THE UNIVERSITY OF CALGARY

The Effects of Pace of TV News Stories

on Viewers of Different Ages

by

.

Albertus R. Leemburg

.

# A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS

GRADUATE PROGRAMME IN COMMUNICATIONS STUDIES

.

CALGARY, ALBERTA

AUGUST, 1993

© Albertus R. Leemburg 1993

,



National Library of Canada

Acquisitions and Bibliographic Services Branch

395 Wellington Street Ottawa, Ontario K1A 0N4 Bibliothèque nationale du Canada

Direction des acquisitions et des services bibliographiques

395, rue Wellington Ottawa (Ontario) K1A 0N4

Your file Votre référence

Our file Notre référence

The author has granted an irrevocable non-exclusive licence allowing the National Library of Canada to reproduce, loan. sell distribute or copies of his/her thesis by any means and in any form or format, making this thesis available to interested persons.

L'auteur a accordé une licence irrévocable et non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de sa thèse de quelque manière et sous quelque forme que ce soit pour mettre des exemplaires de cette thèse à disposition la des personnes intéressées.

The author retains ownership of the copyright in his/her thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without his/her permission. L'auteur conserve la propriété du droit d'auteur qui protège sa thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

ISBN 0-315-88561-0



Name

Leemburg

Dissertation Abstracts International is arranged by broad, general subject categories. Please select the one subject which most nearly describes the content of your dissertation. Enter the corresponding four-digit code in the spaces provided.

SUBJECT TERM

3 0 SUBJECT CODE

# Subject Categories

# THE HUMANITIES AND SOCIAL SCIENCES

### COMMUNICATIONS AND THE ARTS

Architecture	0/25
Art History	0377
Cinema	0900
Dance	0378
Fine Arts	0357
Information Science	0723
Journalism	0391
Library Science	0399
Mass Communications	0708
Music	0413
Speech Communication	0459
Theater	0464

#### **EDUCATION**

General	05	15
Administration	051	4
Adult and Continuing	051	16
Aaricultural	051	17
Art	027	73
Bilingual and Multicultural	028	32
Business	068	38
Community College	027	75
Curriculum and Instruction	072	27
Early Childhood	051	8
Elementary	052	24
Finance	027	77
Guidance and Counseling	05	19
Health	068	30
Higher	074	45
History of	.052	20
Home Economics	027	78
Industrial	05:	21
Language and Literature	027	79
Mathematics	028	30
Music	052	22
Philosophy of	099	78
Physical	.05:	23

# Psychology ..... Reading 0535 Religious 0527 Sciences 0714 0533 Vocational ......0747

#### LANGUAGE, LITERATURE AND LINGUISTIĆS

Language	
General	0679
Ancient	0289
Linguistics	0290
Modern	029
Literature	
General	0/01
Classical	
Comparativo	
Adadiourd	027
	027/
Modern	0290
Atrican	0310
American	059
Asian	0303
Canadian (English)	0352
Canadian (French)	0355
English	0593
Germanic	0311
Latin American	0312
Middle Eastern	031
Romance	031
Slavic and Fast European	
orang ang casi coropean	

# PHILOSOPHY, RELIGION AND

IHEOLOGY	
Philosophy	.0422
Religion	
General	.0318
Biblical Studies	.0321
Clergy	.0319
History of	.0320
Philosophy of	.0322
Theology	.0469
SOCIAL SCIENCES	
American Studios	0333
Anthropology	.0323
Archgeology	0324
Cultural	0324
Physical	0327
Business Administration	.002/
General	0310
Accounting	0272
Banking	0770
Management	0454
Marketina	0338
Canadian Studies	0385
Economics	
General	.0501
Aaricultural	.0503
Commerce-Business	.0505
Finance	.0508
History	.0509
Labor'	.0510
Theory	.0511
Folklore	.0358
Geography	.0366
Gerontology	.0351
History	
General	.0578

Ancient	0570
Medieval	0581
Modern	0582
	0502
Black	0328
African	0221
Autour	0331
Asia, Australia and Oceania	0332
Canadian	022T
	0334
European	0335
Latin American	0222
Lann American	0330
Middle Eastern	0333
I balta al Chatas	0007
United States	033/
listory of Science	0585
	0000
aw	0398
Political Science	
	0/10
General	0615
International Law and	
	"
Relations	0616
Public Administration	0617
lecreation	.0814
Castal Mark	0152
	0452
ociology	
Conoral	0424
General	0020
Criminology and Penology	0627
Demonstration of the second of the	0020
Demography	.0730
Ethnic and Racial Studies	.0631
In alt state of a seal Gaussile.	
individual and ramily	
Studies	0628
to develop and taken	
inaușiriai ana Labor	
Relations	0629
Dublin and Contal M/alfana	0220
Public and Social Welfare	.0030
Social Structure and	
	0700
Development	0/00
Theory and Methods	0344
ransportation	.0709
Irban and Regional Planning	0000
i san ana ing ing ondi i nanining	· × / / /
Nomen's Studies	.0453

# THE SCIENCES AND ENGINEERING

### **BIOLOGICAL SCIENCES** Agriculture

-	General	0473
	Agronomy	0285
	Animal Culture and	
	Nutrition	0475
	Animal Pathology	0476
	Animal Famology	0470
	rood Science and	0050
	_ lechnology	0359
	Forestry and Wildlife	04/8
	Plant Culture	0479
	Plant Pathology	0480
	Plant Physiology	0817
	Range Management	0777
	Wood Technology	0746
Rio	logy	••
510	General	0306
	Anatami	0207
	Richardinking	0207
	Diosidiistics	0300
	Borany	0309
	Cell	03/9
	Ecology	0329
	Entomology	0353
	Genetics	0369
	Limnology	0793
	Microbiology	0410
	Molecular	0307
	Neuroscience	0317
	Ocognography	0416
	Discretation of the second sec	0410
	Providentiation	0433
	Radiation	0921
	Veterinary Science	0//8
	Zoology	04/2
Bio	physics	
	General	0786
	Medical	0760
	•	

# **EARTH SCIENCES**

Biogeochemis	try	0425
Googhamistor	· -	<b>V00V</b>
Ocochemisny		0770

# 0370 Geodesy 0370 Geology 0372 Geophysics 0373 Hydrology 0388 Mineralogy 0411 Paleobotany 0345 Paleocology 0426 Paleocology 0418 Paleozoology 0485 Paleozoology 0485 Geodesy .....

# HEALTH AND ENVIRONMENTAL

SCIENCES	
Environmental Sciences	.0768
Health Sciences	
General	.0566
Audiology	.0300
Chemotherapy	0992
Dentistry	.0567
Education	.0350
Hospital Management	.0/69
Human Development	.0/58
Immunology	.0982
Medicine and Surgery	.0304
	.0347
Nursing	0570
Obstatzics and Gunasology	0320
Occupational Health and	.0300
Therapy	0354
Ophthalmology	0381
Pathology	0571
Pharmacology	.0419
Pharmacy	.0572
Physical Therapy	.0382
Public Health	.0573
Radiology	.0574
Recreation	.0575

# 

# PHYSICAL SCIENCES

# **Pure Sciences**

F

Chamistry	
Chemistry	0405
General	0465
Agricuitural	0/49
Analytical	0486
Biochemistry	048/
Inorganic	0488
Nuclear	0738
Organic	.0490
Pharmaceutical	.0491
Physical	0494
Polymer	0495
Radiation	0754
Mathematics	0405
Physics	0.000
General	0605
	7860
Astronomy and	0700
Astronomy and	0404
Asirophysics	0000
Almospheric Science	0740
Flashessies and Flasheitte	0/40
Electronics and Electricity	0607
Elementary Particles and	0700
Fligh Energy	0798
Fluid and Plasma	0/59
Molecular	0609
Nuclear	0610
Optics	0752
Radiation	0756
Solid State	.0611
Statistics	.0463
Analtad Catanana	
Applied sciences	~~ ~ ~
Applied Mechanics	0346
Computer Science	.0984

Engineering	
General	.0537
Aerospace	.0538
Aaricultural	0539
Automotive	.0540
Biomedical	0541
Chemical	0542
Civil	0543
Electronics and Electrical	0544
Heat and Thermodynamics	0348
Hydraulic	0545
Industrial	0546
Marine	.0547
Materials Science	0794
Mechanical	0548
Metalluray	0743
Mining	.0551
Nuclear	0552
Packaging	0549
Petroleum	0765
Sanitary and Municipal	0554
System Science	0790
Geotechnology	0428
Operations Research	0796
Plastics Technology	0795
Textile Technology	0994
round rocanology	

# PSYCHOLOGY

General	0621
Behavioral	0384
Clinical	0622
Developmental	0620
Experimental	0623
Industrial	0624
Personality	0625
Physiological	0989
Psychobiology	0349
Psychometrics	0632
Social	0451

Dissertation Abstracts International est organisé en catégories de sujets. Veuillez s.v.p. choisir le sujet qui décrit le mieux votre thèse et inscrivez le code numérique approprié dans l'espace réservé ci-dessous.

SUJET

CODE DE SUJET

0579

Ancienne

# Catégories par sujets

# HUMANITÉS ET SCIENCES SOCIALES

Lecture ...

### **COMMUNICATIONS ET LES ARTS**

Architecture	0729
Beaux-arts	0357
Bibliothéconomie	0399
Cinéma	0900
Communication verbale	0459
Communications	0708
Danse	0378
Histoire de l'art	0377
Journalisme	0391
Musique	0413
Sciences de l'information	0723
Théâtre	0465

# ÉDUCATION

Generalites	313	,
Administration	.0514	t
Art	.0273	3
Collèges communautaires	.0275	5
Commerce	.0688	3
Économie domestique	0278	ł
Éducation permanente	0516	Ś
Éducation préscolaire	0518	ŝ
Éducation sanitaire	0680	)
Enseignement garicole	0517	7
Enseignement bilingue et		
multiculturel	0282	,
Enseignement industriel	0521	ŕ
Enseignement primaire	052/	1
Enseignement professionnel	0747	ż
Enseignement religioux	0527	7
Enseignement rengieux	0527	,
Enseignement secondaire	0533	?
Enseignement special	0327	-
Enseignement superieur	0/40	2
Evaluation	0288	5
Finances	.02//	ί.
Formation des enseignants	.0530	)
Histoire de l'éducation	.0520	2
Langues et littérature	.0275	,

# 0535 Physique ..... Programmes d'études et .0523 Programmes d'études et enseignement 0727 Psychologie 0525 Sciences 0714 Sciences sociales 0534 Sociologie de l'éducation 0340 Technologie 0710

#### LANGUE, LITTÉRATURE ET LINGUISTIQUE La

Langues	
Généralités	0679
Anciennes	0289
Linguistique	0290
Modernes	0291
Littérature	
Généralités	0401
Anciennes	0294
Comparée	0295
Mediévale	0297
Moderne	0298
Africaine	0316
Américaine	0591
Analaisa	0503
Arigidise	0305
Canadianna (Analaisa)	0303
Canadienne (Anglaise)	0332
Canadienne (Française)	0355
Germanique	0311
Latino-americaine	0312
Moyen-orientale	0315
Romane	0313
Slave et est-européenne	0314
•	

# PHILOSOPHIE, RELIGION ET

Philosophie	0422
Religion	0318
Çlergé	0319
Etudes bibliques Histoire des religions	0321
Philosophie de la religion	0322
Théologie	0469

# SCIENCES SOCIALES

Anthropologie	
Archéologie	0324
Culturalla	0324
	0320
Physique	0327
Droit	0398
Economie	
Généralités	0501
Commerce-Affaires	0505
Économie garicole	0503
Économie du travail	0510
Eingnoos	0508
Listaire	0500
This offe	0507
ineorie	0511
Etudes americaines	0323
Etudes canadiennes	0385
Etudes téministes	0453
Folklore	0358
Géographie	0366
Gérontologie	0351
Castion dot affairer	0001
Cénémetries .	0210
Generalites	0310
Administration	0454
Banques	0770
Comptabilité	0272
Marketina	0338
Histoire	
Histoire générale	0578

# Africaine ..... Canadienne ..... 0331 0334 États-Unis ..... 0337 Européenne Moyen-orientale Latino-américaine Asie, Australie et Océanie Histoire des sciences 0335 0333 0336 0332 0585

# SCIENCES ET INGÉNIERIE

# SCIENCES BIOLOGIQUES Agriculture

Generalies	
Aaronomie.	02
Alimentation et technologie	
alimentaire	03
	, 03,
<u>Culture</u>	04
Elevage et alimentation	04
Exploitation des péturages	077
Pathologie animale	04
Pathologio végétalo	04
Dissistant and the second second	
Physiologie vegerale	
Sylviculture et toune	04/
Technologie du bois	074
Biologie	
Généralités	030
Angtomio	
Piala de Cratiationes	
Piologie (Statistiques)	030
Biologie moléculaire	030
Botanique	. 030
Cellule	032
Écologie	03
Entemologio	. 03
Cinciliana Cinciliana	
Generique	
Limnologie	
Microbiologie	.04
Neurologie	.03
Océanographie	04
Physiologie	04
Dediction	
Radiation	
Science veterinaire	
Loologie	
Biophysique	
'Généralités	078
Medicale	07

Generalites	
Agronomie.	0285
Alimentation et technologie	
alimentaire	, 0359
Culture	0479
Elevage et alimentation	0475
Exploitation des péturages .	0777
Pathologie animale	0476
Pathologie végétale	0480
Physiologie végétale	0817
Sylviculture et faune	.0478
Technologie du bois	0746
Biologie	
Généralités	0306
Anatomie	0287
Biologie (Statistiques)	0308
Biologie moléculaire	0307
Botanique	0309
Çellule	.0379
Ecologie	0329
Entomologie	0353
Génétique	.0369
Limnologie	.0793
Microbiologie	.0410
Neurologie	0317
Océanographie	
Physiologie	0433
Radiation	
Science vétérinaire	0778
Zoologie	0472
Biophysique	
Généralités	
Medicale	
SCIENCES DE LA TERRE	
ACIENCES NE DA LEVUE	

# 

### SCIENCES DE LA SANTÉ ET DE L'ENVIRONNEMENT

Économie domestique Sciences de l'environnement	.0380 .0768
Généralités Administration des hipitaux Alimentation et nutrition	.0566
Audiologie Chimiothérapie Dentisterie Développement humain	.0300
Enseignement Immunologie Loisirs	.0350
Médecine du travail et thérapie Médecine et chirurgie	.0354
Obstétrique et gynécologie Ophtalmologie Orthophonie	.0380 .0381 .0460
Pathologie Pharmacie Pharmacologie	.05/1
Radiologie Santé mentale Santé publique	.0382 .0574 .0347
Soins infirmiers Toxicologie	.0569

# SCIENCES PHYSIQUES

Sciences Pures
Chimie
Genéralités0485
Biochimie
Chimie aaricole0749
Chimie analytique0486
Chimie minérale0488
Chimie nucléaire0738
Chimie organique0490
Chimie pharmaceutique 0491
Physique0494
PolymCres
Radiation
Mathématiques0405
Physique
Gènéralités0605
Acoustique
Astronomie et
astrophysique
Electronique et électricité 0607
Fluides et plasma0759
Météorologie0608
Optique
Particules (Physique
nucléaire)0798
Physique atomique
Physique de l'état solide 0611
Physique moléculaire
Physique nucléaire0610
Radiation
Statistiques0463
Sciences Appliqués Et
Technologia

4
-
6
ő

Biomédicale	.0541
Chaleur et ther	
modynamique	.0348
Conditionnement	
(Emballage)	.0549
Génie aérospatial	. 0538
Génie chimique	0542
Génie civil	0543
Génie électronique et	
électrique	0544
Génie industriel	0546
Genie mecanique	0548
Genie nucleaire	
Ingenierie des systames	
Mecanique navale	.034/
Science des matérieurs	0704
Tachnique du nétrolo	0745
Technique minière	0551
Techniques sonitaires et	
municipales	0554
Technologie hydraulique	0545
Mécanique appliquée	0346
Géotechnologie	.0428
Matières plastiques	
(Technologie)	.0795
Recherche opérationnelle	.0796
Textiles et tissus (Technologie)	.0794
DEVELIDIOCIE	
	0/01
Generalites	UOZI

Généralités	0621
Personnalité	0625
sychobiologie	0349
sychologie clinique	0622
sychologie du comportement	0384
sychologie du développement	0620
sychologie expérimentale	0623
sychologie industrielle	0624
sychologie physiologique	0989
sýchologie sociale	0451
sychométrie	0632
•	

F

# THE UNIVERSITY OF CALGARY

# FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "The Effects of Pace of TV News Stories on Viewers of Different Ages" submitted by Albertus R. Leemburg in partial fulfillment of the requirements for the degree of Master of Arts.

Edna F. Gimedal

Supervisor, Dr. E. F. Einsiedel Graduate Programme in Communications Studies

Dr. G. T. Fouts Department of Psychology

Dr. R. Sept Graduate Programme in Communications Studies

estenhe 17, 1993

# ABSTRACT

This study examined visual pacing of TV news stories and its effect on viewers' enjoyment and learning. One hundred and sixteen people from two age groups, younger (18 - 39) and older (50 -74) adults participated.

Two news stories were altered to obtain 3 rates of presentation (time extended, normal, and time-compressed), and participants were divided into 6 subgroups (controlling for order of presentation). Each participant viewed two stories, each at a different pace.

The effect of observing two news stories was assessed using a questionnaire after viewing each program.

This study found that time-compression of TV news stories was not subtle, and interfered with learning and enjoyment of the programs.

Findings were discussed in terms of differences between age groups. Limitations, implications and suggestions for future research are also presented.

# ACKNOWLEDGEMENTS

I would like to express my sincerest appreciation to my thesis committee Dr. E. F. Einsiedel, Dr. G. T. Fouts and Dr. R. Sept for their helpful suggestions and constructive comments in the completion of this thesis.

