium used. There were no inconsistencies in instruction between the demonstrations and the illustrative materials.

Preparation of Materials for Student Use

Inasmuch as so many factors can affect performance of students when constructing a garment, it was determined that as much control as possible would be exercised. As already described, all students would do the same tasks. All tasks were new to each student. Sewing machines were as nearly alike as possible. Still another variable might be the

fabrics used. Therefore, all the materials to be used in the experiment were purchased by the investigator so each student had the same type of fabric, zippers, belting, thread, and buttonhole maker with which to work.

The materials provided were cut to size where appropriate and assembled in a package for each student. Each student had exactly what she needed in materials to accomplish the task.

The neckline facings, the bodice sample (partial bodice) and a 7 inch zipper were provided for completion of the first task.

For the second task, two pieces of fabric were cut about 6 x 12 inches and an invisible zipper was provided.

For the third task, three pieces of fabric, one about 4 x 5 inches and two about 3 inches square, were provided along with a Dritz buttonhole maker.

For the fourth task, pieces of belting about 6 inches long and about 1 inch wide were provided along with fabric pieces cut along the selvage about 8 inches long and three inches wide.

With all the tasks, appropriate thread was provided. Each student had her own ruler, scissors, and other necessary sewing equipment to complete the task.

The materials for each task were distributed immediately following each demonstration.

Student Assignment

The two sections of Advanced Clothing Construction were identical except for time when they met. One section met Monday and Wednesday, the other section met Tuesday and Thursday. Each section was

assigned to the method of demonstration to be used the first time by the flip of a coin. Within each section the students were assigned to additional methods by the flip of a coin. For example, students 1 through 7 had access to the illustrative materials after the demonstration and students 8 through 15 had to depend on their notes taken during the demonstration and did not have access to the illustrative materials. In the second section, students 16 through 24 had access to the illustrative materials and students 25 through 31 had to depend upon their notes taken during the demonstration and did not have access to the illustrative materials. After this determination, each student drew a slip of paper from a box, on which was written a number. For section one, it was a number from 1 through 15 and for section two it was a number from 16 through 31. Students drew the numbers in random order, that is they just came to the box without being lined up alphabetically or ordered in any other way. The number the student drew was retained throughout the experiment. All of the work that she performed carried that number. The number was the only means of identification on the work. The students did record their name and number for future reference if needed. However, no one except the investigator had access to the list at any time. After the first assignment as described above, the students automatically moved through the design of the experiment as described previously. (See pages 9 and 10)

Introduction to Experiment

The students were acquainted with the methods to be used in the experiment by the investigator. The experiment was started about one month after the start of the semester so that the students were

acquainted with the laboratory and the equipment to be used as well as with the approach of the investigator. The timing was also determined by performing the first demonstration at a time when many of the students were ready to use it on the garments they were constructing. The order of the demonstration was made with time of use, as one of the governing factors; i.e., the facing and zipper would be sewn early in the construction of a garment and the belt would be one of the last parts sewn in the construction of a garment.

Performance of Task

The investigator presented each demonstration to each class in the order specified in the design (see pages 9 and 10) and the task was completed by the students immediately following the demonstration (see Appendix G). Classes were of sufficient length of time to accomplish the task. When each student finished her task, she put her identification number on the product and deposited it on a shelf in a specific cabinet in the laboratory set aside for the purpose. She then returned to her other construction work. At the end of the class period, the investigator gathered all the products of the students and put them in a container for safe keeping. The time elapsed from the presentation of the first demonstration to the completion of the last task was approximately one month.

Evaluation by Judges

The construction and validation of the evaluation instrument was previously described on page 11 of this report. The selection of judges is also described on page 11 of this report.

Each judge was selected on the basis of having had experience in teaching and judging clothing construction projects. Each judge was informed of her task which she performed independently.

Treatment of the Data

The raw data collected from the judges appears in Appendix D. The same data also appears in tabular form in Appendix F. The statistical significance of this data, at the .05 level of probability, was evaluated by two-way analysis of variance, using a finite, fixed model. The differences analyzed through this method were face to face demonstrations versus televised demonstrations; instructional materials versus student notes; and interactions between any of the combinations of teaching methods. In addition, comparisons of means of the pairs were made because of the a priori pairwise formulation provided. These comparisons were: face to face demonstrations combined with illustrative materials versus face to face demonstrations combined with student notes; televised demonstrations combined with illustrative materials versus televised demonstrations combined with student notes; face to face demonstrations combined with illustrative materials versus televised demonstrations combined with illustrative materials; face to face demonstrations combined with student notes versus televised demonstrations combined with student notes.

Chapter IV contains the statistical treatment and analysis of the data gathered in this experiment.

CHAPTER IV

ANALYSIS OF THE DATA

Statistical Data

After the data was gathered according to the procedures described in Chapter III, the evaluations by the five judges were sorted in accordance with the teaching methods received by each of the students and in relation to the demonstration involved, i.e.

Grades for face to face demonstration combined with illustrative materials were derived as follows:

From Demonstration #1, Students 1 through 7

From Demonstration #2, Students 16 through 24

From Demonstration #3, Students 25 through 31

From Demonstration #4, Students 8 through 15

Grades for face to face demonstration combined with student notes were derived as follows:

From Demonstration #1, Students 8 through 15

From Demonstration #2, Students 25 through 31

From Demonstration #3, Students 16 through 24

From Demonstration #4, Students . through 7

Grades for televised demonstration combined with illustrative materials were derived as follows:

From Demonstration #1, Students 16 through 24

From Demonstration #2, Students 8 through 15

From Demonstration #3, Students 1 through 7

From Demonstration #4, Students 25 through 31

Grades for televised demonstration combined with student notes were derived as follows:

From Demonstration #1, Students 25 through 31

From Demonstration #2, Students 1 through 7

From Demonstration #3, Students 8 through 15

From Demonstration #4, Students 16 through 24

The tabulation of the grades in this form appears in Appendix F.

The first three hypotheses were as follows:

1. Achievement in learning a psychomotor skill, specifically a clothing construction technique, is not significantly different when utilizing face to face demonstration than when using the same demonstration presented via television.

2. Achievement in learning a psychomotor skill, specifically a clothing construction technique, is not significantly different when utilizing illustrative materials as opposed to using student notes taken during the demonstration.

3. Achievement in learning a psychomotor skill, specifically a clothing construction technique, is not significantly different due to the interaction of the various combinations of treatments used in the experiment.

These hypotheses were tested by a finite, fixed model, two-way

analysis of variance according to procedures described by Ferguson[1]. The results of this analysis of variance are shown in Table 1.

TABLE 1

FIXED MODEL, TWO-WAY ANALYSIS OF VARIANCE

Source	d.f.	SS	MS	F	P
Rows (I.M./S.N.)	1	106.31	106.31	0.328	N.S.
Columns (FF/TV)	1	956.83	956.83	2.950	N.S.
Interaction	1	845.26	845.26	2.610	N.S.
Within Cells	556	181,286.00	324.30		
Total	559	183,194.00			

The analysis of variance for the first three hypotheses indicate that there was no significant difference in achievement of the students using face to face demonstrations versus televised demonstrations; there was no significant difference using illustrative materials versus student notes; there was no significant interaction existing within any of the combinations of treatments.

Although no significant difference was established at the .05 level of probability in the two-way analysis of variance, additional pairwise comparison of means were made because of the a priori pair-wise formulation of such procedure. Orthogonal comparisons which were

[1]G. A. Ferguson, Statistical Analysis in Psychology and Education, Second Edition (New York: McGraw Hill Book Company, 1966, pp. 295-297, 300-323).

independent of each other, were made using the following relationship:

$$F_{ij} = t_{ij}^2 = \frac{n(\bar{X}_i - \bar{X}_j)^2}{2 S_w^2}$$

wherein $n = 140$

$S = 324.304$

$\bar{X}_1 = 82.0286$

$\bar{X}_2 = 78.7000$

$\bar{X}_3 = 76.9571$

$\bar{X}_4 = 78.5490$

The following F or t^2 ratios were obtained:

$\bar{X}_1$ vs $\bar{X}_2 = 2.392$

$\bar{X}_1$ vs $\bar{X}_3 = 5.552$

$\bar{X}_2$ vs $\bar{X}_4 = 0.005$

$\bar{X}_3$ vs $\bar{X}_4 = 0.547$

Reference to a table of Critical Values for the F Ratio Test reveals that for degrees of freedom 1 and 556, the ratio of 3.85 corresponds to a 5% significance level. From the foregoing tabulation it is seen that all comparisons lack significance except for $\bar{X}_1$ vs $\bar{X}_3$ which is significant at the 5% level.

The hypotheses numbered 4, 5, 6, and 7 state:

4. Achievement in learning a psychomotor skill, specifically a clothing construction technique, is not significantly different when face to face demonstration is combined with the use of illustrative materials as opposed to being combined with student notes, taken during the demonstration.

5. Achievement in learning a psychomotor skill, specifically

a clothing construction technique, is not significantly different when face to face demonstration is combined with illustrative materials as opposed to televised demonstration when combined with illustrative materials.

6. Achievement in learning a psychomotor skill, specifically a clothing construction technique, is not significantly different when televised demonstration is combined with illustrative materials as opposed to being combined with student notes.

7. Achievement in learning a psychomotor skill, specifically a clothing construction technique, is not significantly different when face to face demonstration is combined with student notes as opposed to televised demonstration being combined with student notes.

No significant difference is indicated in any of these combinations of methods except hypothesis 5, face to face demonstration combined with illustrative materials as opposed to televised demonstration combined with illustrative materials.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The problem of this study was to determine if college students taking clothing construction courses, which require performing skilled perceptual motor acts, learn as well from specific sewing technique demonstrations presented face to face as they do via the modified perspective of television; and if they learn as well from combining the demonstrations with illustrative materials or combining with their notes taken during the demonstrations.

To test these questions an experiment was conducted during the fall semester of the year 1971 which involved thirty-one clothing construction students in the two sections of Advanced Clothing Construction at Central State University meeting during that semester. The statistical significance of the data was analyzed by a finite, fixed model, two-way analysis of variance, and by independent, orthogonal, pairwise comparisons. These analyses were described in Chapter IV (see pp. 49-50).

The analysis of the data revealed the following findings as answers to the preceding questions.

Findings and Interpretations

The data in Table 1 (see page 49) of this study indicate that students can learn clothing construction techniques as well from televised demonstrations as they can from face-to-face demonstrations. They can also perform the task as well from using illustrative materials after the demonstration as they can from using their notes taken during the demonstration. It was further determined that there was no significant interaction within the various combinations used in the experiment.

Concerning the comparisons between the pairs of combinations (see pages 49-50), it was indicated there was no significant difference between any of the pairs tested except one, that being between face-to-face demonstrations combined with illustrative materials as opposed to televised demonstrations combined with illustrative materials. The first was significantly better at the .05 level of probability than the second.

Conclusions

On the basis of the findings of this experiment the following conclusions are drawn by the investigator:

1. The Advanced Clothing Classes taught at Central State University by the investigator could utilize televised demonstrations in teaching the advanced clothing construction techniques without affecting the performance of the students in the class in their ability to learn to perform the task being demonstrated.

2. The students in the Advanced Clothing Classes can perform the task as well by using the illustrative materials combined with the demonstration as they can by using their notes taken during the

demonstration.

3. There is no interaction within any media combinations tested which would significantly affect the ability of the students to perform the task demonstrated.

4. Any of the combinations of methods tested probably can be utilized with equal effectiveness as a teaching device. The one pairwise test between face to face demonstration combined with illustrative materials was significantly better in a statistical sense than the televised demonstration combined with illustrative materials. However, the analysis of variance test accepted the null hypothesis and did not support the pairwise test result. The more powerful analysis of variance test based on a larger population than the test between the pairs of combinations would have better validity.

Recommendations

The findings of this study indicate that the student can learn readily from the teaching methods utilizing the combinations of media which were under investigation in the study. It is, therefore, recommended that Central State University could adopt the use of televised demonstrations of clothing construction techniques for the Advanced Clothing Construction classes taught by the investigator. It is further recommended that the use of illustrative materials could be utilized in these classes. The use of these two forms of media would have certain advantages to those involved in the classes for the following reasons:

1. After the initial preparation time involved in making the televised demonstrations and the illustrative materials, which is considerable, the instructor could be more available for individual student

help in the laboratory sessions.

2. The individual student could play the televised demonstration when she was ready for that particular task, and not have to depend on when it was convenient for the instructor to give the demonstration in a face to face situation to the whole class at one time. The possibility of the instructor giving each student the demonstration face to face on an individual basis, when the student is ready for it, would not be possible because of the time involved.

3. Absentees could also make-up the work they missed upon their return to class without using the instructor's time in bringing the student up-to-date.

4. Although much of the material presented by the instructor of clothing construction could be televised and incorporated in a set of illustrative materials, there is much of the instruction that would not lend itself to this practice; i.e., many kinds of fabrics on which the students would be working present individual problems and must be dealt with on an individual basis; individual fitting of the student could not be effected except on an individual basis. It would, therefore, be necessary that the instructor always be available in the laboratory while the class is in session, for consultation.

5. The materials prepared for televising and the illustrative materials could be used by several sections without interference provided they are taught by the same instructor, thereby reducing the preparation time for the instructor. In a larger school where there may be more sections taught by various instructors, there would have to be much cooperation among the instructors to make certain they are teaching the same

methods before the materials could be interchanged between the sections.

6. Many techniques may be viewed better by the students if they were presented via television because of the close-up magnification possible through this medium. When presenting a televised demonstration, each student has a "front row seat".

Recommendations for Further Study

This study indicated there was no significant difference in the demonstration methods tested. This does confirm the findings of much of the research concerned with this aspect of the use of media. However, it would be of interest to know why this study revealed no difference in the use of student notes taken during the demonstration as opposed to not taking notes during the demonstration, and giving their undivided attention to the demonstration. Much of the research concerned with the aspect of students taking notes during motion pictures and television presentations, indicate that taking notes during the presentation detracts from the learning derived from the presentation.

It would also be of interest to know if these findings would be the same if the experiment were conducted with a younger age group who may be less adept at taking notes.

Another interesting study would be to use a larger sample and categorize the students on the basis of I.Q. level, and deal with only one task.

Still another study of interest would be to develop a test that would take into account a delay in time from when the demonstration was presented to the time the student performed the task. The use of student notes versus the illustrative materials may show some significant

differences. This particular study involved having the students performing the task immediately following the demonstration while memory could play a large part in the performance of the task.

SELECTED BIBLIOGRAPHY

Allen, W. H. Media stimulus and types of learning, Audiovisual Instruction, January, 1967, pp. 27-31.

Askins, B. E. The effectiveness of two different uses of an autoinstructional program to teach the use of the Air Force fiscal account structure and codes, Ed.D. Thesis, North Texas State University, Denton, Texas, 1967. Abstracted by Research in Education, Washington, D.C. Educational Research Information Center, Pub. ERIC Doc. ED 026601.

Blancheri, R. L. and Merrill, I. R. The step presentation of dental technic instruction, Research in Instructional Television and Film, summaries of studies by J. Christopher Reid and Donald W. MacLennan, Washington, D.C., U.S. Dept. HEW Report, 1967.

Brown, J. W., Lewis, R. B., and Harcleroad, F. F. AV Instruction Media and Methods. New York: McGraw-Hill Book Company, 1969.

Brown, R. C., Jr. Evaluation of instructional television, A Guide to Instructional Television (Ed. by R. M. Diamond). New York: McGraw-Hill Book Company, 1964.

Carpenter, C. R. New Teaching Aids for the American Classroom, report prepared and published by the Institute for Communications Research, Stanford University, Stanford, California, 1960.

Chu, G. G. and Schramm, W. Learning from television: what the research says, To Improve Learning (Ed. by S. G. Tickton), Vol.1 of 2 Vols. New York: R. R. Bowker Company, 1970.

Coleman, R. R. Television in the art class, A Guide to Instructional Television (Ed. by R. M. Diamond). New York: McGraw-Hill Book Company, 1964.

Costello, L. F. and Gordon, G. N. Teach with Television. New York: Communications Arts Books, Hastings House Publishers, 1961.

Dale, E. Audiovisual Methods in Teaching (Third Edition). New York: The Dryden Press, 1969.

Ferguson, G. A. Statistical Analysis in Psychology and Education (Second Edition). New York: McGraw-Hill Book Company, 1966.

Fitts, P. M. Factors in complex skill training, Training Research and Education (Ed. by Robt. Glaser). Pittsburgh: University of Pittsburgh Press, 1963.

Gagne, R. M. Conditions of Learning. New York: Holt, Rinehart, and Winston, Inc., 1967.

Gagne, R. M. Some new views of learning and instruction, Phi Delta Kappan, May, 1970, pp. 468-472.

Gordon, G. N. Educational Television. New York: The Center for Applied Research in Education, Inc., 1965.

Gordon, G. N. Classroom Television: New Frontiers in ITV. New York: Communications Arts Books, Hastings House Publishers, 1970.

Greenhill, L. P. Research on instructional television past and future, Teaching by Television (Ed. by B. I. Griffith and D. W. MacLennan). Columbia, Missouri: University of Missouri Press, 1964.

Gross, Lynne Schafer. An assessment of the effectiveness of teacher study guides used in conjunction with educational television lessons, Published Thesis, School of Education, California University, Berkely, California, 1968. Abstracted by Research in Education, Washington, D.C. Educational Research Information Center, Pub. ERIC Doc. ED 040593.