Special thanks is also extended to Dr. T. Fung for his assistance in developing the research design for this study.

I am also extremely grateful to Gerry Corraini for his assistence in producing the necessary graphs for this thesis.

And finally, I am extending my warmest thanks to my best friend, Evelyn, whose understanding and moral support provided the inner strength to complete this project. DEDICATION

To the memory of Linda R. Hodges-Zwerman

.

.

•

# TABLE OF CONTENTS

APPROVAL PAGE	ii
ABSTRACTi.	ii
ACKNOWLEDGEMENTS	iv
DEDICATION	v
TABLE OF CONTENTS	vi
LIST OF TABLES	x
LIST OF FIGURES xi.	ii
INTRODUCTION	1
Purpose	7
Conceptual Frameworks	8
Pacing as a Formal Feature	13
Pacing of Visual Information and Aging Viewers	16
Design of Study	19
Hypothesis	19
Rationale	20
METHOD	21
Subjects and Design	21
Stimulus Materials	22
Development of Stimulus Materials	25
Assessment Instruments	27
Demographic Information	27
T.V. Viewing Information	27
Enjoyability Response	28
Formal Feature Evaluation	28

Learning Information	29					
Procedure	30					
Practice	31					
Data Scoring	33					
Direct Data Scoring	33					
RESULTS						
Reliability of Data Scoring and Coding	34					
Participant Demographics and Media Use	34					
Statistical Analyses	37					
Analysis of Formal Features	37					
Pictures appear in a natural progression	38					
Pace or speed of the pictures changed too slowly	41					
Picture changes (edits) were smooth	43					
Presented too quickly to absorb content	46					
Pictures meaningfully illustrated content	48					
Picture changes (edits) were too abrupt	50					
Pictures changed too rapidly	52					
Pictures were too busy or complex	56					
Photographed in bolder detail (up closer)	58					
Presented too slowly to absorb content	60					
Analysis of Enjoyability	66					
Analysis of Learning	68					
Total learning	68					
Learning of information orally presented	70					
Learning of information orally and visually presented	72					
Subsidiary Analysis	75					

. .

Enjoyability of Programs					
Learning	77				
DISCUSSION					
Interpretations of Results	80				
Total Enjoyability	82				
Learning of information	85				
Total Learning	85				
Learning of orally presented information	88				
Learning of orally and visually presented information	89				
Formal Features	90				
The pictures appeared in a natural progression	92				
The pace or speed of pictures changed too rapidly for my					
taste; the pace or speed of pictures changed too slowly					
for my taste	93				
The picture changes (edits) were so smooth I was unaware					
of these changes; the pictures changes (edits) were too					
abrupt for my comfort	93				
The pictures meaningfully served to illustrate the content	t				
of the report	94				
The news story was presented too quickly to absorb the					
content; this news story was presented too slowly to					
absorb the content	95				
The pictures were too busy or complex to be fully					
understood; some items should have been photographed					
in bolder detail (up closer)	96				
Limitations of the present study					

	Reactive and active theories
	Social - cultural context
	Materials
	Representativeness of sample 100
	TV viewing setting 100
Sugges	stions for future research 101
Implic	cations for the TV industry 103
REFERENCES .	
APPENDIX A:	TV News story program description - "Working in the 90's: Friends of the Family" 114
APPENDIX B:	TV News story program description - "Working in the 90's: SAIT II"
APPENDIX C:	Subject consent form and questionnaire

 $\mathbf{i}$ 

# LIST OF TABLES

.

.

<u>Table</u>	Title	<u>Page</u>
Table 1	Participant Demographics (N-116)	36
Table 2	Formal feature question: The pictures appeared IN A NATURAL PROGRESSION; the analyses and means	39
Table 3	Formal feature question: The pace or speed of the pictures changed <u>TOO_SLOWLY</u> for my taste; the analyses and means	42
Table 4	Formal feature question: The picture changes (edits) <u>WERE SO SMOOTH</u> that I was unaware of these changes; the analyses and means	44
Table 5	Formal feature question: The news story was presented <u>TOO QUICKLY</u> to absorb the content; the analyses and means	47
Table 6	Formal feature question: The pictures <u>MEANINGFULLY</u> <u>SERVED TO ILLUSTRATE</u> the content of the report; the analyses and means	49

х

- Table 7 Formal feature question: The picture changes (edits) were TOO ABRUPT for my comfort; the analyses and means
- Table 8 Formal feature question: The pace or speed of the pictures TOO RAPID for my taste; the analyses and means 53
- Table 9 Formal feature question: The pictures WERE TOO BUSY OR COMPLEX to be fully understood; the analyses and means
- Table 10 Formal feature question: Some items should have been photographed in <u>BOLDER</u> detail (<u>UP CLOSER</u>); the analyses and means
- Table 11 Formal feature question: The news story was presented TOO SLOWLY to absorb the content; the analyses and means 61
- Table 12 TOTAL ENJOYABILITY; the analyses and means 67
- Table 13 TOTAL INFORMATION learned; the analyses and means 69
- Table 14 Learning of information ORALLY presented; the analyses and means 71

51

#### 57

59

Table 15Learning of information ORALLY AND VISUALLY<br/>presented; the analyses and means73Table 16Correlations between education level and total<br/>enjoyability of program, calculated separately<br/>for each pace condition76Table 17Correlations between educational level and total<br/>learning, calculated separately for each pace<br/>condition78

```
Table 18Summary of Analyses81
```

# LIST OF FIGURES

.

•

<u>Figure</u>		Title	<u>Page</u>
Figure	1	A schematic diagram of the reactive theory of television viewing (Anderson & Lorch, 1983, p. 4)	9
Figure	2	An integrated model of perception, adapted from Neisser's (1976) spiral model of perception and consolidated with Salomon's (1987) theory	12
Figure	3	Graphic presentation of the Hypothesis	20
Figure	4	Sub-group age distribution	22
Figure	5	Description of the two news stories in terms of scenes, contents and lengths	24
Figure	6	Sub-group controlling for order of presentation of the three paces of visual presentation	33
Figure	7	Formal feature question regarding pictures appearing in a natural progression, under normal and time-extended conditions	40

- Figure 8 Formal feature question regarding picture changes as being smooth, under time-compressed and normal conditions 45
- Figure 9 Formal feature question regarding pictures changing too rapidly, under time-compressed and normal conditions 55
- Figure 10 Formal feature question regarding the story being presented too slowly to absorb content, under time-extended and normal conditions

.

- Figure 11 Formal feature questions regarding the story being presented too slowly to absorb content, under time-compressed and normal conditions
- Figure 12 Formal feature questions regarding the story being presented too slowly to absorb content, under time-extended and time-compressed conditions

65

62

63

xiv

# INTRODUCTION

Television news is one of the most compelling ways for people to obtain information about their community, country and world (Robinson, 1971; ABC-TV, 1993; BBM, 1993; Nielson, 1993). Television rating agencies indicate that millions of TV viewers watch news broadcasts daily, and TV surveys and marketing analyses show that the main target for TV viewers is the bulge of the population, the Baby Boomers, the seven million Canadians born between 1946 and 1967.

Demographic studies reveal that an age shift is occurring in the television audience in North America; a major portion of viewers is moving into the pre-"young-old" (55-65 years) age category (Neugarten & Dolan, 1973). This cohort is one of the fastest growing age groups in Canada (Wigdor & Foot, 1988); and perhaps more significant is its potential as a TV viewing audience; the 50-plus group represents one-third of the population (Statistics Canada, 1987). If the TV industry wishes to maintain its high viewership and to optimize television viewing pleasure, it should seek to discover how best to fulfill the needs and abilities of its changing audience. One of the age-related changes is the rate of visual presentation which may influence the selection of programs and enjoyment by older viewers. The purpose of this study was to determine the effects of watching news or informational programs varying in rate or pace of presentation on viewers of different ages.

There are several reasons why the presentation of TV news should be examined with respect to the aging of the viewing audience. First, the changing demographics in Canada indicate a dramatic increase in age or the "greying" of the population. The significant aging of the overall population (Stone & Franken, 1988; Ward, 1984) reveals that Canada's population aged 65 and over (10.7 per cent in 1988) has grown at a rate of increase more than twice that of the population as a whole (Statistics Canada, 1987). This steadfast increase of older TV viewers will accelerate even more rapidly in the future. A major portion of Canadians now form the Baby Boom generation who will start to reach the lifespan phase of pre-retirement age in the year 2001 (Stone & Frenken, 1988). By the year 2021, when all the baby boomers are 65 and over, more than 21 per cent of Canada's population will be "young old" or older (Wigdor & Foot, 1988). As this shift in the demographics of Canada begins to unfold, this large group of adults will first enter the pre "young-old" (55-64 year) age category (Lazer, 1986), thus significantly influencing the demographics of the TV viewing audience. The 50-plus age group already has over half of the estimated \$30 billion in total annual disposable income in Canada and approximately \$7 billion preserved in registered retirement savings plans (The Calgary Herald, 1993). This growing middle class of seniors will increasingly become a formidable market segment which cannot be ignored. Marketers of products and services aimed at aging consumers will increasingly be searching for TV programs that can deliver audiences for their advertising messages (The Calgary Herald, 1993). This symbiotic partnership, the TV industry and its sponsors, will gradually have to carefully redefine its products and services, as well as its TV programs to meet the changing demands and requirements of an aging society.

Second, as the Baby Boomers start to reach age 55, many will retire early (Wigdor & Foot, 1988) or make major changes in their lifestyles, resulting in increased amounts of free time. As a consequence, the use of TV will likely increase (Cassata, 1967), for example, as a way to fill time, as a method of seeking information, and as a means of varying one's sources of inexpensive entertainment (Rubin & Rubin, 1982). Especially important is the phenomenon of information-seeking, which will likely dramatically increase (Dimmick, 1979; Phillips & Sternthal, 1977; Bower, 1973; Chaffee & Wilson, 1975; Comstock, Chaffee, Katzman, McCombs & Roberts, 1978; Davis, Edwards, Bartel & Martin, 1976; Korzenny & Neuendorf, 1980). Numerous studies have documented that older viewers already have a preference for news and informational programming (Rubin & Rubin, 1982; Hasselquest, 1992; Fouts, 1989; Goodman, 1990); and with the aging of the viewing public, the overall use of television and newswatching is particularly likely to continue to increase (Fouts, 1989), with reading decreasing (Chaffee & Wilson, 1975; Hasselquest, 1992).

Third, with the increasing age of the TV audience, it is also expected that there will be a shift from a combination of media-seeking and content-seeking to mostly content-seeking, with information-seeking peaking during the years prior to retirement (Dimmick, et al., 1979). The first wave of Baby Boomers, those born in the late 1940's, will start reaching this period of their lives in less than a decade. Perhaps anticipating these changing viewer tastes and demands, information programming has already begun to dramatically increase. In Calgary, for example, local and regional television newscasts have more than doubled over the past twenty years (BBM Surveys, 1986; Nielson, A.C., 1986). The launching of CBC's "Newsworld" on July 31, 1989, added yet another major source of television news to satisfy viewers' increasing appetite for information programming. Furthermore, the recent influx of more cable TV channels has provided still more opportunities to view news and information-type programming; e.g., the CNN Cable News Network, the Headline News channel, and the Learning Channel all illustrate a growing viewer penchant for information (<u>TV Guide</u>, 1993).

Fourth, studies have shown an increasing incidence of sensory defects with aging (Galton, 1885; Birren & Clayton, 1975), especially hearing and visual acuity declines (Chaffee & Wilson, 1975; Zitter, 1990; Kausler, 1982) as well as a deterioration of the efficiency of the central nervous system (Birren, 1974; Zitter, 1990). The implications of these age-related changes for the use of television's formal features is very significant for the TV industry. The term formal features was coined by social scientists to isolate television's production techniques such as pacing, editing, camera movement and audio effects distinct from program content (Bryant & Anderson, 1983). It is assumed that the formal feature of visual flow or rate of presentation may influence the use of TV for aging viewers, especially their enjoyment and learning associated with watching news stories. That is, the rate at which older viewers can process visual information must coincide with the pace of programs in order to fall within the comfort-zone associated with the cerebral processing characteristics of the audience.

Fifth, the TV industry has, in the past, largely ignored this unique segment of the population and can no longer afford to do so. For example, based on 1986 data from the two major television marketing analysts (A.C. Nielson Company and the Bureau of Broadcast Measurement), anyone over the age of 54 in Canada was not statistically segmented (BBM, Fall 1986; A.C. Nielson, March 1986), but rather, grouped within the very old and elderly segments of the population. It appears as if the grey market is perceived as still too small in Canada to warrant segmentation (Dorion, 1993). Locally, a Calgary Market Profile (an unpublished TV market survey by Calgary Database Consumer Groups) lumps everyone over the age of 55 into one homogeneous group, thus also neglecting the increasingly important issue of market segmentation within this group (CMP, 1989). However, research in gerontology and evidence of age differences in information processing provides considerable evidence that this 55-plus age group is not homogeneous (Phillips & Sternthal, 1977), thus having many implications for the TV broadcasting industry with respect to audience segmentation and targeting.

Sixth, new technology has been responsible for changing the communication pattern of society (McQuail, 1975). The decrease in newspaper reading (Robinson, 1981) and the unprecedented increase in viewing television news by society can directly be traced to technological developments. Due to technical innovations within the medium of television, there is an increasing use of time-distortion or time-altering of programs and commercials. It is known that this can have an effect on children (Fouts & Flessati, 1983), and due to the age-related changes in aging, will likely have an effect on older viewers.

Advertisers appeared keenly interested in condensing information so that more material could be presented in a shorter time period (MacLachlan & La Barbera, 1978). Other producers too, especially those involved in sports presentations have experimented with time-altering devices (Zettl, 1984). The electronic innovations, such as the transistors in place of tubes and smaller helical-scan instead of quadruplex videotape recorders helped make these time-altering effects possible. The increased demand for more versatility, including developing ways to change pacing, was partly responsible for major transformations in the way images and sound were created.

Seventh, in the mid-1970's, an electronic revolution took place as important as the advent of colour television (Burrows, Wood, & Gross, 1989). This new technology was "electronic news-gathering," in which the use of 16mm film in TV news was replaced by small electronic cameras and video-editing equipment, which revolutionized and expanded the workplace of the television news-room. The development of the Minicam was partly due to research and development related to the space program (Stone & Hinson, 1978). It contributed to the rapid demise of "Newsfilm," the predominant means of capturing news visuals. It not only transformed the tools within the TV industry, but also the demographics of the professionals working within it. This proliferation of portable electronic recording and editing devices, therefore, created a great demand for new professionals. The newly trained journalists were younger and appeared better and differently educated (Yoakum & Cremer, 1989). Thus, a new breed of editors evolved, not steeped in the time-proven tradition of editing film, but trained quickly for a demanding workplace. It was now a group of younger and dissimilar editors who decided just how long every shot would remain on the screen and give the story its definitive pace (visual flow). For example, the rate of visual flow in producing TV news stories is subjectively determined by videotape editors, using dynamic and analytical abilities in an acutely conscious process (Burrows, Wood & Gross, 1989; Yoakam & Cremer, 1989). Thus, the norms for determining visual pacing and the cutting/editing of news stories are most often based upon their own personal information-processing speeds, which

are likely magnified through their highly refined sense of mental acuity. In news editing, the image is left on the screen long enough to make its point and cut at the moment the editor judges that it's made (Reisz & Millar, 1972). Consequently, the mental processing speed of younger newseditors may differ from that of a major portion of the audience, i.e., older adults, which they wish to attract and inform and whose cognitive processing abilities are slower (Kausler, 1982). In other words, the editor may determine to cut at a place before the image has made its point to the older viewer. The combination of artistry and technique in editing (Burder, 1970) follows the taste and creativity of the younger editor and may not necessarily match that of the older viewer. If this discrepancy is not recognized, the likely result may be that viewers will tune out, since the speed of presentation may result in sensory overload (Yoakum & Cremer, 1989), if older viewers' adaptive processes cannot be accommodated. The resulting withdrawal from the medium, and apathy (Toffler, 1970) alienation, or the incomplete understanding and dissatisfaction with the medium (Rydin, 1983) may have considerable economic ramifications for the TV industry. Thus, a key question for those developing news programs is whether they know their viewers, are sensitive to their needs and abilities, and recognize that these change significantly with age.

## Purpose

The purpose of this study was to explore and gain a better understanding of the impact of one aspect of program form, the rate or visual pace of presentation of TV news-stories on television viewers of different ages. More specifically, the purposes were (1) to assess the effects of faster-than-normal and slower-than-normal paces of TV news stories on viewers' enjoyment and learning of contents, and (2) to determine whether such effects are related to the age of viewers.

The remainder of this introduction will present (a) a review of the two conceptual frameworks used, the active and reactive theories, as conceptualizations for this research, (b) a discussion of visual pacing as one of TV's formal features, (c) an examination of pace in the context of aging TV viewers, and (d) an outline of the design of the study and its hypothesis.

# Conceptual Frameworks

Two conceptual frameworks exist within the paradigms of effects pertaining to television viewing, the "active" and the "reactive". The first, active framework, postulates that visual attention is actively under the control of the viewer as part of a mental schema (Graesser, Higginbotham, Robertson & Smith, 1978; Pichert & Anderson, 1977; Schank & Abelson, 1977; Anderson & Lorch, 1983). This conceptualization implies that the viewer does not merely react involuntarily to TV programs' formal features (Anderson & Lorch, 1983). Instead, the viewer actively engages in some mental activity in order to control incoming program content using processes such as interpretation, comparison, information storage, as well as utilizing other personal cognitive attributes to filter content. Research based on this approach has been criticized in two ways. First, the active theory is mostly confined to effects related to young children's use of television programs and is limited to only five studies. The active framework may, therefore, have little or no significant

8

relevance when applied to adult TV viewers. Second, this research has not withstood the judicious scrutiny of time since the initial proposal of active conceptualization in 1979 (Krull & Husson, 1983). Considerably more evidence needs to be presented in order to confirm the validity of this approach, particularly when applied to TV viewers of different age groups. Furthermore, this framework appears to discount or diminish any potential effect that TV's formal features which may contribute to viewers' attentive behaviour and runs counter to most television and film production theory (Yoakam & Cremer, 1989; Manvell, 1955; Reisz & Millar, 1972; Burrows, Wood & Gross, 1992).