Hatcher, Hazel M. and Andrews, Mildred E. The Teaching of Home Economics. Boston: Houghton Mifflin Company, 1963.

Herr, J. F. Illustrated instruction sheets as a supplement to teaching manipulative operations in graphic arts via video taped closed circuit television, Published Ed.D. Thesis, University of Missouri, Columbia, Missouri, 1970. Abstracted by Research in Education, Washington, D.C. Educational Research Information Center, Pub. ERIC Doc. ED 040593.

Hoban, C. F., Jr. Research in new media in education (three conference working papers, Washington, D.C., American Association of Colleges for Teacher Education, 1961), Audiovisual Methods in Teaching (Third Edition). New York: The Dryden Press, 1969.

Hoban, C. F., Jr. New Teaching Aids for the American Classroom, report prepared and published by the Institute for Communication Research, Stanford University, Stanford, California, 1960.

Huffman, S. A., Jr. A comparative analysis of four instructional methods in eighth grade science, Research in Instructional Television and Film, summaries of studies by J. Christopher Reid and Donald W. MacLennan, Washington, D.C., U.S. Dept. HEW Report, 1967.

LeMaster, L. K. Filmed demonstrations with manual class demonstrations vs conventional demonstrations in introductory woodwork, Research in Instructional Television and Film, summaries of studies by J. Christopher Reid and Donald W. MacLennan, Washington, D.C., U.S. Dept. HEW Report, 1967.

McVay, D. R. Video-taped Instruction for the Teaching of Skills, Shoreline Community College, Seattle, Washington, Report to Washington State Community College System, July 17, 1969.

Meacham, Esther. Television if the clothing classroom, Journal of Home Economics, Vol. 56, No. 2, February, 1965, pp. 89-94.

Meaney, J. W. Televised College Courses, report from the Fund for the Advancement of Education, 477 Madison Avenue, New York, N.Y., 1962.

Richter, R. E. Television in the anatomy laboratory, A Guide to Instructional Television (Ed. by R. M. Diamond). New York: McGraw-Hill Book Company, 1964.

Russell, J. J. IV. Comparitive effects of seven verbal-visual presentation modes upon learning tasks, Published Thesis, University of Southern California, Los Angeles, California, 1970.

Stickell, D. W. A critical review of the methodology and results of research comparing televised and face-to-face instruction, Ed.D. Dissertation, Pennsylvania State University, University Park, Pennsylvania, 1963.

APPENDIX A

PHOTOGRAPH OF ILLUSTRATIVE MATERIAL

Typical Illustrative Material

Folder No. 2, Bound Buttonhole

APPENDIX B

EVALUATION INSTRUMENTS

NECKLINE FACING AROUND LAPPED ZIPPER APPLICATION

Maximum Points		Operation to be judged
15	A.	Left side of facing turned back 1-1/8", trimmed to 1/2"
5	B.	Right side of facing turned back 1/2"
5	C.	Facing stitched to neckline smoothly
15	D.	Seam graded away except for 1-1/8" on bodice left side
5	E.	Neckline seam understitched starting 1/2" from left end of facing
15	F.	Untrimmed seam allowance turned down and caught in zipper application
10	G.	Zipper set down 1/2" from finished neck edge
15	H.	Top zipper tape trimmed approximately at neckline seam
10	I.	Zipper tape pulled back at angle and raw ends covered by facing
5	J.	Facing caught down by hand around zipper, neatly

INVISIBLE ZIPPER

Maximum Points		Operation to be judged
10	A.	Stitching straight around zipper
25	B.	Stitching close to teeth of zipper on both sides of zipper
10	C.	Zipper positioned about 1" from top of fabric
20	D.	Smooth appearance at bottom of zipper on outside of fabric
20	E.	No gap in seam at bottom of zipper
5	F.	No hand sewing at bottom of zipper
10	G.	Bottom of zipper tape sewn to seam allowance on both sides

BUTTONHOLES

Maximum Points		Operation to be judged
5	A.	Patch about 2-1/2" square, buttonhole #1
5	B.	Patch about 2-1/2" square, buttonhole #2
10	C.	Lips of buttonhole #1 even
10	D.	Lips of buttonhole #2 even
20	E.	Square even corners on buttonhole #1
20	F.	Square even corners on buttonhole #2
5	G.	Ends sewn with tiny stitches, buttonhole #1
5	H.	Ends sewn with tiny stitches, buttonhole #2
15	I.	Both buttonholes look alike
5	J.	Pressing good, not too flat, no shine, no imprint

BELT

Maximum Points		Operation to be judged
5	A.	Point cut medium sharp
10	B.	Belting placed evenly and exactly along selvage
5	C.	Basting through center of belting and fabric
5	D.	Regular stitching through belting along edge opposite selvage
15	E.	Stitching of point sharp, next to belting, tiny stitches, seam trimmed
10	F.	Fabric turned to right side, extension tucked under selvage
25	G.	Stitching straight around belt through belting
25	H.	Stitching is an even distance from edge all around belt

APPENDIX C

CORRELATION OF JUDGES

CORRELATION OF JUDGES

Demonstration	Mean Grade			Correlation Between Judges		
	Judge 1	Judge 2	Judge 3	Pair 1, 2	Pair 1, 3	Pair 2, 3
Neckline facing	79.40	79.73	64.53	.842	.803	.779
Invisible zipper	90.11	85.00	78.36	.804	.817	.850
Bound buttonhole	80.59	64.31	66.17	.788	.802	.765
Belt	85.96	84.33	76.33	.676	.842	.837

APPENDIX D

EVALUATION RAW DATA

NECKLINE FACING AROUND LAPPED ZIPPER APPLICATION
JUDGE #1

Subject Number	Operation to be Judged (Points)*										
	A	B	C	D	E	F	G	H	I	J	Total
1	15	5	5	15	5	12	8	15	10	5	95
2	15	5	3	15	2	15	5	15	5	5	85
3	15	5	5	15	5	12	5	5	10	5	82
4	15	5	5	15	3	13	7	15	0	5	83
5	15	5	5	15	2	0	0	0	0	0	42
6	15	5	5	15	5	15	10	15	10	5	100
7	15	5	5	15	5	13	10	7	5	5	85
8	10	5	5	12	0	0	15	15	5	5	72
9	10	5	5	15	15	10	10	10	0	0	80
10	15	5	2	15	2	0	10	15	0	3	67
11											
12	15	5	4	15	2	15	10	15	10	5	96
13	7	5	5	15	3	15	10	0	0	3	63
14	15	5	3	15	5	15	9	15	10	5	97
15	15	5	5	15	3	15	10	12	0	5	85
16	15	5	5	15	3	10	12	15	8	5	93
17	15	5	3	15	0	0	10	10	0	5	63
18	15	5	3	15	5	15	10	15	0	3	86
19	15	0	5	15	5	8	10	15	0	2	75
20	8	5	0	12	5	15	10	10	10	5	80
21	15	5	0	15	3	15	10	15	10	5	93
22	8	5	5	15	5	15	8	15	5	3	84
23	15	5	5	15	3	15	10	15	10	5	98
24	15	5	5	15	3	15	10	15	10	5	98
25	0	0	3	15	0	15	0	0	0	5	38
26	15	5	2	8	3	10	5	15	0	5	68
27	8	5	3	15	3	13	10	15	5	0	77
28	15	5	5	15	2	5	10	15	0	0	72
29	15	5	3	15	5	4	10	15	10	5	87
30	10	5	5	15	5	3	10	15	10	0	78
31	15	5	3	8	0	4	10	15	0	0	60

* See Page 64 for Letter Key

NECKLINE FACING AROUND LAPPED ZIPPER APPLICATION
JUDGE #2

Subject Number	Operation to be Judged (Points)*										
	A	B	C	D	E	F	G	H	I	J	Total
1	15	5	5	15	5	10	10	10	6	4	85
2	15	5	5	15	3	15	10	7	8	3	86
3	14	5	5	15	2	15	0	0	10	3	69
4	15	5	5	10	3	9	10	15	5	4	81
5											
6	15	5	5	15	5	15	10	15	10	5	100
7	15	5	5	15	3	15	10	15	7	2	92
8	15	5	4	15	4	6	10	11	5	1	76
9	15	5	4	14	5	15	10	15	1	1	85
10	15	5	4	10	5	15	10	10	7	0	81
11											
12	15	5	5	15	5	15	10	15	10	5	100
13	10	5	5	15	1	0	10	2	0	0	48
14	15	5	5	15	5	15	10	15	10	5	100
15	15	5	5	15	5	13	10	10	10	5	93
16	15	5	5	15	4	14	10	15	9	4	96
17	9	5	4	10	0	0	10	10	0	2	41
18	15	5	5	15	5	10	10	15	5	2	87
19	15	5	4	10	2	14	10	10	1	1	72
20	5	5	4	15	5	10	5	10	10	4	73
21	12	5	5	15	5	10	10	15	10	3	90
22	8	5	5	15	2	7	7	15	5	3	72
23	10	5	5	15	5	7	10	15	10	5	87
24	15	5	5	15	5	15	10	15	10	4	99
25	15	3	4	15	3	5	0	0	0	1	46
26	15	4	5	15	5	10	4	15	0	1	74
27	0	5	5	15	5	15	10	15	5	5	80
28	7	5	5	12	3	15	10	15	0	1	73
29	13	5	5	15	5	15	10	15	10	5	98
30	15	5	5	10	3	15	10	15	7	0	85
31	15	5	3	2	2	10	10	15	0	1	63

* See Page 64 for Letter Key

NECKLINE FACING AROUND LAPPED ZIPPER APPLICATION
JUDGE #3

Subject Number	Operation to be Judged (Points)*										
	A	8	C	D	E	F	G	H	I	J	Total
1	15	5	5	15	5	10	10	15	10	5	95
2	15	5	5	12	2	15	8	0	3	5	70
3	10	4	5	14	2	10	3	0	10	3	61
4	15	5	3	7	2	10	8	0	0	3	53
5											
6	13	5	5	15	2	13	10	12	10	5	90
7	10	3	5	12	5	7	3	5	5	2	57
8	14	4	3	5	0	0	10	12	5	4	57
9	10	4	5	12	4	0	7	15	0	0	57
10	7	2	5	5	2	2	3	15	0	3	44
11											
12	15	4	5	14	2	15	10	15	10	4	94
13	8	4	4	5	2	10	7	0	0	1	41
14	15	5	4	12	5	13	5	15	10	5	89
15	15	5	5	7	2	15	10	15	0	5	79
16	13	5	5	15	2	5	10	8	6	2	71
17	8	4	4	2	0	2	10	13	0	4	47
18	8	5	5	15	5	15	5	13	5	4	80
19	13	5	2	5	2	14	3	8	0	2	54
20	8	5	5	15	4	10	3	0	5	4	59
21	10	4	3	12	1	8	3	8	6	5	60
22	8	4	3	9	3	14	9	8	5	1	64
23	14	5	5	15	3	2	8	15	10	5	82
24	13	3	5	15	3	10	10	15	10	5	89
25	5	4	3	2	0	2	0	0	0	3	19
26	13	5	2	10	2	10	5	8	0	4	59
27	8	4	5	12	2	15	5	7	5	1	64
28	7	5	5	2	2	12	5	13	0	1	52
29	12	5	5	14	5	15	10	15	10	4	95
30	8	4	4	0	4	8	8	5	8	2	51
31	15	3	3	0	0	5	3	13	0	1	43

* See Page 64 for Letter Key

NECKLINE FACING AROUND LAPPED ZIPPER APPLICATION
JUDGE #4

Subject Number	Operation to be Judged (Points)*										
	A	B	C	D	E	F	G	H	I	J	Total
1	15	5	5	15	5	13	10	14	5	3	90
2	15	5	5	12	5	10	9	10	5	3	79
3	15	5	5	14	5	15	2	5	10	4	80
4	15	5	5	14	2	15	5	14	2	5	82
5	15	5	5	2	5	10	9	14	0	0	65
6	15	5	5	15	1	15	10	14	10	5	95
7	15	5	5	15	5	15	10	7	2	2	81
8	13	5	5	14	0	12	10	4	2	5	70
9	14	5	5	13	5	10	10	14	2	2	80
10	14	5	3	14	4	10	9	14	7	1	81
11											
12	15	5	5	15	5	15	10	15	9	4	98
13	10	3	5	15	5	15	10	15	2	0	80
14	15	5	4	15	5	15	10	15	10	5	99
15	15	5	5	10	5	15	10	15	1	5	86
16	15	5	5	10	5	14	10	14	2	2	82
17	15	5	5	0	0	5	2	15	1	5	53
18	15	5	5	15	5	15	8	15	1	4	88
19	5	5	5	14	0	15	2	10	2	3	61
20	15	5	5	15	5	15	10	14	10	5	99
21	15	5	1	15	5	15	2	15	10	5	88
22	10	5	5	15	5	15	10	12	5	0	82
23	15	5	5	15	4	15	10	14	10	5	98
24	15	5	5	15	2	15	10	15	10	5	97
25	0	0	0	5	0	15	0	15	10	5	50
26	10	5	5	15	1	15	10	14	1	4	80
27	10	5	5	15	1	12	5	15	10	2	80
28	15	5	0	12	0	15	1	10	0	2	60
29	14	5	5	15	5	15	5	15	10	5	94
30	10	4	3	5	1	15	10	14	10	0	72
31	15	5	2	14	0	3	10	14	1	1	65

* See Page 64 for Letter Key

NECKLINE FACING AROUND LAPPED ZIPPER APPLICATION
JUDGE #5

Subject Number	Operation to be Judged (Points)*										
	A	B	C	D	E	F	G	H	I	J	Total
1	15	5	5	15	5	15	10	15	10	5	100
2	15	5	5	15	4	10	5	10	5	5	79
3	14	5	4	15	4	15	3	5	10	4	79
4	15	5	4	13	4	13	10	15	5	4	88
5	10	5	4	15	4	10	10	15	0	0	73
6	15	5	4	15	4	15	10	15	10	5	98
7	15	5	4	15	5	15	10	10	5	1	85
8	15	5	4	15	0	0	10	15	5	4	73
9	15	5	4	15	3	15	10	15	5	2	89
10	12	4	3	15	4	0	10	15	5	2	70
11											
12	15	5	5	15	4	15	10	15	10	5	99
13	15	5	5	15	4	15	10	5	3	2	79
14	15	5	5	15	5	15	10	15	10	5	100
15	15	5	5	13	4	13	10	15	3	4	87
16	15	5	5	15	4	13	10	15	7	3	92
17	10	5	2	5	0	0	10	15	3	4	54
18	15	5	5	15	5	15	10	15	7	5	97
19	15	5	4	15	4	13	10	15	3	2	86
20	10	5	5	15	5	15	10	13	10	5	93
21	15	5	4	15	3	15	9	14	10	5	95
22	10	5	4	15	4	15	10	15	5	2	85
23	15	5	4	15	3	10	10	15	9	5	91
24	15	4	5	15	4	15	10	15	10	5	98
25	10	2	3	13	0	15	0	10	2	1	56
26	15	5	5	15	4	10	9	15	5	3	86
27	10	5	5	15	4	13	10	15	10	3	90
28	14	5	5	5	4	15	10	15	5	2	80
29	15	5	5	15	4	15	10	15	10	5	99
30	15	5	5	15	4	15	10	15	10	4	98
31	15	4	1	3	2	10	10	15	5	2	67

* See Page 64 for Letter Key

INVISIBLE ZIPPER
JUDGE #1

Subject Number	Operation to be Judged (Points)*							
	A	B	C	D	E	F	G	Total
1	10	25	10	20	20	5	10	100
2	10	25	10	17	20	5	10	97
3	10	25	10	20	18	5	10	98
4	10	25	10	20	18	5	10	98
5								
6	10	25	0	20	20	5	10	90
7	10	25	10	20	20	5	10	100
8	10	25	10	20	15	5	0	85
9								
10	10	25	10	20	18	5	10	98
11	10	0	10	20	15	5	0	60
12	8	10	10	20	20	5	10	83
13	10	20	10	20	17	5	10	92
14	10	25	10	16	20	5	10	96
15	5	25	10	18	15	5	10	88
16	10	25	10	20	20	5	10	100
17	10	25	10	20	10	5	10	90
18	10	25	8	15	18	5	10	91
19								
20	10	25	8	20	20	5	10	98
21	10	25	0	18	15	5	10	83
22	10	25	10	20	20	0	10	95
23	10	25	10	20	20	5	10	100
24	10	25	10	20	20	5	10	100
25	10	25	0	15	5	5	10	70
26	10	25	0	18	10	5	10	78
27	5	25	10	15	10	5	8	78
28	10	15	9	20	10	5	10	79
29	10	25	10	20	20	5	10	100
30	7	15	10	20	10	5	10	77
31	8	25	8	10	10	5	10	76