The second framework is the reactive conceptualization (see Figure 1), which assumes that visual attention to television is maintained, in part, by its structured formal features (Singer, 1980; Winn, 1970; Lesser 1977; Mander, 1978).



# Figure 1. A schematic diagram of the reactive theory of television viewing (Anderson & Lorch, 1983, p. 4).

The reactive theory was fundamentally and scientifically studied by some of the greatest early silent film directors of Russia, and can be perceived as a more pure form of visual analysis, since at that early stage of film-making, sound was not a potential detracting element. Thus, visual features were exclusively and extensively analyzed and formal features such as pacing, rhythm, cutting, and the juxtapositioning of images with its effects upon their audience were equated to the syntax of language and even compared to the prose of Shakespeare (Pudovkin, 1950; Eisenstein, 1939; Lawson, 1967). D.W. Griffith further developed uniquely filmic formal features as dramatic emphasis and created impressions of mounting intensity through the use of visual pacing, which evolved into the intrinsic elements of film-making (Reisz & Millar, 1972). The formal features of visual structure, so carefully developed by the motion picture industry were adopted by the photojournalists who created the popular newsreels in the twenties, thirties and forties (Yoakam & Cremer, 1989). These elementary approaches in the development of formal features became the foundation for the evolution of structure in TV documentaries and news stories, with all its inherent elements of formal features.

Alfred Hitchcock perhaps best illustrates the reactive theory when he describes one of the medium's formal features,

"the camera has immersed the audience ... the point is to draw the audience right inside the situation ... breaking the action up into details and cutting ... so that each detail is forced in turn on the attention of the audience. If you played the whole scene straight through ... you would lose your power over the audience" [italics added for emphasis] (McCann, 1966, p. 57)

Some social scientists have offered criticisms of the reactive conceptualization (e.g., Anderson & Lorch, 1983). They argue that children's comprehension of TV program segments largely controls visual attention in settings of play activity with other children, rather than guided by the program's formal features. Critics also claim that visual formal features have a very limited effect on attentive TV watching by young children in these settings.

Nevertheless, the complexity of media communication may be better understood by integrating aspects of both theories, perhaps expanding principles from the reactive theory, which may be primarily involuntarily and kinaesthetic (Vorkapich, 1959, Ohman, 1979; Pribram, 1979; Siddle & Spinks, 1979; Sokolov, 1969), and incorporating the more contemporary active conceptualization (Anderson & Lorch, 1983), which assumes more cognitive control of viewers' responses to TV programs. Recent theoretical and empirical research now suggests a synthesis of both conceptual frameworks (Wright & Huston, 1981; Calvert et al., 1982). Combining the reactive and active approaches into a meaningful synthesis was achieved by Gavriel Salomon (1980), who imbedded these concepts into Neisser's (1976) spiral model of perception and cognition (See Figure 2):

"According to this model, one's mental schemata - including different kinds of symbolic representations - direct our perceptual exploration. Exploration, in turn, samples, constructs and provides meaning to external stimuli which are then incorporated into the schemata and change them accordingly". [italics added for emphasis] (Salomon, 1987, p. 258)

Salomon's "mental schemata" can be interpreted as the active framework involving the individual's cognitive activity that processes perception and, in turn, "provides meaning to external stimuli." The reactive framework is seen as the "external stimuli," which in part controls, reshapes and provides new meaning to the individual's mental schemata. In this conceptualization, the viewer requires two quite unique types of knowledge: the knowledge to interpret TV's representation of reality, and second, the mental effort required to follow the filmic structure of the program, which in turn allows the viewer to interpret reality in a new way. As the spiral model suggests, this process perpetuates itself indefinitely. Both paradigms, the active and the reactive are incorporated and for the purposes of the present study, the focus of analysis will assume this integrated conceptualization.



Figure 2. An integrated model of perception, adapted from Neisser's (1976) spiral model of perception and consolidated with Salomon's (1987) theory.

# Pacing as a Formal Feature

Television has traditionally been researched regarding its content. This research has mainly focused on the potential relationship between the apparent violence on television and its possible effects on children (Collins, 1975; Noble, 1975; Salomon, 1974; Spencer Foundation, 1977; Tower, Singer & Biggs, 1977). Other researchers have studied the use and gratification of TV, particularly among older adults (Fouts, 1989; Fouts & Abraham, 1988; Hasselquest, 1992; Davis, 1980; Davis, Edwards, Bartel, & Martin, 1976; Doolittle, 1979; Goodman, 1990; Heatherington & Fouts, 1985; Korzenny & Neuendorf, 1980; Kubey, 1980).

Only since the 1970's have social scientists recognized the importance of the <u>form</u> or the formal features of the medium. Television does not simply transmit information, its content is circumscribed in a unique amalgam of symbol systems distinctive to the medium (Salomon, 1979). The importance of form and content are highly integrated; "Television is a representational system, not little people behaving in a box" (Dorr, 1977). Thus, life for the medium is rendered into a new reality, interpreted and represented through various symbols of form.

Social scientists describe the salient visual features of television as one of its formal features. This refers to television's representational mode, the intricacies of visual structure, type and rate of movement, visual cuts, zooms and pans (Huston & Wright, 1983). In short, formal features are those elements normally perceived by social scientists as representational modes and forms of presentation (Rice et al., 1983; Salomon, 1979). Professionals in the TV industry, who are engaged in creating programs and visual effects refer to these visual elements as production techniques (Burrows, Wood & Gross, 1992; Fielding, 1990). Some auditory features (e.g., sound effects, non-human speech, loud music, music bridges) also fall within this general field, but will not be addressed in this study.

The present research focuses exclusively on the formal feature of pacing or rate (flow) of visual presentation, which can be varied through the editing process in preparing the visual content. In most media research, there appears to be a lack of a clear and concise definition of pacing, with most references using pace, presentation rate, intercutting and shifts of scene interchangeably (Huston & Wright, 1983; Watt & Welch, 1983; Singer, 1980). For the purposes of the present study, visual pace will be defined as the ratio of visual information per unit time.

Pacing can be altered by mechanical or electronic means, i.e., by presenting the images on the television screen in a shorter or longer period of time. If the same amount of visual information is presented in a shorter period of time or speeded up (time-compressed), then the rate of visual presentation would appear faster-than-normal; whereas if it were presented in a longer period of time or slowed down (time-extended), then the rate would appear slower-than-normal to the viewer. It is possible to obtain any visual segment of a television program and vary its pace by compressing or extending the time in which it is presented. Given this approach to pacing, the question is: What is the optimal pace for most viewers? But even more specifically, does this optimal pace for enjoyment and learning change with age?

The phenomenon of pacing has attracted some social scientists to direct more research into this element of formal features; "... one may take an aspect of program form, such as camera cuts, and see what effect changes in cutting rate have on coders' perception" (Krull, Watt, Lichty, 1977, italics added for emphasis).

Since the study of media-specific formal features is a relatively new field of study for social scientists, only a limited number of studies have examined the effects of rate of presentation on TV viewers. Its focus here too has almost entirely centred on the relationship between television's formal features and children (Fouts & Flessati, 1983; Wright, et. al., 1984; Del Guercio, 1984; Sturm et al., 1983; Salomon, 1983; Rice, Huston & Wright, 1983; Salomon, 1979 & 1983). In general, the research in children's programming has shown that more learning takes place in slower-paced TV programs (Singer, et al., 1977). Whether this effect may also conform to produce a higher degree of learning using slower-paced programs (time-extended) aimed at aging viewers has been analyzed in the present study.

Other researchers have conducted time-compression experiments centering on radio and television ads (e.g., MacLachlan, 1979; Maclachlan & LaBarbera, 1978; MacLachlan & Siegel, 1980), with its goal being to reduce advertising costs and to determine the most effective rate of information flow. These studies have found that time-compression of commercials by 25% was considered subtle, and that subjects tended to enjoy them more and recall brand names considerably better than commercials without time-compression.

The present study intends to expand the previous formal features research in two ways: (1) by expanding the content, which has heretofore been limited to advertising and children's programs, to information programming; and (2) by studying the effects of formal features on a predominantly older television audience.

# Pacing of Visual Information and Aging Viewers

It appears that as young as 45 years, there begins a gradual reduction in a person's speed of processing information, thus a reduction in learning proficiency (Birren, 1974). Early studies on aging by psychologists and neurologists note an apparent diminishing response time in aging individuals (Critchley, 1942; Magladery, 1959). More specific studies point to a general slowing of sensory ability with age (Weiss, Most older adults also face a gradual deterioration in the 1959). efficiency of their central nervous system, with perception and memory becoming less proficient (Birren, 1974; Zitter, 1990). For example, studies have indicated that older adults require more time to process information (Weiss, 1959; Krull, Watt & Lichty, 1977; Phillips & Sternthal, 1977). Considering such declines, older viewers need more time to process material, but with a decrease in time (as in time-compressed), then older viewers would be particularly disadvantaged. Conversely, by slowing the pacing of visual information (as in time-extended), then older viewers may be able to better learn from these programs.

Further research into sensory psychology indicates a significant deterioration in the central neural processing system with age (Walsh, Williams, & Herzog, 1979; Posner & Mitchell, 1967; Kahneman, 1968; Turvey, 1973). For example, older subjects appear to observe less flicker in flickering lights and seem to view the phenomenon as a light glowing at a lower frequency. Additionally, the visual response appears to be slowed by the retention of the former image in the central nervous system (Kline, 1972). Thus, response time to a new stimulus is initially slowed through neural decay, and then as the next visual stimulus is projected, further impeded by the image retention of the former picture. According to Botwinick (1982), "the person is not optimally ready to process the input of the second stimulus." This type of research suggests that with age, the visual presentation of information takes longer to reach the optimal effectiveness in communicating to the viewer. Translated to the TV medium, this visual persistence of one image may interfere (leave visual trace), upon the following image. A type of unintentional dissolve is created and when quickly followed by yet another image, the visual trace of the initial picture may still persist. This could create an illusion of many images superimposed. This unintentional phenomenon can easily be remedied by lengthening the duration of images or by time-extension, thus each image would have the opportunity to be fully neurally registered and mentally perceived, before a new image is introduced. Conversely, through time-compression, this impression of visual interference (the apparent superimposition of more than one image) would be exacerbated and leave the communication process distorted and impaired for aging viewers.

Closely related to a general decline in perceptual sensitivity with increasing age is the apparent limited capacity of older adults to sustain focused attention on a sequence of stimuli (Kausler, 1982). Consequently, elderly TV viewers' attention may be more easily diverted through extraneous stimuli. This may play an important part in maintaining older viewers' attention during news stories that contain various distracting visual stimuli, while oral, voice-over descriptive commentary provides most of the significant information. These peripheral factors, according to Kausler (1982), "are a consequence of the deterioration in sensory receptors and their ancillary structures that accompanies human aging." Considering that pacing of visual flow may potentially become a distraction (as in time-compression), other accompanying detractors such as the quickening of voice-over narration may exacerbate the problem. In contrast, when pacing is slowed (as in time-extension), older viewers' attention may be optimized and their learning as well as enjoyment may be enhanced.

Aging is also related to declines in hearing and visual acuity (Chaffee & Wilson, 1975; Zitter, 1990; Kausler, 1982). Hearing becomes impaired with age as sensitivity to higher frequencies weaken; another major change includes a reduction in the facility to distinguish between pertinent sounds and background noise (Zitter, 1990). Furthermore, eyesight becomes impaired by an increase sensitivity to glare, with older adults needing more light (Zitter, 1990). Older eyes also face a decrease in potential depth perception (Kausler, 1982) and an inability to discriminate between colours, especially in the blue-red combination of violet, the colour seen at the end of the spectrum opposite red. Other colours such as blues and greens are also difficult to distinguish (Zitter, 1990). These diminishing sensory abilities may play a subsidiary role in further impeding already dwindling neural capacities, thus the impact of time-compression or increased visual pacing may further inhibit viewing pleasure when the pacing of TV news stories has already surpassed (as in time-compression) the optimum learning and pleasure curve for aging viewers.

With all these changes associated with aging, the question raises for aging viewers of TV who overwhelmingly prefer watching news programs: does the pacing in news stories influence their enjoyment and learning of the informational contents?

The editing of pace in videotaped news stories is one of the final stages of the electronic news-gathering process and often appears to the

editor to replicate reality as well as represent the typical speed of mental processing, e.g., as the eye and the mind function to focus from one object to another in real life (Reisz & Millar, 1968; Lindgren, 1948; Manvell, 1955; Salomon, 1979). Through the use of editing techniques to manipulate real time by electronically time-compressing and time-extending of television contents (MacLachlan, 1979; MacLachlan & LaBarbera, 1978; MacLachlan & Siegel, 1980); one can present the news material faster-thannormal or slower-than-normal. Therefore, it is possible to present news stories at speeds which may more closely fit the visual capability of older viewers and to match their mental processing speeds, thereby optimizing the enjoyment and learning of the contents.

# Design of Study

The purpose of this study was to manipulate the pace of presentation of television news stories by obtaining normally paced and professionally edited news stories and altering the pace so that the stories could be presented at faster-than-normal rate and slower-than-normal rate. With the resulting three paces (normal, faster, slower), viewers' reactions could then be assessed. Adults from two age groups, young adults (ages 18-39 years) and older adults (50-74 years) observed a combination of two different news stories presented at two of the three rates: normal, timecompressed or time-extended speeds. Following each presentation, the subject's affective responses to pacing, program enjoyment and their learning of the information were assessed.

The Hypothesis: Aging adults, those between 50 - 74 years of age, would enjoy (i.e., have greater interest and enjoyment) and learn more contents while viewing slower-paced television news stories than younger adults aged 18 - 39 years, with the reverse trend for faster paced

19
stories. The predicted trends are graphically presented in Figure 3.



Figure 3. Graphic presentation of the Hypothesis.

Rationale: Assuming that older viewers require more time in order to process visual information relative to younger individuals (Phillips & Sternthal, 1977), then television news stories which are slower and presumably visually match viewers' speed of mental processing should be the most comfortable and should allow more time for learning than programs in which the visual pacing is too rapid (faster than their mental processing speed). Conversely, for young adults, visual pacing which is too slow (slower than their mental processing speed) may be too boring or understimulating, with the result being less enjoyment and concentration and therefore, less learning relative to programs which are presented at a faster pace.

#### METHOD

### Subjects and Design

One hundred and sixteen people (50 females and 66 males) were recruited to participate in this study. There were two groups (58 participants each) of participants, one group (Young Adults) consisted of young adults; a majority were Mount Royal College students. They were recruited from course seminars and also by referral of friends and relatives who were involved in the study. The age range was from 18 to 39 years, with an average age of 25 years. The second group (Older Adults) was composed of 'young-old' adults from senior clubs and college employees; the age range was from 50 to 74 years and the average age was The Older Adult group was recruited in two different ways. 59 years. First, the researcher contacted various seniors clubs in the Calgary communities of Bow Cliff, Renfrew, Glamorgan and Confederation Park. The social coordinators of the seniors clubs then recruited volunteers through personally seeking out likely candidates, by putting up notices asking for volunteers, and by asking for volunteers at weekly meetings. Second, the researcher recruited participants from college faculty and staff through obtaining a list of older faculty and staff members from the faculty and staff associations and sending letters to those on these lists. Än article was also written for the staff association newsletter, requesting volunteers. Each age group was divided into six subgroups, A through F (Figure 4) in order to control for the possible effect of order of presentation of the 3 different paces; therefore, each subgroup contained 9 - 11 participants (dependent on the actual number of participants in the initial college seminar group).

21

	YOUNGER	OLDER
Group A	4.male	4 male
(N-TC)	5 female	5 female
Group B	5 male	5 male
(N-TE)	5 female	5 female
Group C	8 male	8 male
(TC-TE)	3 female .	3 female
Group D	5 male	5 male
(TC-N)	4 female	4 female
Group E	6 male	6 male
(TE-N)	3 female	3 female
Group F	5 male	5 male
(TE-TC)	5 female	5 female

Figure 4. Sub-group age and sex distribution.

The basic design of the study was a  $2 \ge 2 \ge 2$  factorial design with age and gender being between-subject factors and pace being a within-subject factor.

# Stimulus Materials

In order to obtain contents and formal features of TV news stories which would be appropriate for the present study, TV newscasts were recorded over a three month period. The use of these recorded programs ensured that the formal feature of visual pacing was established independently by professional television industry's standards.

The goal was to select two different television news stories to serve as the content stimuli for the study. Two distinct, yet similar news stories, and two stories which would be considered representative of TV news in general were sought. After examining many news stories, two were selected (Appendix A and B), based on the following criteria. First, the news stories were comparable to the usual 'line-up' of stories in typical TV newscasts. For example, since the level of local or regional importance is normally determined by the placement in the TV news broadcast (Yoakum & Cremer, 1989), two news stories which were broadcast (May 7 and 11, 1992) at approximately the same time (around 6:30 PM, halfway into the newscast) were selected. Second, the stories were part of an ongoing mini-series of TV news features called, "Working in the 90's." This selection ensured that the general content of the stories conformed to the issues and current events of the time. Third, the two news stories were produced by the same TV station, CFCN-TV, Calgary, thus resulting in similar treatment of the formal features. Fourth, the two news stories were approximately the same length. One was 2:05 minutes, the other 2:04 minutes in length; thus, they differed by only one second. Fifth, the format of the news stories was very similar; i.e., the use of formal features was closely matched. For example, the stories had approximately an equal number of scene changes and they had a reporter finish the news story with the same 'standup'-type of closing. Figure #5 presents a description of the two stories in terms of scenes, contents and lengths. Additionally the stories had similar numbers of edits and durations of shots. For example, the "SAIT II" story contained 17 edits in 129 seconds, averaging approximately seven and a half seconds per finished shot; the "Friends of the Family" story contained 20 edits in 128 seconds, averaging about six and a half seconds per length of shot. Sixth, in order to facilitate time-compression and -extension of the TV news stories, both stories were primarily presented through visuals with `voice-over' descriptive commentary. This matching decreased substantially the potential 'lip-synch' problems of resynchronizing the

sound with the 'on-camera' people in producing the time-compressed (TC) and time-extended (TE) programs.