* See Page 65 for Letter Key

INVISIBLE ZIPPER
JUDGE #2

Subject Number	Operation to be Judged (Points)*							
	A	B	C	D	E	F	G	Total
1	10	25	10	20	20	5	10	100
2	10	24	10	20	20	5	10	99
3	10	24	10	20	20	5	10	99
4	10	25	10	20	12	5	10	92
5								
6	10	25	10	20	20	5	10	100
7	10	24	10	20	20	0	0	84
8	8	15	10	20	7	5	0	65
9								
10	10	21	9	20	20	5	10	95
11	7	5	8	20	10	5	0	55
12	7	22	9	20	10	5	10	83
13	10	25	10	20	18	5	0	88
14	10	23	10	20	20	5	10	98
15	8	20	8	19	15	5	0	75
16	10	25	9	20	20	5	10	99
17	10	22	9	20	5	5	0	81
18	8	22	7	20	18	5	10	90
19								
20	10	22	10	20	15	5	7	89
21	10	25	0	20	5	5	10	75
22	10	20	8	20	15	5	7	85
23	10	25	10	20	20	5	7	97
24	10	25	9	20	20	5	10	99
25	10	25	0	20	5	5	10	75
26	8	25	0	20	18	5	10	86
27	5	20	10	17	3	5	7	67
28	9	15	9	20	18	5	10	86
29	10	25	10	20	20	5	10	100
30	10	15	8	20	3	5	10	71
31	10	20	7	0	0	0	10	47

* See Page 65 for Letter Key

INVISIBLE ZIPPER
JUDGE #3

Subject Number	Operation to be Judged (Points)*							
	A	B	C	D	E	F	G	Total
1	10	21	10	20	20	5	10	96
2	10	24	10	20	20	5	10	99
3	9	20	6	20	20	5	10	90
4	10	21	8	20	20	5	10	94
5								
6	10	21	8	20	20	5	10	94
7	10	22	10	20	20	5	5	92
8	10	20	6	10	15	5	0	66
9								
10	10	21	6	20	20	5	10	92
11	3	3	6	20	20	5	0	57
12	3	6	8	20	10	5	10	62
13	10	25	9	20	20	5	5	94
14	8	12	8	18	20	5	10	81
15	5	12	6	20	10	5	5	63
16	10	24	6	20	20	5	10	95
17	10	12	6	20	7	5	10	70
18	3	8	7	18	20	5	10	71
19								
20	8	17	10	20	20	5	8	88
21	10	15	0	20	15	5	10	75
22	5	12	6	20	20	5	10	78
23	8	20	9	20	20	5	10	92
24	10	20	8	20	20	5	10	93
25	3	12	3	20	10	5	10	63
26	3	8	0	20	12	5	7	55
27	3	15	7	18	10	5	10	68
28	5	12	6	17	20	5	10	75
29	10	20	6	20	20	5	10	91
30	5	12	6	18	12	5	7	65
31	3	15	4	0	0	5	8	35

* See Page 65 for Letter Key

INVISIBLE ZIPPER
JUDGE #4

Subject Number	Operation to be Judged (Points)* A	B	C	D	E	F	G	Total
1	9	24	10	20	20	5	10	98
2	8	23	9	20	20	5	10	95
3	9	24	10	20	20	5	10	98
4	8	25	10	19	17	5	10	94
5								
6	10	25	8	20	20	5	10	98
7	10	25	0	20	20	0	8	83
8	10	25	10	20	0	5	0	70
9								
10	5	25	10	20	20	5	10	95
11	10	0	10	10	10	5	0	45
12	8	10	10	10	18	5	10	71
13	10	24	10	20	20	0	10	94
14	10	24	10	18	20	5	10	97
15	8	25	10	20	10	0	10	83
16	10	20	8	20	19	5	10	92
17	10	22	10	20	10	5	9	86
18	20	10	2	20	18	5	10	85
19								
20	10	25	3	20	20	5	5	88
21	8	23	0	20	10	5	10	76
22	8	15	10	20	10	5	3	71
23	10	24	10	20	18	5	10	97
24	10	13	5	20	19	5	9	81
25	9	12	0	20	15	5	9	70
26	8	25	0	20	15	5	5	78
27	5	18	10	15	10	5	8	71
28	6	12	10	20	20	5	5	78
29	10	24	10	20	20	5	10	99
30	2	5	9	20	18	5	10	69
31	10	23	2	15	18	0	10	78

* See Page 65 for Letter Key

INVISIBLE ZIPPER
JUDGE #5

Subject Number	Operation to be Judged (Points)*							
	A	B	C	D	E	F	G	Total
1	10	22	6	20	20	5	10	93
2	10	22	5	20	20	5	10	92
3	10	22	2	19	20	5	10	88
4	8	20	4	19	18	5	10	84
5								
6	10	21	2	19	20	5	10	87
7	10	20	9	19	20	5	8	91
8	9	20	6	17	15	5	0	72
9								
10	8	20	3	19	20	5	10	85
11	8	5	3	15	20	5	0	56
12	6	8	6	15	15	5	10	65
13	9	24	6	15	18	5	8	85
14	8	15	6	18	20	5	10	82
15	7	23	4	15	18	5	10	82
16	10	24	5	20	20	5	10	94
17	8	15	5	15	3	5	10	61
18	8	23	6	18	20	5	10	90
19								
20	10	25	8	20	20	5	10	98
21	9	22	0	19	18	5	10	83
22	8	13	5	19	19	5	9	78
23	8	24	6	18	20	5	10	91
24	9	24	5	20	20	5	10	93
25	5	20	5	15	10	5	10	70
26	9	24	0	18	13	5	10	79
27	5	20	6	13	10	5	10	69
28	5	13	4	15	15	5	10	67
29	10	25	5	20	18	5	10	93
30	9	13	5	19	15	5	10	76
31	5	20	4	0	0	5	10	44

* See Page 65 for Letter Key

BUTTONHOLES
JUDGE #1

Subject Number	Operation to be Judged (Points)*										
	A	B	C	D	E	F	G	H	I	J	Total
1	5	5	10	10	20	20	5	5	14	5	99
2	5	5	9	10	20	20	5	5	14	4	97
3	5	5	10	10	15	12	5	5	8	4	79
4	5	5	9	7	18	20	5	5	9	3	86
5											
6	5	2	0	0	0	0	0	0	0	0	7
7	5	5	9	7	18	10	5	5	0	5	69
8	5	5	8	7	19	19	5	2	15	5	90
9	5	5	8	10	20	20	5	5	12	5	95
10	5	5	7	0	8	0	0	0	0	2	27
11	5	5	7	9	15	15	2	2	12	4	76
12	5	5	10	9	20	20	5	5	14	5	98
13	5	5	10	10	15	10	5	5	15	4	84
14	5	5	6	10	20	20	5	5	15	5	96
15	5	5	6	6	16	12	5	5	11	4	75
16	5	5	9	10	20	16	5	5	15	5	95
17	5	5	8	9	18	16	5	5	9	5	85
18	5	5	0	10	20	20	5	5	15	5	98
19	5	5	10	7	20	9	5	2	7	4	74
20	5	5	8	8	18	18	5	5	13	5	90
21	5	5	10	10	12	18	5	3	8	5	81
22	5	5	6	9	12	14	2	3	10	4	70
23	5	5	10	10	20	10	5	3	15	5	88
24	5	5	10	10	20	16	5	5	15	5	96
25	5	5	8	0	13	0	5	0	0	4	40
26	5	5	10	10	20	20	5	5	14	5	99
27	5	5	10	10	15	20	3	5	15	4	92
28	5	5	8	10	20	10	0	3	14	5	80
29	5	5	9	9	20	20	5	5	10	4	92
30	5	5	10	8	15	13	5	5	10	3	79
31											

* See Page 66 for Letter Key

BUTTONHOLES
JUDGE #2

Subject Number	Operation to be Judged (Points)*										
	A	B	C	D	E	F	G	H	I	J	Total
1	2	1	9	8	18	17	5	5	15	4	84
2	4	3	10	8	18	18	4	4	12	4	85
3	2	2	8	6	10	10	5	5	2	3	53
4	2	5	8	9	16	15	5	5	10	4	79
5											
6	2	0	0	0	0	0	0	0	0	0	2
7	0	1	0	8	0	14	0	4	0	3	30
8	1	4	6	5	18	10	2	3	10	3	62
9	2	1	9	8	18	17	4	4	12	3	78
10	1	1	4	0	10	0	0	0	0	0	16
11	0	1	5	7	17	16	3	2	8	4	63
12	5	5	8	9	20	20	5	5	15	5	97
13	3	3	10	9	14	12	4	4	14	3	76
14	3	3	10	10	20	20	5	5	15	5	96
15	4	4	9	7	18	17	5	4	12	4	84
16	4	4	10	10	18	17	5	5	13	5	91
17	1	1	4	4	3	2	2	2	10	4	33
18	5	5	8	9	18	19	5	5	15	5	94
19	2	0	10	4	17	10	5	0	10	3	61
20	1	1	8	4	10	10	2	3	10	2	51
21	1	1	1	3	0	2	1	1	7	2	19
22	2	1	8	4	10	4	2	3	10	3	47
23	4	1	7	4	8	7	3	2	7	4	47
24	4	3	10	10	20	18	5	5	13	5	93
25	3	0	8	0	10	0	4	0	0	0	25
26	5	5	10	10	20	20	5	5	15	5	100
27	4	4	6	8	19	19	2	5	10	4	81
28	2	1	8	8	10	9	0	0	12	4	54
29	2	2	9	8	19	19	5	4	10	3	81
30	2	2	9	8	19	18	5	4	12	4	83
31											

* See Page 66 for Letter Key

BUTTONHOLES
JUDGE #3

Subject Number	Operation to be Judged (Points)*										
	A	B	C	D	E	F	G	H	I	J	Total
1	5	5	8	8	10	10	3	5	5	2	61
2	5	5	10	8	20	10	2	2	10	3	75
3	5	5	8	8	10	10	5	5	5	3	64
4	5	5	8	7	15	15	5	3	5	3	71
5											
6											
7	5	5	5	9	8	15	5	3	2	3	60
8	5	5	5	5	10	10	1	3	7	3	54
9	5	5	7	8	8	10	5	3	9	3	63
10	5	5	0	8	0	7	0	0	0	0	25
11	5	5	10	8	17	15	2	2	11	3	78
12	5	5	10	10	20	20	5	4	15	5	99
13	5	5	9	9	15	20	3	3	13	4	86
14	4	4	10	9	15	17	4	5	14	4	86
15	5	5	3	3	7	7	3	4	7	3	47
16	5	5	10	10	15	15	3	3	14	3	83
17	5	5	7	7	7	7	3	4	9	3	57
18	5	5	10	10	20	20	5	5	15	4	99
19	5	5	3	8	5	12	0	3	2	3	46
20	5	5	5	5	10	7	2	4	9	2	54
21	5	5	8	9	12	18	4	4	9	3	77
22	5	5	5	8	8	15	3	4	7	3	63
23	5	5	4	6	10	7	3	3	4	2	49
24	5	5	10	10	20	20	5	5	13	4	97
25	5	5	7	0	12	0	4	0	2	2	37
26	5	5	10	10	20	20	4	5	10	3	92
27	5	5	8	9	13	15	4	2	10	3	74
28	5	5	10	8	13	10	3	2	8	3	67
29	5	5	9	7	17	12	3	3	8	2	71
30	5	5	9	10	13	18	4	4	7	3	78
31											

* See Page 66 for Letter Key

BUTTONHOLES
JUDGE #4

Subject Number	Operation to be Judged (Points)*										
	A	B	C	D	E	F	G	H	I	J	Total
1	5	5	10	10	20	20	5	5	13	5	98
2	5	5	10	10	18	20	5	5	15	3	96
3	5	5	10	6	17	12	5	5	5	5	75
4	5	5	10	10	20	19	5	5	10	5	94
5											
6											
7	5	5	10	10	10	5	5	5	0	5	60
8	5	5	10	10	15	15	5	5	10	5	85
9	5	5	10	10	15	15	4	4	10	1	79
10	5	0	10	0	5	0	0	0	0	0	20
11	4	5	5	10	10	8	4	4	7	2	59
12	5	5	10	10	19	17	4	4	14	4	92
13	5	5	10	10	18	15	5	5	12	4	89
14	5	5	10	10	20	20	5	5	14	5	99
15	5	5	7	8	12	12	5	5	8	5	72
16	4	4	10	10	19	18	5	5	15	4	94
17	4	4	10	10	17	16	5	5	12	1	84
18	5	5	10	10	20	20	5	5	13	5	98
19	5	4	6	10	10	10	5	5	7	1	63
20	5	5	8	10	10	10	0	5	7	3	63
21	5	5	5	10	8	10	1	1	7	4	56
22	5	5	8	5	12	12	3	3	7	3	63
23	4	4	10	7	15	8	4	5	5	4	66
24	5	5	10	8	20	17	5	5	5	3	83
25	5	5	8	0	18	0	5	0	0	0	41
26	5	5	8	10	20	20	5	3	10	5	91
27	5	5	10	10	20	19	5	5	13	5	97
28	5	5	10	9	18	15	5	3	14	1	85
29	5	5	10	10	20	20	4	4	14	5	97
30	5	5	10	10	20	18	5	4	13	3	93
31											

* See Page 66 for Letter Key

BUTTONHOLES
JUDGE #5

Subject Number	Operation to be Judged (Points)*										
	A	B	C	D	E	F	G	H	I	J	Total
1	5	5	8	8	16	16	4	4	12	5	83
2	5	5	10	9	18	18	3	3	14	5	90
3	5	5	9	9	13	15	4	4	10	5	79
4	5	5	8	7	16	16	4	3	12	4	80
5											
6	5	5	0	0	0	0	0	0	0	0	10
7	5	5	10	9	16	14	3	4	7	4	77
8	5	5	9	9	18	18	2	3	13	4	86
9	5	5	10	10	13	12	3	3	12	4	77
10	5	5	6	7	5	3	1	0	0	2	34
11	4	5	8	8	16	16	3	2	12	3	77
12	5	5	10	9	18	20	5	4	14	5	95
13	5	5	10	9	16	16	4	3	13	5	86
14	4	5	9	9	19	19	5	5	14	5	94
15	5	5	9	7	15	15	3	3	12	4	78
16	5	5	10	10	20	18	4	3	13	5	93
17	5	5	9	9	16	17	4	4	13	3	85
18	5	5	10	10	17	20	4	4	13	5	93
19	5	5	10	8	17	12	4	3	8	4	76
20	5	5	10	10	16	15	3	4	12	5	85
21	5	5	8	9	13	19	4	4	10	4	81
22	5	5	2	10	13	15	4	4	10	4	72
23	5	5	9	9	10	8	3	1	5	3	58
24	5	5	10	10	19	19	5	4	13	5	95
25	5	5	9	2	10	0	4	0	2	3	40
26	5	5	8	10	19	20	4	4	13	5	93
27	5	5	8	10	15	19	3	5	13	4	87
28	5	5	9	10	10	12	1	1	12	4	69
29	5	5	10	10	20	20	4	4	12	5	95
30	5	5	9	9	15	15	5	5	14	4	86
31											

* See Page 66 for Letter Key

BELT
JUDGE #1

Subject Number	Operation to be Judged (Points)*								
	A	B	C	D	E	F	G	H	Total
1	5	10	5	5	15	10	25	23	98
2	5	10	5	5	15	10	25	23	98
3									
4	5	10	5	5	15	10	25	23	98
5	5	7	5	5	15	10	25	13	85
6	5	10	3	5	15	10	24	25	97
7	5	10	3	5	5	10	15	20	73
8	5	10	5	5	15	10	10	8	68
9									
10	5	10	5	5	10	10	20	20	85
11	2	10	4	5	8	10	24	20	83
12	5	10	5	5	15	10	25	25	100
13	5	9	5	5	15	10	23	25	97
14	5	10	5	5	15	10	25	25	100
15	4	9	3	5	10	10	20	25	86
16	2	10	2	5	13	10	25	25	92
17									
18	5	10	5	5	15	10	25	23	98
19	4	10	3	5	7	10	12	18	69
20	2	10	4	5	15	10	20	22	88
21	3	2	3	5	5	10	15	20	63
22	5	2	2	2	15	5	5	25	61
23	5	5	5	5	12	10	20	25	87
24	5	10	5	5	15	10	23	25	98
25	5	10	5	5	10	10	23	25	93
26	5	10	3	5	15	0	25	25	88
27	4	10	5	5	15	10	15	15	79
28	0	8	2	5	5	10	25	25	80
29									
30	4	10	5	5	15	10	15	25	89
31	2	6	5	5	5	10	25	10	68

* See Page 67 for Letter Key

BELT
JUDGE #2

Subject Number	Operation to be Judged (Points)*								
	A	B	C	D	E	F	G	H	Total
1	5	10	5	5	15	10	25	25	100
2	4	10	5	5	12	10	24	23	93
3									
4	4	10	4	4	12	10	22	23	89
5	5	10	5	5	10	10	25	23	93
6	5	10	4	5	10	10	20	24	88
7	3	8	3	5	10	10	15	20	74
8	4	9	5	5	10	9	15	12	69
9									
10	4	10	4	5	10	10	12	10	65
11	2	10	5	5	10	10	17	12	71
12	5	10	5	5	13	10	24	24	96
13	3	10	5	5	12	10	22	24	91
14	5	10	5	5	14	10	25	25	99
15	3	10	4	5	13	10	12	15	72
16	2	10	5	5	15	10	25	25	97
17									
18	5	10	5	5	15	10	25	25	100
19	4	10	5	5	5	10	17	15	71
20	2	10	5	4	10	10	19	20	80
21	2	10	5	5	8	7	25	25	87
22	4	10	5	2	12	0	0	0	33
23	5	8	5	5	12	10	24	24	93
24	5	8	5	5	15	10	23	23	94
25	4	10	5	4	13	10	23	24	93
26	5	10	5	5	15	10	25	25	100
27	4	10	5	5	14	8	20	21	87
28	3	10	0	5	8	9	23	23	81
29									
30	4	10	3	4	12	7	15	20	75
31	3	10	5	5	10	8	23	22	86