News story #1, "Working in the 90's: SAIT II", recorded, May 7, 1992:

Scene	Description	Length	Running length
1	Standard series introduction	:07	:07
2	Reporter's V/O narration	:48	:55
3	Interviewee's V/O narration	:09	1:06
4	Interviewee on camera	:10	1:16
5	Reporter's V/O narration	:07	1:22
6	Interviewee's V/O narration	:07	1:30
7	Reporter's V/O narration	:20	1:50
8	Reporter on camera	:15	2:05

News story #2, "Working in the 90's: Friends of the Family", recorded May 11, 1992:

Scene	Description	Length	Running length
1	Standard series introduction	:07	:07
2	Reporter's V/O narration	:40	:46
3	Interviewee #1 on camera	:08	:53
4	Interviewee #2 on camera	:08	1:02
5	Reporter's V/O narration	:15	1:19
6	Interviewee #3 on camera	:07	1:27
7	Reporter's V/O narration	:22	1:50
8	Reporter on camera	:14	2:04

Figure 5. Description of the two news stories in terms of scenes, contents and lengths.

#### Development of Stimulus Materials

For each TV news story, the formal feature of pacing or rate of visual flow was electronically altered by 20%, a change considered guite subtle (MacLachlan, 1979). Each original story was operationally defined as being presented at a normal pace, with two other versions electronically produced: a time-compressed version (20% faster) and a time-extended version (20% slower). In order to create the two new versions of each news story, two different electronic techniques were employed. First, the audio track was independently time-altered with a technique distinct from time-altering visual stimuli, since normally audio pitch varies with the pace of visual stimuli (normally 30 frames per second). The synchronized audio track was 'stripped' or re-recorded from the videotape using the highest quality available 15 ips. (inches per second), through an Ampex 440, 1/4" audiotape recorder. A short audible beep ("synch" pulse at 60 cycles) was recorded to make certain that the audio could later be put back on the videotape "in-synch". Thus, with the audio track removed from the videotape, it was then possible to change the speed of the audio separately from that of the video portion. A device similar to using the Lexicon Varispeech II (Maclachlan & Siegel, 1980), which electronically removes or adds minute fractions of the audio track, was used to time-compress and time-extend the audio, respectively. This technique was used rather than merely speeding up the audio or slowing it down, since the latter would change the pitch.

Sound engineers at a local sound-recording studio were commissioned who could transform or process the audio. By using the "time-scale" program from a Studer Dyaxis machine, the audio was either time-compressed and time-extended by 20%, the equivalent of 6 video frames per second. The time-compressed version of "SAIT II" was transformed from 2:05 mins. to 1:33 mins.; the time-extended became 2:37 mins. The "Friends of the Family" news story changed from the normal 2:04 mins. to a time-compressed version of 1:32 mins.; the time-extended version was 2:36 mins. in length.

The second technique involved the visual portion of the videotape, which was independently sped up or slowed down using a process which did not reduce the quality of the picture (e.g., no frame lines or blurring), but merely altered the duration of each story by 20%. The original videotape (Sony Beta II VCR format) was dubbed onto one-inch C-format, broadcast standard videotape. Then, by using a broadcast-standard videotape recorder (AMPEX VPR 80), equipped with an AST head system, this dubbed version was then played back and re-recorded by re-processing the video portion of the news story at the required speeds, i.e., 20% faster and 20% slower. Thus, by reprocessing the normally-edited news stories at the two different speeds (20% faster-than-normal and 20% slower-thannormal), each news story had three video variations: normal, timecompressed and time-extended.

The recombining and re-synchronizing of the processed audio to the processed video required considerable skill and time. The processed audio track was recorded onto a blank, "striped" videotape (with prerecorded control-track pulses). Then, using an "insert-edit" mode, the video was recorded in such a way as to match the audiotrack. Several attempts at precise audio-visual synchronization ("lip-synching") were made, but the video playback VTR would not stay in precise synch with the audio for the duration of the news story. This is not normally problematic for most broadcast news stories, since a majority use voice-over narration, rather than sound synchronized with mouth movements, thus not requiring precise synchronization. However, in the present study, during the interviews and other on-camera shots, the "lip-synch" was very critical in order for all three versions of each news story to be of equal production quality. At times, the resynchronization required editing and matching only a few seconds at a time. Nevertheless, the final result of the difficult resynchronization of the audio and video portions of each story was three quality matched versions of each news story: normal, time-compressed and time-extended.

#### Assessment Instruments

The effect of observing two news-stories, with each presented at a different rate, was assessed using a questionnaire with five sections. The first two sections were demographic information and TV viewing information.

<u>Demographic Information</u>. The demographic section asked participants about their gender, birthdate, education level and type of occupation.

TV Viewing Information. The TV viewing section of the questionnaire asked participants about their TV news viewing habits. This part of the instrument included questions regarding the number of television sets in the home, how many daily hours participants watched television, whether they subscribed to TV cable service, as well as whether they watched specialty cable TV news service, such as CBC's Newsworld or CNN. Participants were also asked how many hours daily they watched all TV news on these specialty TV news channels. This section also included questions regarding how many times during the day they watched TV news and which TV stations or channels they selected on which to watch their news.

The next three sections of the questionnaire involved questions

inquiring about what they had observed in the stimulus news stories: what they felt (Affective Response) and their evaluation of formal features in the news story (FF Evaluation), how much they enjoyed each news story (Enjoyability), and what they learned from the informational content (Learning Information).

Enjoyability response. Participants were asked to respond to the following general question: "How do you feel about the content of the news story you just viewed?" This question was answered along 10 emotional dimensions: enjoyable, informative, important, interesting, emotionally involving, worthwhile, relevant, understandable, motivating, and created a new awareness. A 5-point Likert semantic differential scale (Babbie, 1983) was presented for participants to respond to each dimension, with the response choices being "Strongly Disagree", "Disagree", "Undecided", "Agree", and "Strongly Agree". The instructions asked participants to place a check mark in the appropriate brackets to indicate the response that most accurately described how they felt. This instrument was pilot tested using 10 older adults.

Formal feature evaluation. These questions assessed participants' affective response to pace related formal features. Participants were asked to respond to the following general question: "How do you feel about the production techniques in the news story you just viewed?" They responded to the following 10 statements: (1) "The pictures appeared <u>IN A NATURAL PROGRESSION</u>," (2) "The pace or speed of pictures changed <u>TOO SLOWLY</u> for my taste," (3) "The picture changes (edits) <u>WERE SO SMOOTH</u> that I was unaware of these changes," (4) "This news story was presented <u>TOO QUICKLY</u> to absorb the content," (5) "The pictures <u>MEANINGFULLY SERVED</u> <u>TO ILLUSTRATE</u> the content of the report," (6) "The picture changes (edits) were <u>TOO ABRUPT</u> for my comfort," (7) "The pace or speed of the pictures changed <u>TOO RAPIDLY</u> for my taste," (8) "The pictures <u>WERE TOO</u> <u>BUSY OR COMPLEX</u> to be fully understood," (9) "Some items should have been photographed in <u>BOLDER</u> detail (<u>UP CLOSER</u>)," and (10) "This news story was presented <u>TOO SLOWLY</u> to absorb the content". The same 5-point Likert scale was used ("strongly agree" to "strongly disagree") to measure participants' responses. These formal features have been examined by previous researchers (e.g., Bryant & Anderson, 1983; Reisz & Millar, 1972; Salomon, 1980; Krull, Watt & Lichty, 1977; Manvell, 1955; MacCann, 1966 ) and a majority of the formal feature statements were based on these previous studies. This instrument was pilot tested.

Learning information. This section assessed how much of the informational content of a news story was learned by participants. Ten questions tapping specific pieces of information were presented to participants. These questions were based on orally as well as oral/visually presented information. The number of oral and oral/visual informational questions was the same for each story, 7 oral and 3 oral/visual questions. This ratio reflected the balance and sources of information in the two stories. The participants were presented with the information questions and given 4 multiple choice answers for each from which to choose. An example (based upon the "SAIT II" program) of an information question and its answer alternatives is "Which government program was paying these students to be in this program?"

- a. Canada Manpower
- b. Canadian Job Strategies
- c. Department of Immigration
- d. Hire a Student

Participants were asked to circle the correct answer.

#### Procedure

Participants were tested in different locations depending upon their availability. Rooms which could seat up to 12 individuals comfortably, with desks, were used. Group size varied from 2 to 12 persons. The room was adapted for the purpose of the experiment, with a high quality VCR and a large, 21 or 28 inch TV monitor, depending on the location of testing.

Before the experiment, the tapes were checked for proper start points, audio volume adjusted to a uniform level, and the dimming switch for overhead lighting was located and checked. Participants were seated so that the screen images would appear similar in size (depending upon whether a 21 or 28 inch monitor was used), using the guideline that maximum viewing distance would not exceed 10 times the diagonal measurement of the screen.

The researcher introduced himself, stating that he was a graduate student in Communication Studies at the University of Calgary and that this research was in partial fulfilment of the requirements for the degree of Master of Arts. A short statement outlining the 17 years the researcher had spent in public as well as private television as a TV director was presented as well as how this experience had led him into this particular field of study. The group was also told that this experiment had been awarded a small research grant by the University of Calgary, which allowed a stipend to be dispensed to each of the participants at the end of the experiment. The group was told that this experiment would take about 35 minutes. The general purpose and nature of the study was then explained. The consent form and the cover sheet to the questionnaire package were introduced. The researcher emphasized the anonymity of their participation and told them that the consent forms would be filed separately from the data in the Communications Studies Department. Participants were then asked to read the consent form carefully. The researcher verbally emphasized that their involvement was strictly voluntary and that anyone could withdraw at any time, or to refuse to answer any particular question. Upon signing the consent form, the first two sections of the questionnaire were introduced. The participants were then asked to answer only the Demographics and TV viewing information questions on pages 2, 3 and 4 in their questionnaire booklet.

After all the participants completed these sections of the questionnaire, a practice section was introduced.

Practice. This section was an abbreviated version of the last 3 sections of the questionnaire which assessed how much participants enjoyed the story, their affective responses to its formal features, and how much they learned. It was used with a news story different from the stimuli developed for the study. This practice served three purposes. First, it was used to familiarize participants with the procedure and stimulus materials. Second, it allowed the participants to get acquainted with the types of questions that would be asked regarding their observation of a news story. Third, it alerted participants that questions of form and content would be asked. This practice questionnaire was pilot tested with five medium-aged couples so that instructions and questions could be modified as needed.

For this practice, participants were told that during the next few minutes, they would be asked to watch a short "practice" news story, after which they were to answer the questions on pages 5 and 6 of the

questionnaire. They were informed that this practice was intended to familiarize them with the type of TV news story to be seen in the experiment and the types of questions they would be asked after viewing each news story. They were told that the answers to the practice would not be scored. The lights were dimmed and the practice TV news story was presented. When the news story ended, the lights were turned up and the participants completed the practice section of the questionnaire. Upon completion, the group was asked if the news story or the questionnaire posed any problems or questions. Throughout the actual experiment (the testing of 116 participants), very few questions arose, indicating the benefits of piloting the materials and the clarity of the instructions and questionnaire.

In preparation for the actual experiment, the participants were told to please refrain from commenting or talking to each other. The lights were dimmed once more and the first news story was presented, after which the lights were turned up. The group then completed the next 6 green pages of the questionnaire (enjoyability response, formal feature evaluation and learning sections), colour coded green for easy reference. Upon completion, the lights were again dimmed and the second news story was presented, after which participants completed the last 6 yellow pages of the questionnaire, i.e. their enjoyability response, evaluation of formal features, and what they had learned from the news story. This concluded the experiment.

The order of presentation of the pace of the 2 stories and the story contents were counterbalanced such that the 2 different story contents appeared equally in the 3 paces and presented an equal number of times first and second to the participants (Figure 6).

Groups:	Story #1	Story #2
Sub-group A	Normal Speed	Time-Compressed
Sub-group B	Normal Speed	Time-Extended
Sub-group C	Time-Compressed	Time-Extended
Sub-group D	Time-Compressed	Normal Speed
Sub-group E	Time-Extended	Normal Speed
Sub-group F	Time-Extended	Time-Compressed

Figure 6. Sub-groups controlling for order of presentation of the three paces of visual presentation.

The participants were thanked for their voluntary involvement and were told that the general results of this study would be made available in about two months. The subjects signed a receipt for the stipend, upon which they were given five dollars.

#### Data Scoring

Direct Data Scoring. All the data were discreet and readily quantifiable. The researcher transcribed the questionnaire data directly onto data sheets and later entered the data into the computer data base. The only exceptions to this were that (1) responses to daily and weekend viewing were calculated and totalled into "total number of hours TV viewed per week;" (2) responses to watching news on Cable TV, CBC's Newsworld, and watching all other TV news were totalled into a "weekly total of hours of news viewing;" (3) responses to which times during the day news is watched was added giving "total number of times," and (4) which different channels daily were tuned to watch news was totalled giving "total number of TV channels".

#### RESULTS

#### Reliability of Data Scoring and Coding

To assess the reliability of data scoring and coding, approximately 10% of the sample (n = 10) was randomly chosen to have their data scored by an independent coder. All 31 variables were scored and coded for the 10 subjects. Almost perfect agreement was found between the two coders. Of the total 310 data points (31 variables X 10 subjects), only one disagreement was found, indicating very high reliability ( $\underline{r} = 0.99$ ,  $\underline{p} < 0.001$ ).

Female and male participants were included in this research in order to increase the generalizability of the findings. Since there is no theoretical reason to expect gender differences associated with the possible effect of the pace of presentation of the news stories, gender was not included in the analyses.

#### Participant Demographics and Media Use

One hundred and sixteen people participated in the research study: half of the participants were young adults, the other half aging adults. The demographic variables of the participants can be viewed in Table 1. Forty-three percent of the participants were female, 57% percent were male. Twenty-three percent of the group had completed high school, while 45% percent had received some college or university education, with 19% being graduates; 13% had more than one degree.

Thirty-two percent of the participants were presently college or university students, 31% were professionals, 18% were retired, 12% held clerical or sales positions, while 6% were in the trade occupations; 1% were homemakers.

Almost all the participants had at least one television set; only 1% reported no TV in their home. Thirty-three percent had one TV, 35% had 2 television sets, while 23% had 3 TVs; 8% had 4 television sets.

Television viewing ranged from 0-69 hrs. per week, with a mean of 21 hrs. watched weekly. The vast majority (89%) were subscribers of cable TV; 11% had no cable.

Participants watched an average of 7 hrs. of news weekly, generally viewing TV news twice daily; 64% sometimes watched CBC's <u>Newsworld</u>, 29% never watched <u>Newsworld</u>; 7% of participants did not complete this question. Sixty-nine percent sometimes watched CNN, 23% did not watch CNN; 8% of participants did not complete this question.

# TABLE 1

.

# Participant Demographics (N = 116)

<u>Variable</u>	<u>n</u>	8
Gender		
Male	66	56.9
Female	50	43.1
<u>Education</u>		
Grade XII	12	10.3
High school diploma	15	12.9
Some college or university	52	44.8
College or university degree	22	19.0
More than one degree	15	12.9
Occupational Status		
University of college student	37	31.9
Homemaker	1	.9
Professional	36	31.0
Sales or clerical	14	12.1
Retired	· 21	18.1

.

#### Statistical Analyses

Before analyzing the effects of pace of presentation on enjoyability and learning using a multivariate analysis of variance, Latin square analyses, which included order of presentation and pace of presentation as factors, were conducted. This was done since it was possible that the occurrence of one condition before another (there were 6 different order combinations, e.g., TE - TC vs. TC - TE) could influence the effect of the second condition. There were no significant effects (p > .05) of order of presentation, or interaction with pace of presentation for either the enjoyability or learning measures. Therefore, the conditions were collapsed regardless of order of presentation (e.g., TE - TC and TC - TE were combined appropriately). Because the design of the experiment (Latin square controlling for order of presentation) and its efficient use of participants, it was not statistically possible to include the three pace conditions and age of participants in the same analysis. Therefore, separate 2 X 2 analyses (using the condition and age as between-subject factors) were conducted for each pair of conditions (TE & N, TC & N, TE & TC), collapsing across order (e.g., TE - N and N - TE).

In the following three sections, the multivariate analyses for each formal feature question assessing participants' affective responses to formal features are reported, followed by the total enjoyability variable. The third section presents the analysis of learning associated with the three pace conditions.

#### Analyses of Formal Features

It was expected that aging adults, those between 50 - 74 years of age, would respond differently to the formal features of slower-and

faster-paced television news stories than younger adults aged 18 - 39 years, e.g., aging adults would think that time-compressed programs were too fast, with younger adults believing that time-extended programs were too slow.

Pictures appearing in natural progression. A Condition X Age multivariate analysis of variance applied to the TE/N groups (Table 2) revealed no significant effect of Age or Condition; there was a significant Condition X Age interaction, F (1/36) = 4.56, p = .0397, which is graphically presented in Figure 7. An examination of this interaction revealed that older viewers reported that the normal condition was significantly less natural than the time-extended condition, with younger viewers reporting the reverse trend, i.e., they perceived the normal pace as significantly more natural than the time-extended pace. There was no significant difference in the perception of either TE (time-extended) nor N (normal) condition between the two age groups.