* See Page 67 for Letter Key

BELT
JUDGE #3

Subject Number	Operation to be Judged (Points)*								
	A	B	C	D	E	F	G	H	Total
1	5	8	5	4	15	10	21	22	90
2	4	9	5	5	11	10	18	18	80
3									
4	5	10	5	5	15	10	23	22	95
5	5	9	5	5	15	10	23	15	87
6	4	6	4	4	8	10	23	22	81
7	4	9	3	5	10	8	15	13	67
8	3	8	5	5	8	6	12	12	59
9									
10	5	9	4	5	10	10	15	15	73
11	2	9	4	5	6	10	18	20	74
12	5	9	5	5	15	10	24	24	97
13	5	8	4	5	11	10	23	22	88
14	3	8	5	5	9	10	22	21	83
15	2	8	4	4	6	10	15	13	62
16	2	9	4	5	8	10	23	23	84
17									
18	5	9	5	5	15	10	23	23	95
19	2	8	0	5	5	5	15	12	52
20	3	9	0	5	10	10	21	23	81
21	2	4	5	5	3	10	18	22	69
22	3	6	0	0	11	8	5	5	38
23	3	8	4	5	6	10	22	22	80
24	5	10	5	5	15	5	20	21	86
25	3	9	5	4	12	10	20	20	83
26	5	9	4	5	15	0	25	24	87
27	2	9	4	5	12	10	18	17	77
28	2	7	0	4	8	9	20	22	72
29									
30	3	9	4	4	8	9	15	12	64
31	2	7	4	4	8	8	12	12	57

* See Page 67 for Letter Key

BELT
JUDGE #4

Subject Number	Operation to be Judged (Points)*								
	A	B	C	D	E	F	G	H	Total
1	5	10	5	5	15	8	25	25	98
2	5	10	5	5	15	8	22	25	95
3									
4	5	10	5	5	15	10	22	25	97
5	5	10	5	5	15	10	22	25	97
6	5	10	5	5	15	10	25	25	100
7	5	10	5	5	15	6	15	24	85
8	5	10	5	5	15	5	15	10	70
9									
10	0	10	5	5	8	10	15	15	68
11	0	10	5	5	15	10	25	20	90
12	5	10	5	5	15	10	25	20	95
13	1	10	5	5	10	10	25	25	91
14	3	10	5	5	15	10	25	25	98
15	0	10	0	5	15	10	20	20	80
16	3	10	0	5	15	10	25	25	93
17									
18	4	10	5	5	15	10	25	25	99
19	5	10	5	5	15	10	5	15	70
20	0	10	5	5	15	10	22	22	89
21	0	0	5	5	0	5	20	25	60
22	5	0	3	5	15	5	5	20	58
23	3	10	5	5	15	10	25	22	95
24	4	10	5	5	15	10	25	25	99
25	4	10	5	5	15	10	25	20	94
26	5	10	5	5	15	0	25	25	90
27	3	10	3	5	10	10	20	25	86
28	0	7	4	5	13	10	25	25	89
29									
30	3	5	5	5	15	10	22	25	90
31	0	5	5	5	5	10	19	15	64

* See Page 67 for Letter Key

BELT
JUDGE #5

Subject Number	Operation to be Judged (Points)* A	B	C	D	E	F	G	H	Total
1	5	10	5	5	15	10	25	20	95
2	4	10	4	5	13	10	23	15	84
3									
4	5	10	4	5	15	10	24	23	96
5	4	9	5	5	15	10	24	15	87
6	4	10	4	5	10	10	25	20	88
7	3	10	4	5	10	10	20	15	77
8	4	9	4	5	14	5	20	15	76
9									
10	4	10	4	5	12	9	20	15	79
11	1	10	4	5	8	8	22	15	73
12	4	10	5	5	12	10	24	23	93
13	4	8	5	5	13	10	25	20	90
14	3	9	4	5	10	10	22	20	83
15	2	10	4	5	12	10	20	15	78
16	1	10	4	5	10	10	24	22	86
17									
18	5	9	4	5	15	10	23	22	93
19	2	8	4	5	7	10	18	15	69
20	2	9	5	5	8	10	20	18	77
21	3	3	4	5	2	10	5	18	50
22	4	3	5	5	11	8	10	10	56
23	4	5	4	5	5	5	15	15	58
24	5	10	5	5	15	9	20	20	89
25	3	9	5	5	12	7	20	20	81
26	4	9	4	5	13	2	22	22	81
27	3	9	4	5	12	9	10	20	72
28	2	6	5	4	10	8	20	22	77
29									
30	3	10	4	4	10	10	15	20	76
31	2	7	5	5	10	6	20	15	70

* See Page 67 for Letter Key

APPENDIX E

RAW DATA, TABULAR FORM BY DEMONSTRATION

TABLE 2

RAW DATA FOR NECKLINE FACING DEMONSTRATION

Subject No.	Judge No. 1	Judge No. 2	Judge No. 3	Judge No. 4	Judge No. 5
1	95	85	95	90	100
2	85	86	70	79	79
3	82	69	61	80	79
4	83	81	53	82	88
5	42	60	60	65	73
6	100	100	90	95	98
7	85	92	57	81	85
8	72	76	57	70	73
9	80	85	57	80	89
10	67	81	44	81	70
11	0	0	0	0	0
12	96	100	94	98	99
13	63	48	41	80	79
14	97	100	89	99	100
15	85	93	79	86	87
16	93	96	71	82	92
17	63	41	47	53	54
18	86	87	80	88	97
19	75	72	54	61	86
20	80	73	59	99	93
21	93	90	60	88	95
22	84	72	64	82	85
23	98	87	82	98	91
24	98	99	89	97	98
25	38	46	19	50	56
26	68	74	59	80	86
27	77	80	64	80	90
28	72	73	52	60	80
29	87	98	95	94	99
30	78	85	51	72	98
31	60	63	43	65	67

TABLE 3

RAW DATA FOR INVISIBLE ZIPPER DEMONSTRATION

Subject No.	Judge No. 1	Judge No. 2	Judge No. 3	Judge No. 4	Judge No. 5
1	100	100	96	98	93
2	97	99	99	95	92
3	98	99	90	98	88
4	98	92	94	94	84
5	0	0	0	0	0
6	90	100	94	98	87
7	100	84	92	83	91
8	85	65	66	70	72
9	0	0	0	0	0
10	98	95	92	95	85
11	60	55	57	45	56
12	83	83	62	71	65
13	92	88	94	94	85
14	96	98	81	97	82
15	88	75	63	83	82
16	100	99	95	92	94
17	90	81	70	86	61
18	91	90	71	85	90
19	0	0	0	0	0
20	98	89	88	88	98
21	83	75	75	76	83
22	95	85	78	71	78
23	100	97	92	97	91
24	100	99	93	81	93
25	70	75	63	70	70
26	78	86	55	78	79
27	78	67	68	71	69
28	79	86	75	78	67
29	100	100	91	99	93
30	77	71	65	69	76
31	76	47	35	78	44

TABLE 4

RAW DATA FOR BUTTONHOLE DEMONSTRATION

Subject No.	Judge No. 1	Judge No. 2	Judge No. 3	Judge No. 4	Judge No. 5
1	99	84	61	98	83
2	97	85	75	96	9C
3	79	53	64	75	79
4	86	79	71	94	80
5	0	0	0	0	0
6	7	2	6	6	10
7	69	30	60	60	77
8	90	62	54	85	86
9	95	78	63	79	77
10	27	16	25	20	34
11	76	63	78	59	77
12	98	97	99	92	95
13	84	76	86	89	86
14	96	96	86	99	94
15	75	84	47	72	78
16	95	91	83	94	93
17	85	33	57	84	85
18	98	94	99	98	93
19	74	61	46	63	76
20	90	51	54	63	85
21	81	19	77	56	81
22	70	47	63	63	72
23	88	47	49	66	58
24	96	93	97	83	95
25	40	25	37	41	40
26	99	100	92	91	93
27	92	81	74	97	87
28	80	54	67	85	69
29	92	81	71	97	95
30	79	83	78	93	86
31	0	0	0	0	0

TABLE 5

RAW DATA FOR BELT DEMONSTRATION

Subject No.	Judge No. 1	Judge No. 2	Judge No. 3	Judge No. 4	Judge No. 5
1	98	100	90	98	95
2	98	93	80	95	84
3	0	0	0	0	0
4	98	89	95	97	96
5	85	93	87	97	87
6	97	88	81	100	88
7	73	74	67	85	77
8	68	69	59	70	76
9	0	0	0	0	0
10	85	65	73	68	79
11	83	71	74	90	73
12	100	96	97	95	93
13	97	91	88	91	90
14	100	99	83	98	83
15	86	72	62	80	78
16	92	97	84	93	86
17	0	0	0	0	0
18	98	100	95	99	93
19	69	71	52	70	69
20	88	80	81	89	77
21	63	87	69	60	50
22	61	33	38	58	56
23	87	93	80	95	58
24	98	94	86	99	89
25	93	93	83	94	81
26	88	100	87	90	81
27	79	87	77	86	72
28	80	81	72	89	77
29	0	0	0	0	0
30	89	75	64	90	76
31	68	86	57	64	70