A similar analysis (Table 2) applied to the TC/N groups revealed no significant Age or Condition X Age interaction effect; however, there was a significant effect of Condition, F (1/33) = 17.70, p = .0002. It was found that the normally-paced programs were viewed as more natural than programs at the time-compressed pace by all viewers. Analysis of the TE/TC groups (Table 2) revealed a significant effect of Age, F (1/38) =11.62, p = .0016, and Condition, F (1/38) = 12.39, p = .0011, with no significant Condition X Age interaction occurring. Thus, it was found that older viewers viewed the time-extended and the time-compressed conditions as significantly more natural than younger subjects; furthermore, subjects in general viewed the time-extended condition as significantly more natural in progression than the time-compressed condition.

# Table 2

# Formal feature question regarding pictures appearing <u>IN A NATURAL</u> <u>PROGRESSION</u>; the analyses and means.

# CONDITIONS

	TE-N	N-TC	TE-TC
Age:	* N.S.	N.S'.	.0016
Condition:	N.S.	.0002	.0011
Condition X Age: (interaction)	0.0397	N.S.	N.S.

# CONDITIONS

		TE	N	N	TC	TE	TC
	Young:	** 3.8	4.1	4.1	2.9	3.3	2.6
<u>nge</u> :	Old:	4.0	3.8	3.8	3.4	3.9	3.5
		N= 80	N= 74	N= 74	N= 78	N= 80	N= 78

\* <u>p</u> level of significance \*\* mean level of agreement



.

Figure 7. Formal feature question regarding pictures appearing <u>IN A</u> <u>NATURAL PROGRESSION</u> for young and old participants under normal and time-extended conditions.

An examination of these findings revealed that viewers responded differently to the 3 paces according to their age; i.e., older viewers perceived the slower-paced news stories as more natural; whereas younger viewers appeared to view the normal-paced news stories as more natural. It was found that, overall, the time-extended and normally paced programs were comparable in being viewed as natural in progression, with the timecompressed programs being viewed as significantly less natural in progression. Thus, time-extended programs and normally paced programs were perceived as equally natural in progression, whereas time-compressed programs were considered less equal as being natural in progression.

ſ

<u>Pace too slowly</u>. A Condition X Age multivariate analysis of variance applied to the TE/N groups (Table 3) revealed a significant effect of Age, F (1/36) = 4.39, p = .0432; younger viewers viewed both conditions as slower than did the older viewers. There was a significant effect of Condition, F (1/36) = 6.04, p = .0189. The time-extended programs were viewed as too slow compared to the normally-paced programs.

A similar analysis applied to the TC/N groups revealed no significant effects of Age nor Condition X Age interaction; however, there was a significant effect of Condition, F (1/33) = 8.86, p = .0054. The time-compressed condition was viewed as not being presented too slowly.

Analysis of the TE/TC groups revealed no significant effects of Age nor Condition X Age interaction. There was, however, a significant effect of Condition, F (1/38) = 12.39, p = .0000, indicating that all the viewers reported the time-compressed condition as not being too slowly presented.

One can conclude from these analyses that viewers, both young and old, appeared to be quite sensitive to alterations in the pacing of TV programs; i.e., time-compressed programs were the least to be viewed as

# Formal feature question regarding PACE TOO SLOWLY; the analyses and means.

	TE-N	N-TC	TE-TC
Age:	* 0.0432	N.S.	N.S.
Condition:	0.0189	0.0054	0.0000
Condition X Age: (Interaction)	N.S.	N.S.	N.S.

CONDITIONS

.

#### CONDITIONS

.

		TE	Ν	N .	TC	TE	TC
	Young:	** 2.5	2.1	2.2	1.6	2.8	1.5
<u>nge</u> +	Old:	2.1	2.0	2.0	1.8	2.3	1.8
		N= 80	N= 74	N= 74	N= 78	N= 80	N= 78

\* <u>p</u> level of significance \*\* mean level of agreement too slow, with time-extended being viewed1457% are slowest of the three conditions. In light of former research (e.g., McLachlan, 1979), that 25% time-compression and time-extension was considered quite subtle, the evidence here indicates that viewers were quite aware of 20% difference in pacing.

<u>Picture changes (edits) were smooth</u>. A multivariate analysis of variance applied to the TE/N groups (Table 4) revealed no significant effects of Age or Condition, nor a Condition X Age interaction.

A similar analysis applied to the TC/N groups revealed no significant effect of Age; there was a significant effect of Condition, F (1/33) = 40.58, p = .0000; i.e., viewers appeared to be more aware of the edits in the time-compressed programs than in normally paced programs. There was also a significant Condition X Age interaction, F (1/33) = 4.87, p = .0343; this is graphically presented in Figure 8. An examination of this interaction revealed that younger viewers perceived the contrast between the time-compressed and normal conditions in terms of the smoothness of picture changes significantly more than the older group.

Analysis of the TE/TC groups revealed no significant effects of Age nor a Condition X Age interaction. There was, however, an effect of Condition, F (1/38) = 40.38, p = .0000; viewers were more aware of the edits in the time-compressed than the time-extended condition.

It was found that time-extended and normally paced programs were comparable in being viewed as having smooth picture changes, with the time-compressed programs being viewed as significantly less smooth in its picture changes. One can conclude from these analyses that time-extension did not influence viewers' perception of smoothness as contrasted with the natural program. However, as the pacing increased from normal to being

.

Formal feature question regarding picture changes as being <u>SMOOTH</u>; the analyses and means.

	CONDITIONS					
	TE-N N-TC TE-TC					
Age:	* N.S.	N.S.	N.S.			
Condition:	N.S.	0.0000	0.0000			
Condition X Age: (Interaction)	N.S.	0.0343	N.S.			

CONDITIONS

		TE	N	N	TC	TE	TC
Age:	Young:	** 3.3	3.4	3.5	2.2	3.4	2.3
<u></u> .	Old:	3.2	3.5	3.1	2.4	3.5	2.6
		N= 80	N= 74	N= 74	N= 78	N= 80	N= 78

\* p level of significance \*\* mean level of agreement



Figure 8. Formal feature question regarding picture changes as being <u>SMOOTH</u> for young and old participants under the time-compressed and normal conditions.

time-compressed by 20%, the perception of smoothness of the edits apparently decreased. Furthermore, the Condition X Age interaction for the TC/N comparision revealed that young adults appeared to be more influenced by pacing in their perception of picture changes. This trend supports the research in aging and neural decay; i.e., aging viewers may see these picture changes smoother due to visual persistence.

<u>Presented too quickly to absorb content</u>. A multivariate analysis of variance applied to the TE/N groups (Table 5) revealed no significant effects of Age, Condition, nor a Condition X Age interaction. Analysis of the TC/N groups revealed no significant effect of Age nor a Condition X Age interaction; there was a significant effect of Condition, F (1/33) = 67.64, p = .0000. Viewers reported that the time-compressed condition was presented significantly too quickly to absorb the content more than under normal conditions.

A similar analysis applied to the TE/TC groups showed no significant effect of Age nor Condition X Age interaction; there was a significant effect of Condition, F (1/38) = 134.49, p = .0000. Both younger and older adults reported that the time-compressed conditions were presented too quickly to absorb the contents.

It was found that the time-extended and the normally paced programs were comparable in being viewed as not being presented too quickly, with the time-compressed programs being viewed as significantly too quickly to absorb the content. The analysis of this variable is consistent with the earlier findings; i. e., time-compression is not considered subtle and it may interfere with the enjoyment and absorbtion of its content.

. *•* 

Formal feature question regarding <u>PRESENTED TOO QUICKLY</u> to absorb the content; the analyses and means.

	CONDITIONS						
	TE-N N-TC TE-TC						
Age:	* N.S.	N.S.	N.S.				
Condition:	N.S.	0.0000	0.0000				
Condition X Age: (Interaction)	N.S.	N.S.	N.S.				

## CONDITIONS

		TE	N	N	TC	TE	TC
<u>Age</u> :	Young:	** 2.1	2.0	1.9	4.1	1.8	4.3
	old:	2.1	2.2	2.1	3.5	2.1	4.0
		N= 80	N= 74	N= 74	N= 78	N= 80	N= 78

\* p level of significance \*\* mean level of agreement <u>Pictures meaningfully illustrated</u>. The three multivariate analyses (Table 6) revealed no significant effects related to this variable. Thus, time-extended, normal and time-compressed programs appeared to be comparable in being viewed as having meaningful pictures.

	TE-N	N-TC	TE-TC		
Age:	* N.S.	N.S.	N.S.		
Condition:	N.S.	N.S.	N.S.		
Condition X Age: (Interaction)	N.S.	N.S.	N.S.		

Formal feature question regarding <u>PICTURES MEANINGFULNESS ILLUSTRATED;</u> analyses and means.

CONDITIONS

#### CONDITIONS

		TE	N	N	TC	TE	TC
<u>Age</u> :	Young:	** 4.0	4.2	4.0	3.6	3.7	3.3
	Old:	4.1	3.9	3.9	3.8	3.9	3.7
		N= 80	N= 74	N= 74	N= 78	N= 80	N= 78

\* <u>p</u> level of significance \*\* mean level of agreement Picture changes (edits) were too abrupt. A multivariate analysis of variance applied to the TE/N groups (Table 7) revealed no significant effects of Age, Condition, nor a Condition X Age interaction. A similar analysis (Table 7) applied to the TC/N groups revealed no significant effect of Age nor Condition X Age interaction. There was a significant effect of Condition, F (1/33) = 43.63, p = .0000. It was found that subjects viewed the edits in the normally-paced programs as less abrupt than those in the time-compressed programs. Similarly, in the analysis for the TE/TC groups, there was also no significant effect of Age nor a Condition X Age interaction; there was a similar significant effect of Condition, F (1/38) = 45.06, p = .0000.

These findings indicate that time-compression results in viewers perceiving edits as too abrupt, with that of time-extended and normally paced programs being comparable in being viewed as having lower levels of abruptness in its picture changes. Thus, time compression may be disconcerting to viewers. Time-extension apparently did not influence viewers' perception of abruptness. One should note that these trends were the same as those found when viewers were asked to rate smoothness of picture changes. Formal feature question regarding <u>PICTURE CHANGES WERE TOO ABRUPT</u>; the analyses and means.

.

	TE-N	N-TC	TE-TC	
Age:	* N.S.	N.S.	N.S.	
Condition:	N.S.	0.0000	0.0000	
Condition X Age: (Interaction)	N.S.	N.S.	N.S.	

. .

		TE	N	N	TC	TE	TC
<u>Age</u> :	Young:	** 2.2	2.2	2.1	3.6	2.4	3.8
	Old:	2.1	2.2	2.2	3.4	2.2	3.8
		N= 80	N= 74	N= 74	N= 78	N= 80	N= 78

\* p level of significance \*\* mean level of agreement .

.

Pictures changed too rapidly. A multivariate analysis applied to the TE/N groups revealed no significant effects of Age, Condition, nor Condition X Age interaction. A similar analysis for the TC/N groups (Table 8) revealed no significant effect of Age; there was a significant effect of Condition, F(1/33) = 97.32, p = .0000, which revealed that viewers perceived the time-compressed pace in programs as being too rapid, as contrasted with normally-paced programs. The Condition X Age interaction was also significant, F (1/33) = 4.22, p = .0481, and is graphically presented in Figure 9. An examination of this interaction revealed that younger viewers preceived the TC (time-compressed) condition as significantly different from older viewers. That is, younger viewers perceived a greater contrast in that pictures changed too rapidly than the older viewers when programs were time-compressed. Both age groups perceived a significant difference between the two conditions, TC (timecompressed) and N (normal).

The analysis for the TE/TC groups showed no significant effect of Age nor a Condition X Age interaction. There was an effect of Condition, F (1/38) = 199.35, p = .0000, with time-compressed programs being considered as significantly containing pictures that changed too rapidly for the enjoyment of both age groups.

These analyses confirm once more that viewers perceive 20% timecompression as too rapid, with the slower-paced, time-extended and normally paced programs being about right. It was found that the timeextended and normally paced programs were comparable in being perceived as not too rapid, whereas the time-compressed programs were viewed as significantly too rapid. Furthermore, in the TC/N analysis and the age contrast within the Condition X Age interaction, younger adults apparently

TE-N N-TC TE-TC \* Age: N.S. N.S. N.S. Condition: N.S. 0.0000 0.0000 Condition X Age: N.S. 0.0481 N.S. (Interaction)

Formal feature question regarding <u>PICTURES CHANGED TOO RAPIDLY</u>; the analyses and means.

CONDITIONS

#### CONDITIONS

		TE	N	N	TC	TE	TC
<u>Age</u> :	Young:	** 2.3	2.3	2.1	4.4	2.0	4.4
	Old:	2.1	2.3	2.1	3.6	2.0	4.1
		N= 80	N= 74	N= 74	N= 78	N= 80	N= 78

\* <u>p</u> level of significance \*\* mean level of agreement viewed time-compression as too rapid more than the older viewers. Also, in the TE/TC analysis, the younger adults (as well as the older adults) viewed time-compression as too rapid. These findings are inconsistent with what was expected in this study, that younger adults wouldn't perceive time-compressed programs as too fast for their taste.



Figure 9. Formal feature question regarding <u>PICTURES CHANGING TOO</u> <u>RAPIDLY</u> for young and old participants under the timecompressed and normal conditions.
Pictures too busy (complex). A multivariate analysis applied to the TE/N groups (Table 9) revealed no significant effects of Age, Condition, nor a Condition X Age interaction. A similar analysis applied to the TC/N groups revealed no significant effect of Age nor Condition X Age interaction. There was a significant effect of Condition, F(1/33) =28.78, p = .0000.Subjects reported that time-compression made the pictures appear too busy to be fully understood. Analysis of the TE/TC groups revealed the same trends; i.e., no significant effects of Age nor Condition X Age interaction, but a significant effect of Condition, F (1/38) = 67.01, p = .0000, again indicating that time-compression resulted in subjects viewing the pictures as too busy or complex to be fully Thus, it was found that the time-extended and the normally understood. paced programs were comparable in being viewed as not being complex, with the time-compressed programs being viewed as significantly more complex or busy; thus time-compression may impede viewers' understanding of the visuals.

# Formal feature question regarding THE PICTURES WERE TOO BUSY OR COMPLEX; the analyses and means

	TE-N	N-TC	TE-TC
Age:	* N.S.	N.S.	N.S.
Condition:	N.S.	0.0000	0.0000
Condition X Age: (Interaction)	N.S.	N.S.	N.S.

#### CONDITIONS

#### CONDITIONS

.

		TE	N	N	TC	TE	TC
<u>Aqe</u> :	Young:	** 1.9	1.8	1.9	3.0	1.9	3.5
	Old:	1.9	1.9	2.1	2.6	2.0	3.3
		N= 80	N= 74	N= 74	N= 78	N= 80	N= 78

\* <u>p</u> level of significance \*\* mean level of agreement

Need to be <u>PHOTOGRAPHED IN BOLDER DETAIL (UP CLOSER)</u>. The analysis of the TE/N groups revealed no significant effects of Age, Condition nor a Condition X Age interaction. A similar analysis applied to the TC/N groups (Table 10) revealed no significant effect of Age nor a Condition X Age interaction. However, there was a significant effect of Condition, F (1/33) = 6.54, p = .0153. Subjects exposed to time-compression reported the need for bolder detail compared with those viewing the programs at normal speed. The same trend occurred in the analysis of the TE/TC groups; only the effect of Condition was significant, F (1/38) = 16.47, p = .0002.

It was found that the time-extended and normally paced programs were comparable in being viewed as having equal amounts of boldness in visual detail, with the time-compressed programs being viewed as significantly less bold in its visual detail. These analyses indicate that timecompression results in viewers wanting more detail or bolder images, perhaps to compensate for the faster pace so that the images can be fully mentally comprehended.

.

# Formal feature question regarding need to be <u>PHOTOGRAPHED IN BOLDER DETAIL</u> (<u>UP CLOSER</u>); the analyses and means.

	TE-N	N-TC	TE-TC		
Age:	* N.S.	N.S.	N.S.		
Condition:	N.S.	0.0153	0.0002		
Condition X Age: (Interaction)	N.S.	N.S.	N.S.		

#### CONDITIONS

#### CONDITIONS

.

		TE	N	N	TC	TE	TC
<u>Age</u> :	Young:	** 2.4	2.6	2.3	2.8	2.5	3.2
	Old:	2.0	2.2	2.3	2.8	2.5	3.1
		N= 80	N= 74	N= 74	N= 78	N= 80	N= 78

\* p level of significance
\*\* mean level of agreement

Presented too slowly to absorb content. The analysis applied to the TE/N groups (Table 11) revealed significant effects of Age, Condition and the Condition X Age interaction. The effect of Age, F (1/36) = 4.61, p = .0386 revealed that younger viewers overall viewed both conditions as too slow as contrasted with older viewers. The effect of Condition, F (1/36) = 7.16, p = .0111, revealed that the TE (time-extended) programs were viewed as too slow compared to the normally-paced programs. The effect of Condition X Age interaction was also significant, F(1/36) = 9.75, p =.0035, and is graphically presented in Figure 10. An examination of this interaction revealed that younger viewers viewed the time-extended pace as significantly different from the normal pace; whereas the older group perceived no difference between normally and time-extended paced programs. Furthermore, under the TE (time-extended) condition there was no difference in the perception between the two age groups; whereas, under the N (normal) condition a significant difference in perception occurred. Older viewers disagreed that normally paced programs were presented too slowly to absorb content, while younger viewers perceived this pace as about right.

The analysis of the TC/N groups revealed significant effects of Age, Condition as well as a Condition X Age interaction. The effect of Age, F (1/33) = 4.67, p = .038, revealed that the younger-aged group perceived the time-compressed programs as not too slowly presented in contrast with the older-aged group. The effect of Condition F (1/33) = 33.65, p = .000, revealed that both young and old groups of adults disagreed that the timecompressed condition was too slowly presented compared to the normally paced programs. The significant Condition X Age interaction, F (1/33) =11.37, p = .0019, is graphically presented in Figure 11.

Formal feature question regarding PRESENTED TOO SLOWLY TO ABSORB CONTENT; the analyses and means.

.

	CONDITIONS							
	TE-N	N-TC	TE-TC					
Age:	* 0.0386	0.038	N.S.					
Condition:	0.0111	0.0000	0.0001					
Condition X Age: (Interaction)	0.0035	0.0019	0.0025					

#### CONDITIONS

		TE	N	N '	TC	TE	TC
<u>Age</u> :	Young:	** 2.6	1.9	2.1	1.2	2.7	1.4
	Old:	1.9	2.0	2.0	1.8	2.1	1.9
		N= 80	N= 74	N= 74	N= 78	N= 80	N= 78

.

\* <u>p</u> level of significance \*\* mean level of agreement

,



Figure 10. Formal feature question regarding the story being <u>PRESENTED</u> <u>TOO SLOWLY TO ABSORB CONTENT</u> for young and old participants under the time-extended and normal conditions.



Figure 11. Formal feature question regarding the story being <u>PRESENTED</u> <u>TOO SLOWLY TO ABSORB CONTENT</u> for young and old participants under the time-compressed and normal conditions.

An examination of this interaction revealed that younger viewers reported a greater and significant contrast in their perception that the story was presented too slowly to absorb content between the timecompressed and normal paced programs. The older viewers perceptions between the two conditions was not significantly different. There was no difference in their perception of the normally-paced programs, however there was a significant difference in perception of the TC (timecompressed) programs. Younger viewers reported disagreeing strongly that TC (time-compressed) programs were presented too slowly to absorb content compared to the older viewers, who reported a mild disagreement that TC (time-compressed) programs were presented too slowly to absorb content.

The analysis of the TE/TC groups revealed no significant effect of Age; there were significant effects of Condition and Condition X Age interaction. The effect of Condition, F (1/38) = 19.12, p = .0001, revealed that older viewers did not report a difference between the two conditions, they disagreed that both time-compressed and time-extended programs were presented equally too slowly to absorb content. The significant Condition X Age interaction, F (1/38) = 10.52, p = .0025 is graphically presented in Figure 12. An examination of this interaction revealed that both younger and older viewers disagreed that TC (time-compressed) programs were presented too slowly to absorb content, with younger viewers disagreeing significantly more strongly than older viewers.

In summary, a progression was found across the 3 pace conditions: the time-extended programs were viewed as the slowest, the normally paced programs as slower, and the time-compressed programs as the fastest. This demonstrates once more that viewers were able to distinguish between the various rates of presentation.



Figure 12: Formal feature questions regarding the story being <u>PRESENTED TOO SLOWLY TO ABSORB CONTENT</u> for young and old participants under the time-extended and time-compressed conditions.

The preceeding analyses of responses to attributes of pace provide considerable support for the reactive theory that formal features such as pace affect viewers' perceptions. The 3 pace conditions were successful, overall, in being viewed as different, even though the content was identical, i.e., formal features do make a difference in perception. Accordingly, this investigation leads to questions regarding program content, (a) do changes in pace influece program enjoyability and (b) affect the learning of its content?

#### Analysis of Enjoyability.

The scores for all the responses to content enjoyability (e.g., "this story was enjoyable", "this story was worthwhile") were summed to produce a total enjoyability score. A multivariate analysis of variance applied to the TE/N groups revealed no significant effects of Age, Condition, nor a Condition X Age interaction. A similar analysis applied to the TC/N groups (Table 12) revealed no significant effect of Age nor a Condition X Age interaction. There was a significant effect of Condition, F (1/33) = 13.67, p = .0008. Overall, subjects enjoyed the normally-paced programs considerable more than the time-compressed programs.

In a similar analysis applied to the TE/TC groups (Table 12), no significant effect of Age nor a Condition X Age interaction were found. There was a significant effect of Condition, F (1/38) = 24.66, p = .0000. Once again, subjects enjoyed the time-extended programs more than the time-compressed programs.

An examination of these 3 analyses revealed that the time-extended and the normally-paced programs were equally enjoyable, with the timecompressed programs being significantly less enjoyable. Age did not Table 12

TOTAL ENJOYABILITY; the analyses and means.

# CONDITIONS

	TE-N	N-TC	TE-TC		
Age:	* N.S.	N.S.	N.S.		
Condition:	N.S.	0.0008	0.0000		
Condition X Age: (Interaction)	N.S.	N.S.	N.S.		

#### CONDITIONS

		TE	N	N	TC	TE	TC
<u>Aqe</u> :	Young:	** 34.8	36.2	34.6	29.1	31.7	24.9
	Old:	34.8	34.6	34.0	30.8	33.2	27.1
		N= 80	N= 74	N= 74	N= 78	N= 80	N=78

\* <u>p</u> level of significance \*\* mean level of agreement

appear to influence the overall enjoyability. The results provided no support for the hypothesis; age level was not differentially related to the enjoyment of differently paced programs, i.e., time-compressed programs were not enjoyed more by young participants and time-extended programs were not enjoyed more by older participants.

#### Analysis of learning

Assuming that older viewers require more time in order to process visual information relative to younger individuals (Phillips & Sternthal, 1977), then television news stories which are slower and presumably visually match older viewers' speed of mental processing should be the most comfortable and should allow more time for learning than programs in which the visual pacing is too rapid (faster than their mental processing speed). Conversely, for young adults, visual pacing which is too slow (slower than their mental processing speed) may be too boring or understimulating, with the result being less enjoyment and concentration and, therefore, less learning relative to programs which are presented at a faster pace. The reverse trend was expected for time-compressed programs.

This hypothesis was tested by three multivariate analyses: total learning (regardless of modality), learning associated with information which was only orally presented, and learning of information which was presented both visually and orally.

<u>Total learning</u>. A multivariate analysis of variance (Condition and Age as the factors) applied to the TE/N groups (Table 13) revealed a significant effect of Age, F (1/36) = 28.75, p = .0000. Younger adults learned more information from both paced programs than did the older adults. The Condition and Condition X Age interaction effects were not

# Table 13

TOTAL INFORMATION learned; the analyses and means.

	TE-N	N-TC	TE-TC		
Age:	* 0.0000	N.S.	N.S.		
Condition:	N.S.	0.0093	0.0000		
Condition X Age: (Interaction)	N.S.	N.S.	N.S.		

#### CONDITIONS

# CONDITIONS

		TE	N	N	TC	TE	TC
<u>Age</u> :	Young:	** 8.4	8.5	7.6	6.4	7.5	6.0
	Old:	6.9	5.7	6.6	5.5	7.5	5.3
		N= 80	N= 74	N= 74	N= 78	N= 80	N= 78

\* <u>p</u> level of significance \*\* mean level of agreement

.

significant.

A similar analysis applied to the TC/N groups (Table 13) revealed no significant effect of Age nor a Condition X Age interaction. However, there was a significant effect of Condition, F (1/33) = 7.62, p = .0093, indicating that viewers learned more information when the stories were presented at a normal pace than at a time-compressed pace.

The analysis applied to the TE/TC groups (Table 13) revealed no significant effect of Age nor a Condition X Age interaction. There was a significant effect of Condition, F (1/38) = 42.36, p = .0000, and again it was found that there was less learning under the time-compressed condition than when programs were time-extended. There was no significant Condition X Age interaction.

An examination of these analyses revealed that time-compression impaired learning of the information contained in news stories for young as well as older adults; learning under the time-extended and normally paced programs was equivalent. Furthermore, it did not appear that timeextension provided any help for older viewers for their overall learning of information when compared to learning in the normally-paced programs. There was some evidence that younger viewers may learn more than older viewers under the time-extended and normal conditions.

Learning of information orally presented. Seven of the informational questions were based on information presented orally (voiceover and narrative). A multivariate analysis of variance applied to these data for the TE/N groups (Table 14) revealed a significant effect of Age, F (1/36) = 19.25, p = .0001. Younger viewers learned more from orally presented material than older viewers. There were no effects of Condition or Condition X Age interaction. A similar analysis applied to the TC/N

# Table 14

# Learning of information <u>ORALLY</u> presented; the analyses and means.

	TE-N	N-TC	TE-TC
Age:	* 0.0001	0.0491	N.S
Condition:	N.S.	0.0005	0.0000
Condition X Age: (Interaction)	N.S.	N.S.	N.S.

#### CONDITIONS

#### CONDITIONS

		TE	N	N	TC	TE	TC
<u>Age</u> :	Young:	** 5.4	5.7	5.2	3.9	5.0	3.9
	Old:	4.5	3.7	4.4	3.1	5.1	3.3
		N= 80	N= 74	N= 74	N= 78	N= 80	N= 78

\* <u>p</u> level of significance \*\* mean level of agreement

groups (Table 14) also revealed a significant effect of Age, F (1/33) = 4.17, p = .0491, which revealed that younger adult viewers learned significantly more from the orally presented information than older viewers. The Condition effect was also significant, F (1/33) = 15.00, p = .0005, indicating that there was more learning with the normally-paced programs than with the time-compressed programs. There was no significant Condition X Age interaction.

A similar analysis applied to the TE/TC groups (Table 14) revealed no significant effect of Age nor a Condition X Age interaction. However, there was a significant effect of Condition, F (1/38) = 34.62, p = .0000, indicating less learning of orally presented information under the timecompressed than under the time-extended condition.

It was found that the time-extended and the normally paced programs were comparable in producing learning from orally presented information, with time-compression significantly reducing the ability to learn orally presented information. The significant effects of age revealed that the younger adults learned more from the stories' oral narrative and descriptive commentary than the older group.

Learning of information orally and visually presented. Three of the informational questions were based on information presented orally (voiceover and narrative) as well as presented visually. A multivariate analysis of variance applied to these data for the TE/N groups (Table 15) revealed a significant effect of Age, F (1/36) = 27.04, p = .0000. Young adults learned more than the group of older adults when the information was presented in two modes (oral & visual). There was no effect of Condition nor a Condition X Age interaction.

72



# Learning of information <u>ORALLY AND VISUALLY</u> presented; analyses and means.

CONDITIONS

	TE-N	N-TC	TE-TC
Age:	* 0.0000	N.S.	N.S.
Condition:	N.S.	N.S.	0.0166
Condition X Age: (Interaction)	N.S.	N.S.	N.S.

CONDITIONS

.

		TE	N	N	TC	TE	TC
Acot	Young:	** 2.9	2.8	2.4	2.6	2.5	2.1
<u>Ade</u> :	Old:	2.4	2.1	2.2	2.4	2.5	2.0
		N= 80	N= 74	N= 74	N= 78	N= 80	N= 78

\* <u>p</u> level of significance \*\* mean level of agreement

A similar analysis applied to the TC/N groups revealed no significant effects for Age, Condition, nor Condition X Age interaction.

The analysis of the TE/TC groups (Table 15) revealed no significant effect of Age nor a Condition X Age interaction. However, there was a significant effect of Condition, F (1/38) = 6.28, p = .0166, indicating that time-compression interfered with learning compared with that under the time-extended condition.

It was found that significantly more learning took place under the time-extended condition than under the time-compressed condition, although no significant increases were found in learning between the time-extended and normally paced programs, or between the normally paced and timecompressed programs.

These analyses lead to two conclusions. First, the faster-paced news stories resulted in less learning of orally and visually presented material when compared with time-extended presentations. Second, young adults may learn somewhat more information than older adults, especially when examining the TE/N contrast. It should be noted, however, that when either time-compressed and time-extended programs were compared to the normally-paced programs, there was no difference in learning; it was only when the two extremes (faster-than-normal versus slower-than-normal) were compared that a difference in learning appeared.

#### Subsidiary Analysis

In order to further elucidate the relationships between the timealteration of news stories and viewers' enjoyment and learning, correlations were computed between the education level of the participants and two media use variables (total TV watched and total news watched) under each of the pace conditions. This was done for the two age groups separately as well as for the two groups combined.

#### Enjoyability of Programs

There were 3 significant correlations between education level and enjoyment of content. For the younger group of participants, there was a significant correlation between educational level and enjoyment under the TC (time-compressed) condition r = .38, p = .02 (Table 16). That is, the higher the level of education of young participants, the more they enjoyed the time-compressed programs. However, under the N (normal) and TE (timeextended) conditions, no significant correlations were found.

For the older group of participants, there was a significant correlation between educational level and enjoyment under the TE (timeextended) condition r = -.37, p = .02 (Table 16); and a significant correlation was also found under the N (normal) condition, r = -.40, p =.02. That is, the higher the level of education of older participants, the less they enjoyed the time-extended and the normally paced programs. Under the TC (time-compressed) condition, there was no significant correlation between educational level and enjoyment.

An examination of the correlations between level of education and enjoyability across the 3 paces of programs revealed an age trend: for older viewers, there was a decreasing relationship between educational

# Table 16

Correlations between educational level and total enjoyability of program, calculated separately for each pace condition.

	Level of Education	hrs. of TV watched	hrs. of News viewing
Young	.05, P=.78	11, P=.51	.27, P=.09
Old	37, P=.02	00, P=1.0	11, P=.50
Total	21, P=.06	06, P=.59	.11, P=.33

# Time-extended

#### Normal

	Level of Education	hrs. of TV watched	hrs. of News viewing
Young	.06, P=.72	.02, P=.93	.19, P=.26
Old	40, P=.02	02, P=.92	.05, P=.79
Total	23, P=.05	.01, P=.9	.12, P=.31

.

#### Time-compressed

	Level of Education	hrs. of TV watched	hrs. of News viewing
Young	.38, P=.02	18, P=.29	13, P=.42
Old	11, P=.50	11, P=.50	.13, P=.46
Total	.07, P=.54	15, P=.19	04, P=.74

level and enjoyment, i.e., as the pace increased from TE (time-extended) and N (Normal) to TC (time-compressed), the correlations decreased; but for younger viewers, the correlations increased. These results indicate that as educational level of viewers increases, there is an increased enjoyment of time-compressed contents. An examination of the results for the combined group (young and old participants) supports this trend; i.e., the correlations shift from negative correlations for the TE (timeextended) and N (normal) conditions to a positive correlation for the TC (time-compressed) condition.

The media use variables (total TV watched and total news watched) were not significantly correlated with educational level for either age group.

#### Learning

There were 3 significant correlations between educational level and total learning. For the older group, there was a significant correlation between educational level and total learning, under the TC (timecompressed) condition r = .36, p = .02 (Table 17). That is, the higher the level of education of older viewers, the more they learned the timecompressed contents. There were no significant correlations under the N (normal) or under the TE (time-extended) conditions. There were no significant correlations for the younger group under any of the 3 conditions.

The combined group of young and old participants revealed 2 significant correlations between level of education and learning. Under the N (normal) condition, the correlation was r = .29, p = .01 (Table 17);

77

#### Table 17

.

Correlations between educational level and total learning, calculated separately for each pace condition.

	Level of Education	hrs. of TV watched	hrs. of News viewing
Young	.16, P=.32	05, P=.76	.18, P=.26
Old	.21, P=.18	04, P=.80	.09, P=.60
Total	.21, P=.07	02, P=.85	.16, P=.15

#### Time-extended

### Normal

	Level of Education	hrs. of TV watched	hrs. of News viewing
Young	.07, P=.69	26, P=.12	.00, P=1.0
Old	.29, P=.08	10, P=.56	.09, P=.61
Total	.29, P=.01	11, P=.33	.10, P=.42

# Time-compressed

	Level of Education	hrs. of TV watched	hrs. of News viewing
Young	.05, P=.76	09, P=.60	18, P=.28
Old	.36, P=.02	08, P=.64	12, P=.48
Total	.26, P=.02	07, P=.56	14, P=.24

and under the TC (time-compressed) condition, the correlation was r = .26, p = .02. That is, for the combined group, the higher the educational level of the participants, the more they learned under the N (normal) and the TC (time-compressed) condition. The combined group under the TE (time-extended) condition, however, revealed no significant correlation.

An important trend emerged when examining these correlations across the 3 pace conditions (Table 17). First, for the older group, the correlations increased from TE  $(r = .21) \rightarrow N$   $(r = .29) \rightarrow TC$  (r = .36), revealing as pace increased, the relationship between educational level and learning increased. Similarly, for the combined group, the correlations under N (normal) and TC (time-extended) conditions were both significant (p = .01 and p = .02, respectively), with that under the TE (time-extended) condition not reaching significance. Thus, it appears that higher levels of education is an advantage in learning for the general population when the news programs are either normally paced or time-compressed.

The media use variables (total TV watched and total news watched) and educational level were not significantly correlated under the three conditions.

#### DISCUSSION

In the present study, it was predicted that the rate of presentation of news stories would influence viewers' enjoyment of the programs and their learning of contents. Their responses to the formal features of time-alteration was also assessed.

The discussion is divided into four sections. First, the major findings will be presented and interpreted. Second, some of the limitations of the study will be outlined, and third, implications for future research will be discussed. Fourth, the implications of the present research for the TV industry will be outlined.

#### Interpretations of Results

It was predicted that aging adults, those between 50 - 75 years of age, would enjoy and learn more contents while viewing slower-paced television news stories than younger adults aged 18 -39 years, with the reverse trend for faster-paced stories.

In this discussion, the major findings are presented regarding total enjoyability, learning, and finally, formal feature assessments. Table 16 presents a summary of all the findings related to pace of the news stories.

#### Table 18

Summary of all analyses, regarding the effects of pacing on the enjoyability of programs, learning, and perceptions of formal features.

TOTAL ENJOYABILITY MEANS	TE = N > TC
LEARNING MEANS	
Total information	TE = N > TC
Oral information	TE = N > TC
Oral & visual information	TE = N = TC
FORMAL FEATURE MEANS	>
Pictures appeared in a natural progression:	TE = N > TC
Pace or speed of the pictures changed too slowly:	TE > N > TC
Pace or speed of the pictures changed too rapidly:	TE = N < TC
Picture changes were too abrupt:	TE = N < TC
Picture changes were smooth:	TE = N > TC
Story was presented too quickly to absorb content:	TE = N < TC
Story was presented too slowly to absorb content:	TE > N > TC
Pictures meaningfully served to illustrate:	TE = N = TC
Pictures were too busy or complex:	TE = N < TC
Should have been photographed in bolder detail:	TE = N < TC

.