APPENDIX F

RAW DATA, TABULAR FORM BY METHOD

TABLE 6

RAW DATA FOR FACE TO FACE DEMONSTRATION WITH ILLUSTRATIVE MATERIAL

Subject No.	Judge No. 1	Judge No. 2	Judge No. 3	Judge No. 4	Judge No. 5
1	95	85	95	90	100
2	85	86	70	79	79
3	82	69	61	80	79
4	83	81	53	82	88
5	42	60	60	65	73
6	100	100	90	95	98
7	85	92	57	81	85
8	68	69	59	70	76
10	85	65	73	68	79
11	83	71	74	90	73
12	100	96	97	95	93
13	97	91	88	91	90
14	100	99	83	98	83
15	86	72	62	80	78
16	100	99	95	92	94
17	90	81	70	86	61
18	91	90	71	85	90
20	98	89	88	88	98
21	83	75	75	76	83
22	95	85	78	71	78
23	100	97	92	97	91
24	100	99	93	81	93
25	40	25	37	41	40
26	99	100	92	91	93
27	92	81	74	97	87
28	80	54	67	85	69
29	92	81	71	97	95
30	79	83	78	93	86

TABLE 7

RAW DATA FOR FACE TO FACE DEMONSTRATION WITH STUDENT NOTES

Subject No.	Judge No. 1	Judge No. 2	Judge No. 3	Judge No. 4	Judge No. 5
1	98	100	90	98	95
2	98	93	80	95	84
4	98	89	95	97	96
5	85	93	87	97	87
6	97	88	81	100	88
7	73	74	67	85	77
8	72	76	57	70	73
10	67	81	44	81	70
12	96	100	94	98	99
13	63	48	41	80	79
14	97	100	89	99	100
15	85	93	79	86	87
16	95	91	83	94	93
17	85	33	57	84	85
18	98	94	99	98	93
19	74	61	46	63	76
20	90	51	54	63	85
21	81	19	77	56	81
22	70	47	63	63	72
23	88	47	49	66	58
24	96	93	97	83	95
25	70	75	63	70	70
26	78	86	55	78	79
27	78	67	68	71	69
28	79	86	75	78	67
29	100	100	91	99	93
30	77	71	65	69	76
31	76	47	35	78	44

TABLE 8

RAW DATA FOR TELEVISED DEMONSTRATION WITH ILLUSTRATIVE MATERIAL

Subject No.	Judge No. 1	Judge No. 2	Judge No. 3	Judge No. 4	Judge No. 5
1	99	84	61	98	83
2	97	85	75	96	90
3	79	53	64	75	79
4	86	79	71	94	80
6	7	2	6	6	10
7	69	30	60	60	77
8	85	65	66	70	72
10	98	95	92	95	85
11	60	55	57	45	56
12	83	83	62	71	65
13	92	88	94	94	85
14	96	98	81	97	82
15	88	75	63	83	82
16	93	96	71	82	92
17	63	41	47	53	54
18	86	87	80	88	97
19	75	72	54	61	86
20	80	73	59	99	93
21	93	90	60	88	95
22	84	72	64	82	85
23	98	87	82	98	91
24	98	99	89	97	98
25	93	93	83	94	81
26	88	100	87	90	81
27	79	87	77	86	72
28	80	81	72	89	77
30	89	75	64	90	76
31	68	86	57	64	70

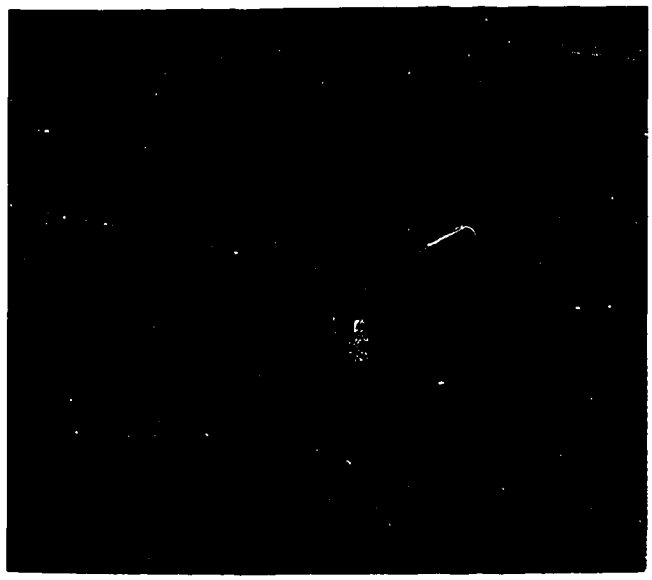
TABLE 9

RAW DATA FOR TELEVISED DEMONSTRATION WITH STUDENT NOTES

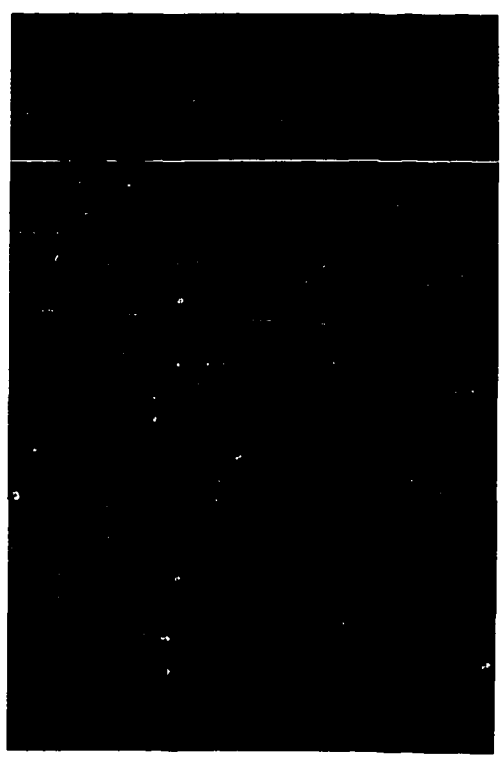
Subject No.	Judge No. 1	Judge No. 2	Judge No. 3	Judge No. 4	Judge No. 5
1	100	100	96	98	93
2	97	99	99	95	92
3	98	99	90	98	88
4	98	92	94	94	84
6	90	100	94	98	87
7	100	84	92	83	91
8	90	62	54	85	86
10	27	16	21	20	34
11	76	63	78	59	77
12	98	97	99	92	95
13	84	76	86	89	86
14	96	96	86	99	94
15	75	84	47	72	78
16	92	97	84	93	86
18	98	100	95	99	93
19	69	71	52	70	69
20	88	80	81	89	77
21	63	87	69	60	50
22	61	33	38	58	56
23	87	93	80	95	58
24	98	94	86	99	89
25	38	46	19	50	56
26	68	74	59	80	86
27	77	80	64	80	90
28	72	73	52	60	80
29	87	98	95	94	99
30	78	85	51	72	98
31	60	63	43	65	67

APPENDIX G

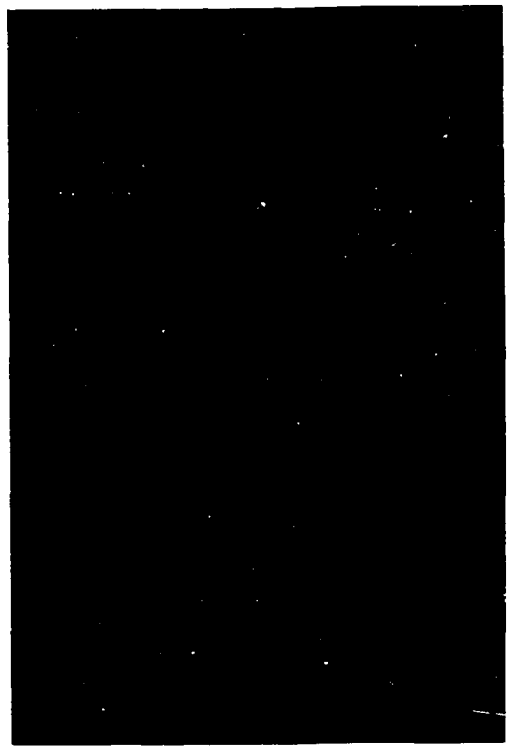
PHOTOGRAPHS OF STUDENT PROJECTS



Student Product No. 1, Neckline Facing



Student Product No. 2, Invisible Zipper



Student Product No. 3, Bound Buttonhole

Student Product No. 4, Belt