,

#### Total Enjoyability

It was predicted that when pacing of programs is slowed (as in timeextension), older viewers' enjoyment may be enhanced, with a reverse trend expected for younger viewers. The results did not support this prediction. It was found that older TV viewers as well as younger viewers enjoyed the contents equally well when the news stories were presented at normal and at time-extended rates. That is, viewers' enjoyment of programs did not significantly increase as the pace was altered. One explanation may be that viewers are accustomed to the normal pace and may, therefore, be used to this pace, thus creating a certain level of comfort. The time-extended pace, though in reality different, may have been perceived as only subtly different; and once viewers have a certain optimum level of enjoyability associated with normal paces, little increase is possible. On the other hand, when the programs were timecompressed, viewers enjoyed the news stories significantly less than those presented either at the normal pace or at the time-extended pace. Two explanations for the decrease in enjoyability are suggested. First, participants were very aware of the time-compressed pace, and since this deviates from their usual experience and enjoyment associated with normally paced news stories, there was a decrease in enjoyment. Second, a combination of viewers' visual information overload (Yoakam & Cremer, 1989) and viewers' inability to process the information (Weiss, 1959; Krull, Watt & Lichty, 1977; Phillips & Sternhal, 1977) over an apparent abnormal timeframe (relative to the normal pace) decreased the potential enjoyability of viewers.

Neither of the age groups enjoyed the faster-paced programs relative to the normally paced and the time-extended programs. Two additional explanations may possibly account for the lack of differentiation between the two age groups. First, the representativeness of the average age of the groups may have influenced the findings. That is, the difference between the age of the groups may not have been sufficiently large enough to manifest significant differences in enjoyability under the three rates of presentation; i.e., although the trends were in the predicted direction, a larger spread between age groups would likely have produced a greater difference in perceptions of enjoyability. For instance, if the composition of the younger group had been younger (e.g., with an average age of 18 years), and the older group had been made up of more elderly participants (e.g., with an average age of 75 years), the assumed difference in information processing speeds and neural capacity between the age groups would likely have resulted in greater differences between the groups in their enjoyability among the three pace conditions. Another factor was the high level of education of the participants; i,e., a majority of participants in both groups had acquired some level of advanced education and may, therefore, not be representative of the population as a whole (e.g., 45% had some college or university education, 19% received a college or university degree, and 13% acquired more than 1 degree). Since higher levels of education are positively correlated with higher abilities of information processing (Krull, et al., 1977), including lower levels of education would likely have increased the variability as well as resulted in lower levels of enjoyability as rate of pace increased. The present study found positive correlations between higher levels of education and enjoyment of time-compression for both age groups, providing further support for this explanation.

83

Second, the active theory of media effects assumes that visual attention to television is largely under the cognitive control of viewers as part of their mental schema (Graesser, Higginbotham, Robertson & Smith, 1978; Pichert & Anderson, 1977; Schank & Abelson, 1977; Anderson & Lorch, 1983). It is possible that people over the years have been exposed to many time-altered media forms (e.g., slow dream sequences in movies, fast TV commercials, format manipulations in Much Music) to such an extent that viewers are now very familiar with these time-alterations and are able to adapt their cognitive thought processes accordingly. Consequently, experienced TV viewers of these time-altered forms may not manifest significantly different responses to various pacing conditions.

There was a trend between viewers' level of education and enjoyability of programs as the pace increased (from time-extended through normal to time-compressed); that is, as the level of education of viewers increased, there was relatively more enjoyment of the faster-paced programs by those with more education, relative to those with less education. This trend occured for each age group. One explanation for this finding may be that as the pace of the information increased, those viewers with higher levels of education were better able to mentally process the programs' content; whereas, viewers with lower levels of formal education may be disadvantaged in their ability to process program contents. This finding is consistent with previous studies on the correlation of information processing and levels of education (Krull et. al. 1977). This inability to more fully process the faster-paced news stories may also influence participants' degree of enjoyability of the programs.

#### Learning of information

Total Learning. It was found that viewers learned equally well when the news stories were presented at a normal pace or at a time-extended pace. However, the time-compression of news stories significantly reduced viewers' learning of the information contents in the programs, when contrasted with stories at the normal pace or time-extended pace. These findings support the assumption that in the normally paced and timeextended programs, there is more time available to learn than in the timecompressed programs, thus more learning is possible. This is consistent with the research on shortened time-spans to process the information (Weiss, 1959; Krull, Watt & Lichty, 1977; Phillips & Sternhal, 1977). Another explanation for the decrease in learning under time-compression may be that viewers grappled with the emotional effects of information overload (Yoakam & Cremer, 1989), resulting in lesser learning. An explanation for the lack of difference in the amount of learning between the normally and the time-extended paces may be that the normal pace already closely matched the mental processing speed of viewers, thus creating an optimum learning situation; therefore, any additional time (as in time-extended) was unnecessary to increase learning efficiency.

In the present study, findings emerged which indicate that when news stories were presented at a normal pace and at a time-compressed pace, viewers with more formal education appeared to learn more information than viewers with lower amounts of higher education. This was not the case with time-extended programs. One explanation may be that those individuals with higher levels of education have repeatedly exercised and honed their abilities to process and comprehend information, thus likely have optimized their use of mental capabilities (Krull, 1977). Consequently, these viewers probably learn more under most conditions. However, when programs are slowed (time-extended), the apparent benefits of well-developed learning abilities in those with higher levels of formal schooling decrease. Thus, presented with sufficient time to learn, as in time-extension, viewers with lower levels of education learned equally well as those with higher levels of formal education. Another way to look at this is that the slower pace may more closely match the mental processing speed of viewers with lower levels of education; thus, they too are capable of mentally processing the information equally well and, therefore, learn to the same degree as those with more formal schooling.

There was no evidence for the prediction that older viewers would learn more information from slower paced news stories than younger viewers. Also slower paced programs did not improve learning for older viewers when compared with normally paced programs. An explanation for these findings is that the normally paced programs presented the information sufficiently slowly for learning to take place, with the additional time available with time-extension being unnecessary. However, when older viewers were presented with information at an accelerated or time-compressed rate, considerably less learning took place, indicating insufficient time for processing and the learning of the information content of the programs.

It was found that in the time-compressed condition, the higher the level of education of older viewers, the more they learned. This finding is consistent with previous research on rate of information processing and education (Krull, et. al., 1977) which revealed that level of education is positively correlated with mental processing speed. Thus, when news stories were presented at an accelerated rate (time-compressed), those individuals with higher levels of formal education appeared better mentally equipped to learn information than participants who had lower levels of education.

The prediction regarding different levels of learning between older and younger viewers was based on research in aging. Previous research has shown that with aging, a reduction in learning proficiency takes place (e.g., Birren, 1974). Other studies have also reported mental declines for older adults in their ability to process information (Weiss, 1959; Krull, Watt & Lichty, 1977; Phillips & Sternhal, 1977). In the present study, it is likely that the older adult group was not sufficiently old enough to reveal the potentially debilitating effects of mental decline on the learning of TV content. Furthermore, 60% of the older group and 95% of the younger group had at least some college or university experience; thus, the age groups cannot be regarded as generally representative of the general population, thereby decreasing the likelihood of finding a difference between the two age groups. Additionally, it is possible that since most people in society have increasingly been exposed to timealterations in their TV viewing (including news), they have adapted to these differing rates of information, especially slow-motion which has been used for several decades in motion pictures and instant replays in television sports. Thus, even with extra time for learning, it may not facilitate additional learning of information.

It was found that younger adults learned more information from programs presented at normal and at time-extended rates than older viewers. These findings are consistent with research (Birren, 1974) on the relationship between aging and information processing abilities. That is, when afforded more than enough time to learn, the younger adults through their faster mental processing speed (faster-thinking) can rehearse and use learning strategies more efficiently than older adults. Another explanation may be that since these younger adults were currently students, their heightened learning skills facilitated their learning of the information presented in the television programs.

The present study found that as the educational level of older viewers increased, the learning of the time-compressed news stories also increased. It appears that viewers with higher levels of education may more easily process the information presented at a faster pace than viewers with lower levels of education. This is consistent with past research (e.g., Krull, Watt & Lichty, 1977) which has found that formal education is positively related to speed of mental information processing. It is possible that the high levels of education, particularly among the group older adults in the present study and who may have cognitive abilities closely matching those of younger adults, reduced the difference in learning between the two age groups.

The design of the present study permitted the total learning to be analyzed through two different modes of learning: learning from the orally (voice-over and narrative) presented information, and learning from the orally and visually presented information.

Learning of orally presented information. The findings regarding the learning of orally presented information are consistent with the analyses of total learning. Information that was orally presented, when time-compressed by 20%, was significantly learned less by viewers than when the pace was normal or time-extended. It is assumed that the increase in speed of the narration did not provide enough time for learning the oral information by both younger and older viewers, thereby reducing the learning compared to the normal and time-extended rates. Under the latter two rates (normal and time-extended), no significant difference in learning appeared to take place. One explanation for this finding is that the normally paced programs presented the oral information sufficiently slowly for learning to take place, with the additional time available in the time-extended pace not being necessary. There were some effects of age. The younger group learned more under normal and time-extended conditions than did the older group. Anyone or a combination of factors may account for this. One is that older viewers may have unknown or uncorrected hearing impairments which could lead to less learning of orally presented information than younger viewers. Α second is that older adults may have diminished capabilities to sustain focused attention on too many stimuli (Kausler, 1982). Consequently, it may be that the sound track of the narration was not sufficiently devoid of other distracting sounds or not adequately louder than the background sounds, thus interfering with the main information being orally presented (Zitter, 1990). A third reason is that the voice qualities may not have been sufficiently high (e.g., distinct) for older viewers. There was no age effect under the time-compressed condition.

Learning of orally and visually presented information There was no significant difference in learning between the time-extended and normal pace, nor was there a significant difference between the normal and timecompressed pace. Only when analysing the two extreme conditions (timeextended and time-compressed) that a significant difference in learning was revealed; i.e., more learning took place in the time-extended than in the time-compressed condition. This finding suggests that timecompression interferes with learning and/or the normal pace does not present information slowly enough to optimize viewers' potential for learning; only when the pace is slowed through time-extension do viewers appear to learn the most. Perhaps, the slower pace of time-extension more closely matches the information processing speed of viewers than either the normal or time-compressed paces.

It was also found that younger adults learned more information than older adults when the programs were slowed from the normal pace to the time-extended pace. An explanation for this finding may be that when an optimal opportunity for learning is presented (as in the time-extended condition), younger viewers without age-reduced competencies can maximize their learning; whereas, older viewers, even under an optimal learning condition (i.e., time-extension) still reveal some information processing deficiencies. These findings are consistent with former research on aging (Weiss, 1959; Krull, Watt & Lichty, 1977; Phillips & Sternhal, 1977), which suggests that with age, speed of mental processing ability declines.

#### Formal features

A major focus of the present study was to explore and gain a better understanding of the impact of one aspect of program form on television viewers of different ages, the rate or visual pace of presentation. The theoretical model for investigating this was based on the framework of reactive theory, which assumes that visual attention to television is maintained, in part, by its structured formal features (Singer, 1980; Winn, 1970; Lesser, 1977; Mander 1978). The present study attempted to confirm this aspect of the theory by demonstrating that visual pacing influences viewers' perceptions of formal features. To examine how pacing affects viewers' responses to pacing, 10 questions were developed along 6 dimensions (Table 16) to measure how their perceptions varied under the three pace conditions and between age groups.

An examination of the overall pattern of results (Table 16) suggests a different pattern of viewers' perceptions as contrasted with previous research (e.g., McLachlan et al, 1978). The 20% time-compression of news stories resulted in 9 out of a possible 10 responses to formal features being significantly different from normally paced and time-extended programs (see Table 16), indicating that time-compression of 20% is not subtle as McLachlan has proclaimed. On the other hand, 20% time-extension of the programs resulted in only 1 out of 10 significant differences from the normally paced programs. Thus, viewers considered this change in pace quite subtle.

Previous researchers (McLachlan, 1979; McLachlan & LaBarbera, 1978; McLachlan & Siegel, 1980) have found that time-compression of TV commercials by 25% was considered subtle. One explanation for the discrepancy between the present study and McLachlan's research may lie in the material being time-compressed (news stories versus commercials, respectively). It may be the case that with longer news stories, the time alteration appears more perceptible to viewers through the longer duration of exposure. Another reason may be that the difference in content between commercials and news programs magnifies the perception of a faster pace; that is, TV commercials are entertaining and are meant to sell products or services to viewers; while TV news is less entertaining and designed to inform. Thus, the former is likely already somewhat faster paced than the latter. Consequently, time-compression may be more noticeable in the news stories than commercials.
The analyses of each formal feature question will now be presented, with each question being presented as it appeared in the questionnaire.

The pictures appeared in a natural progression. Both younger and older viewers perceived the time-compressed condition as being the least natural in its progression of visuals. This suggests that timecompression created an impression that the pictures were not presented in a natural order. An explanation may be that a combination of viewers' visual information overload (Yoakam & Cremer, 1989) and viewers' inability to process the information (Weiss, 1959; Krull, Watt & Lichty, 1977; Phillips & Sternhal, 1977) in an unnatural time-span (relative to the normal rate) distorted the perceptions of the viewers.

Viewers perceived the normal and the time-extended pace as being approximately equal in natural progression. It is likely that the subtlety of the time-extended programs prevented any differentiation between the time-extended and normally paced programs.

The present study also found that viewers responded differently to the three pace conditions according to their age. Older viewers perceived the time-extended news stories as being more natural in progression than the two faster paced presentations (normal and time-compressed). On the other hand, younger viewers perceived the normal rate as being more natural in progression than the time-extended programs. Somewhat different mental processing speeds between the two age groups may account for the difference in perception. That is, previous research (Weiss, 1959; Krull, Watt & Lichty, 1977; Phillips & Sternhal, 1977) suggests that with age a gradual slowing of mental capacities occurs, which may influence older viewers' perception of naturalness. That is, with the slower mental processing abilities being matched by the slower paced programs, the older viewers should perceive the time-extended pace as more natural. On the other hand, younger viewers whose mental processing speeds are faster should perceive the normal pace as being more natural, since it may more closely match their processing speeds.

The pace or speed of pictures changed too rapidly for my taste; the pace or speed of pictures changed too slowly for my taste. These two questions were designed to counterbalance one another in assessing the same formal feature. An examination of the results revealed that viewers perceived the normal and time-extended programs equally fast or not being too rapid; whereas, the time-compressed programs were viewed as too rapid. Consistent with reactive theory, it appears that viewers were quite aware of and influenced by this formal feature. And since this assessment asked viewers to react according to how they felt, it is likely that viewers did not like or enjoy the faster paced programs, a finding consistent with the total enjoyability measure previously discussed. It may be that viewers become frustrated with the faster paced news stories because they are unable to discern and learn from the time-compressed information.

There were also age-related findings. Older viewers disagreed that the pace in the time-extended condition was too slow; in contrast, the younger viewers disagreed that the normal condition was too slow. An explanation of this difference may be due to the difference between the two groups' ability to process information quickly, consistent with previous research on aging (e.g., Birren, 1974), which found that with increased age, a reduction in learning proficiency takes place.

The picture changes (edits) were so smooth I was unaware of these changes; the picture changes (edits) were too abrupt for my comfort. Examining the overall trend in viewers' perceptions of smoothness and abruptness of pace, the results indicated a lack of subtlety in viewers' perception of time-compression; this condition was perceived as being consistently different than the normally paced programs. Both the timeextended and normally paced programs were perceived as smooth or lacking in abruptness of picture changes. The fact that picture changes in the time-compressed news stories were perceived as more abrupt and less smooth could be interpreted as less liked, thus, this finding is consistent with the total enjoyability measure.

Younger adults were found to perceive the picture changes as being less smooth than older viewers in both normally paced and time-compressed programs. Research in sensory psychology has indicated that older people suffer a significant deterioration in the central neural processing system (Walsh, Williams, & Herzog, 1979; Posner & Mitchell, 1967; Kahneman, 1968; Turvey, 1973). It suggests that visual persistence of one image may interfere with the following one, leaving a visual trace superimposed upon the ensuing image, especially if the person is not optimally ready to process the input from the second stimulus (Botwinick, 1982). Thus, in the present study, older viewers whose interval time is shortened to respond to a new stimulus (edit), would likely experience more visual persistence than younger viewers, resulting in a neurally-slowed visual transition from image to image, thereby perceiving the cuts as less abrupt. However, in time-extended

programs both age groups equally perceived the picture changes as being smooth.

The pictures meaningfully served to illustrate the content of the report. No significant findings emerged from this data. There appears to be no relationship between pacing and the meaning of pictures in terms of

their ability to illustrate.

This news story was presented too quickly to absorb the content; this news story was presented too slowly to absorb the content. The findings related to these questions (the measure of slowness and quickness) combined with the findings of total learning (Table 16), reveals viewers'judgements on their opportunities to learn and how much they learned respectively. It was found that the two measures were closely related; i.e., viewers perceived the time-compressed programs as the least likely to absorb program contents from, and they, in fact, did learn the least under time-compression than the other two paced programs.

It was found that viewers, in general, perceived the time-extended pace as the least too slow to absorb content. But when asked if the programs were too quickly presented, the combined group perceived the time-extended and normal pace as being equally paced or reasonably presented to absorb content. The reason for this latter finding may be that viewers' preference for pace is developed for the pace at which news stories are normally presented; and since previous findings in this study suggest that time-extension may be considered only a subtle change, no difference between the normal and time extended pace may be apparent to the viewers.

The age of the viewers was unrelated to their perception of the rate being too fast or slow for learning. The demographic composition of the older group may account for the lack of findings on age difference. That is, the older viewers were mostly well educated and involved in community activities; thus, they were likely physically and mentally active people without any significant decline in mental abilities relative to the younger viewers. In addition, the older group's average age was 59, suggesting that this segment of older viewers was not yet old enough to reveal significant declines and slower mental processing abilities.

It was found that younger viewers perceived a greater contrast among the three paces than the older viewers. This is consistent with previous research with older adults (Kausler, 1982) which suggests that older viewers may have diminished capabilities to sustain focused attention on too many stimuli; whereas, younger viewers have more focused attention and are thus able to better distinguish between the different paces. Another explanation is that older viewers may not perceive the picture edits as distinct as younger viewers. Previous research on sensory psychology suggests that one of the aging effects is a deterioration in the central neural processing system (Walsh, Williams, & Herzog, 1979; Posner & Mitchell, 1967; Kahneman, 1968; Turvey, 1973) and visual persistence (Botwinick, 1982), which suggests that with increased age, some visual persistence occurs, thus resulting in a less visible cuts between visuals (edits) for aging viewers. However, at another level, the perception of contrast among the three paces is inconsistent with previous research findings of subtlety in time-compression (e.g., McLachlan et al., 1978) in that younger viewers did perceive the variation in pacing. One reason for the difference between the present findings and McLachlan's research may be that the materials being time-compressed were dissimilar (news stories versus commercials, respectively). Another explanation may be that the longer exposure to time-compresssion in news stories produced a greater visual impact on viewers.

The pictures were too busy or complex to be fully understood; some items should have been photographed in bolder detail (up closer). The inter-relationship between these two inquiries is integrated in the overall principle of amount of picture information to be decoded by the viewer (Krull, Watt & Lichty, 1977). Too much visual information in a picture (busy or complex) is usually associated with the lack of closeness of detail; and conversely, when pictures are photographed in bolder detail (up closer), relevant visual information is heightened and irrelevant is lessened, thus the pictures are less complicated to understand.

It was found that time-extended and normally paced programs were comparable in amounts of boldness and complexity. This likely indicates that the pictures were not too busy (or too complex) and photographed with sufficient boldness to be fully understood in normally paced programs; and when pace was slowed (time-extended), there could not be much of an increase in understandability. In contrast, the time-compressed programs were reported as significantly more complex and lacking in detail than the normally paced and time-extended programs. This is consistent with the research of Krull, et. al. (1977), which suggests that time-compression interferes with the complete understanding of the visuals presented; i.e., time-compression transforms normal pictures into complex pictures, thereby influencing viewers' perceptions.

In summary, it was expected that the difference in mental processing speeds between the two age groups would have revealed a significant contrast in affective responses to these formal features. The findings did not support this expectation. This lack of effect supports earlier explanations related to the older group not having been sufficiently old to exhibit the assumed aging effects on perception and processing.

The present research findings are consistent with reactive theory, which assumes that visual attention to television is maintained, in part, by its structured formal features (Singer, 1980; Winn, 1970; Lesser, 1977; Mander 1978). Accordingly, this study has found that the formal feature of pace influenced viewers' perceptions of news stories, thus suggesting an interrelationship within the framework of content and form. A change in one element of form may produce a change in the perception of content. In the present study, time-compression of programs was found to impede viewers' understanding of pictures and learning of content. Thus, formal features appear to influence perception, affect viewers' enjoyment of TV programs and have an impact on the learning of program content.

### Limitations of the present study

The following is a discussion of some of the limitations and related issues regarding the present research. This study examined the effect of pace of TV news stories on viewers of different ages; however, in conducting this research, several issues arose which limit the study. They were (1) synthesizing the reactive and active theories, (2) the social-cultural context of the present study, (3) stimulus materials used to do formal feature research, (4) the lack of representativeness of the participants, and (5) the TV viewing setting.

Reactive and active theories. In the development of the present study, the reactive theory was used to compose a questionnaire employing elements from approaches based on the production of television's formal features. That is, TV production theory and practice (reactive) that form the basis of establishing pacing of TV news stories were incorporated (e.g., "the image is left on the screen long enough to make its point and cut at the moment the editor judges that it is made", Reisz & Millar, 1972). The active theory was applied to gauge participants' affective responses to these formal features in the questionnaire (e.g., "the pace or speed of the picture changed <u>too slowly</u> for my taste"). Thus, the present research sought to utilize both active and reactive theories within the experiment. Nevertheless, no research to date appears to fully integrate and synthesize an approach which completely incorporates both theories. The present research is limited in this way.

The social-cultural context. One of the limitations of the present study is the social-cultural context in which this research was conducted. That is, these findings are limited to mostly middle-class, educated white audiences who may have developed particular schemas for selecting TV experiences and the cognitive processing of television's formal features, especially at a rather sophisticated level. Therefore, the findings in this study may not produce similar results in different social-cultural contexts.

Materials. In the development of the three paces, not only was the visual pace altered but also the oral presentation. Thus, it was impossible to isolate the separate effects (if any) of visual pace from that of oral pace. This was due, in part, to technical limitations as well as the nature of the materials. On the other hand, the materials developed for this study are representative of what is broadcast on television. Nevertheless, it is not known whether the time-compression effects found in the present study are due to visual pace, oral pace, or both.

The use of feature news stories may also be a limiting factor in this study. It is possible that if "hard" news stories (e.g., stories about fires or floods) were used, there may have been somewhat different results. Feature news stories are usually longer and slower paced than most hard news stories; and as such, the time compression of the latter may have exaggerated the faster rate, perhaps resulting in the normal and time-compressed programs having similar effects, whereas in the present study, the time-extended and normally paced programs appeared more similar. The decision to alter the materials by 20% compression and 20% extension was primarily based on previous research on TV commercials (McLachlan, et al, 1978), which are likely faster paced as are the hard news stories. In that research, using 25% time-compression, it was purported that time-compression was considered subtle by research participants; they also seemed to enjoy the time compression more than normal commercials. Thus, shorter news stories may have more closely replicated studies of time compression in advertising.

Representativeness of sample. Another limitation was the representativeness of the groups in this study of their respective age groups. That is, the older and younger participants were likely not typical of their age groupings. Out of necessity, more than half of the older group was recruited from college faculty; the younger group was mostly composed of college students. Obtaining a more representative sample for each age group may have provided more significant and generalizable findings.

<u>TV viewing setting</u>. The viewing environments employed in testing the two age groups may have had some influence on the present findings. An attempt was made to produce identical viewing settings; however, some small differences did occur. The conditions for testing the sub-groups of college students (Sub-groups B, C, D and E, Figure 4) was done under completely controlled and identical conditions; i.e., the same room, TV screen, seating arrangements and light levels were used. Similarly, for the older group of college faculty and support staff, a different room yet correspondingly controlled conditions were used for half of those subgroups (sub-groups A, E and F, Figure 4). However, for the remaining two sub-groups of younger adults two home environments were used (subgroups A and F, Figure 4). Thus, two different TV screens, as well as different lighting levels and seating arrangement had to be employed. The remaining three other older groups of participants (subgroups B, C and D, Figure 4) were tested at senior centres, where conditions varied somewhat. Although a careful reconnoitre was done at each facility, these premises were used for many different simultaneous activities; and when testing the older participants of sub-group C, some extraneous noise from another room could be heard. Room light levels were closely duplicated to previous test sessions at the college setting, but the seating arrangements were somewhat different, as participants could not be seated as close as the ideal proposed viewing distance away from the TV screen. Sub-group B was tested under fairly similar conditions to the original college setting; however, different ambient noise levels, various lighting levels could not be avoided in this study due to a lack of control. These minor variations in viewing conditions may have had minor unintentional effects on viewers' perceptions, enjoyment and/or learning.

## Suggestions for future research

The results of the present study have indicated that the altering of TV programs by 20% was quite noticeable for younger and older TV viewers. It is not known whether awareness of time-alteration influences the enjoyment and learning of programs varying in pace. Future research is needed to determine if other rates of time-compression and time-extension (e.g., 5%, 10%, 15%, 25%) may influence how time-compression and timeextension may influence the enjoyment and learning of television presented materials.

The present research should be expanded to include a wider age range of audience. In the present study, it was suggested that the 'young-old' TV viewers closely resembled the younger adults in their ability to process information. Future research should use older participants as well as younger participants; also samples more representative of the age groups should be selected. Similarly; recruiting individuals whose level of education is more representative of the population may provide more generalizable results. Thus, more careful recruitment and selective scrutiny of participants may result in more pronounced pacing effects among the time-altered conditions.

The present research used two-and-a-half minute feature news stories to assess the effects of time-compression and time-extension. Future research is needed using other types of information programming such as the shorter hard news stories and perhaps longer formats like news documentaries. These proposed studies and other research into the formal feature effects of pacing would likely provide a better understanding of the relationships between pacing of TV news and perception, enjoyment and learning in viewers. Investigations using other than information programming to manipulate formal feature research (e.g., entertainment programming, sports) may also provide further evidence on the effects of time-compression and time-extension on viewers' responses.

Only through additional formal feature research using a diverse inventory of television program types and the adoption of positive recommendations by the TV industry can programming be enhanced and TV viewing become more entertaining and informative.

### Implications for the TV industry

There are a number of implications for the TV and advertising industry that can be derived from the present study. These include issues involving audience segmentation, the enjoyability of news, the learning from news, and the use of formal features.

Research has shown that, in the past, advertisers and the television industry in general have avoided segmentation of older audiences between 54 and 65 years of age (BBM, Fall 1986; A.C. Nielson, March, 1986, <u>The</u> <u>Calgary Herald</u>, 1993; Calgary Database Group, 1989); they have combined everyone over 54 into one homogeneous group of "old" people. The results of this study suggest that the 'young-old' TV viewers were not particularly different from younger viewers in their ability to process information. Therefore, the TV industry should reconsider chronological age as a way of audience segmentation. It suggests a shift in the industry's assumptions, particularly of the 'young-old,' with their high levels of discretionary savings, better health and mobility.

The present study found that time-compression significantly reduced the enjoyability of feature news stories; furthermore, it suggests that even fast oral delivery by narrators may be perceived as less enjoyable. Additionally, this research has shown that time-compression reduced learning by younger as well as older viewers; whereas time-extension increased learning by younger viewers but did not do so for older viewers.

Since the TV and advertising industries attempt to maximise TV viewing pleasure, these industries should be more sensitive to the viewing needs of all age segments of an aging population, especially with respect to the formal features of the news programs they watch.

Research has shown that older viewers have a preference for news and

information programming (Rubin & Rubin, 1982; Hasselquest, 1992; Fouts, 1989; Goodman, 1990). This study has attempted to provide further insights into the enjoyment of watching TV for audiences of information programming. For example, the present research found that older viewers perceived the slower-paced news stories as more natural, and that viewers of both age groups appeared to be quite sensitive to alterations in the pacing of TV programs. Time compression was also found to be disconcerting to viewers. These findings suggest that the TV industry should contemplate greater use of time-extension as a way of optimizing viewing pleasure for a greying population and reducing its use of timecompression, especially in news programs.

Research into human aging suggests chronological age as a limited measurement for mental and physical competencies (Rubin and Rubin, 1982), yet the TV industry and TV advertisers appear to endorse this type of audience segmentation (Bureau of Broadcast Measurement, 1986; A.C Nielson Company, 1986). The present study has found some differences between the two age groups, which suggests that greater segmentation of the TV audience and broadcasting to the various segments may ultimately deliver greater numbers in the viewing audience. For example, older well-educated viewers were able to sustain higher levels of learning of information from time-compressed programs than viewers with lower levels of education. This suggests that different types of programs for these two different audiences may serve viewers better and perhaps increase the number of viewers. This study also found that younger viewers learned more than older viewers when the programs were time-extended. Thus, if the TV industry wishes to inform younger viewers, program which are time-extended would seem to serve this segment of the population most appropriately.

Therefore, it appears that more audience segmentation associated with age would result in more audience satisfaction and consequently, provide more viewers for TV industry's programs and advertisers' products.

Professionals, TV editors and producers involved in determining the pacing of TV news stories should be aware of viewers' apparent sensitivity to pacing. The findings of this study indicate that time-compression resulted in viewers perceiving the edits as being too abrupt, that the pictures changed too rapidly and that the pace interfered with their learning or being informed. Furthermore, time-compression resulted in viewers wanting more detail or bolder images; as well, the perception of smoothness of the edits decreased and the visuals were perceived as being presented too quickly to absorb. Time-compressed news stories were also considered as less natural in the progression of its visuals. Therefore, rather than basing the pacing of news stories on TV news editors' own personal judgement (Reisz & MIllar, 1972), they should use their highly refined sense of mental processing to develop programs which optimize the benefits of news stories for an informed and democratic society.

105

#### REFERENCES

- Anderson, D. R. & Bryant J. (1983). Research on Children's Television Viewing: the State of the Art. In J. Bryant & Anderson, D. R. (Eds.), <u>Children's Understanding of Television: Research on</u> <u>Attention and Comprehension</u> (pp. 331-352). New York: Academic Press.
- Anderson, D. R. & Lorch, P. E. (1983). Looking at Television: Action
  or Reaction? In J. Bryant & D. R. Anderson (Eds.), <u>Children's
  Understanding of Television: Research on Attention and
  Comprehension (pp. 1-30). New York: Academic Press.</u>
- Babbie, E. (1989). <u>The Practice of Social Research</u>. Belmont: Wadsworth Publishing Company.
- Barrett, O. B. & Braham, P. (1987). <u>Media, Knowledge and Power</u> (pp. 258). London: Croom Helm.
- Berry, C. (1983). Learning from Television News: A Critique of the Research. Journal of Broadcasting, 27, 359-370.
- Birren, J. E. (1974). Translations in Gerontology from lab to life: Psychophysiology and Speed of Response. <u>American Psychologist</u>, 29, 808 -815.
- Broadbent, D. E. (1977). The Hidden Preattentive Processes. American <u>Psychologist</u>, 32, 109-118.
- Brosius, H. B. (1989). Influence of Presentation Features and News Content on Learning from Television News. <u>Journal of Broadcasting</u> <u>& Electronic Media</u>, 33, 1-14.
- Brosius, H. B. (1991). Format Effects on Comprehension of Television News. <u>Journalism Quarterly</u>, 68, 396-401.

Burdach, K. J. (1983). Methodological aspects of formative

research. In M. Meyer (Ed.), Children and the Formal

<u>Features of Television</u> (pp. 310-329). München: K. G. Saur Verlag KG.

- Burder, J. (1970). <u>The Technique of Editing 16mm Films</u>. (pp.9-12). New York: Hastings House.
- Burrows, T. D., Wood, D. N. & Gross, L. S. (1992). <u>Television</u> <u>Production Disciplines and Techniques</u>. Dubuque: Wm. C. Brown.
- CMP., (1989). Calgary Database Consumer Groups. (unpublished).
- Davis, B. & French, W. A. (1989). Exploring advertising usage segments among the aged. <u>Journal of Advertising Research</u>, Feb./March, 22-29.
- Dawson, G., "Provocative shows can't satisfy audiences." <u>The Calgary</u> <u>Herald</u>, 27 February, 1993.
- Del Guercio, A. (1984). <u>The Effects of Time-Compression on</u> <u>Observational Learning and Rate of Imitation in Children</u>. M. A. Thesis., University of Calgary.
- Dimmick, J. W., McCain, T. A. & Bolton, W. T. (1979). Media use and the life span. <u>American Behavioral Scientist</u>, 23, 7-31.
- Dominick, J. R. & Fletcher, J. E. (1985). <u>Broadcasting Research</u> <u>Methods</u>. Toronto: Allyn and Bacon, Inc.
- Dorion, J. (1993). "Going Grey." <u>The Calgary (Alberta) Herald</u>, April 25, Sec. F, pp 2.
- Drew, D. G. & Cadwell, R. (1985). Some Effects of Video Editing on Perceptions of Television News. <u>Journalism Quarterly</u>, Winter, 828-831.

- Edel, R. (1988). American Dream Vendors, <u>Advertising Age</u>, Nov. 9, 153-156.
- Fouts, G.T. & Flessati, E. (1983, June). <u>Time-compressed television</u> <u>programs and children's attention</u>. Paper presented at the American Association for Advancement of Science (Pacific Division), Logan, Utah.
- Fouts, G. T., & Abraham, R. (1986, June). <u>Self Concept and Television</u> <u>Viewing in the Elderly</u>. Paper presented at the Canadian Communications Association Conference, Winnipeg, Manitoba.
- Goodman, E. I. (1990). Television News Viewing by Older Adults. Journalism Quarterly, 67, 137-141.
- Gunter, B. (1980). Remembering television news: Effects of picture content. <u>The Journal of General Psychology</u>. 102, 127-134.
- Hardy, F. (1966). <u>Grierson on Documentary</u>. Great Britain, London, Faber and Faber.
- Hasselquest, A. H. (1992). <u>Older Adults and Television Use</u>. M. A. Thesis., University of Calgary, January.
- Heatherton, T., & Fouts, G. T. (1985, May). <u>Television and the Older</u> <u>Viewer: Effects of Changes in the Visual and Auditory Systems</u>. Paper presented at the International Communications Association, Honolulu, Hawaii.
- Hitchcock, A. (1937). Direction. In R. D. MacCann (Ed.), <u>Film a Montage</u> of Theories (pp.23-37). New York: E. P. Dutton & Co. Inc.

- Huston, A. C. & Wright, J. C. (1983). Children's Processing of
- Television: The Informative Functions of Formal Features. In J. Bryant & D.R. Anderson, D. R. (Eds.), <u>Children's Understanding of</u> <u>Television: Research on Attention and Comprehension</u> (pp. 35-65). New York: Academic Press.
- Jennings, P. (1993). "More people get their news from ABC-TV than any other source." "<u>ABC-TV'S WORLD NEWS</u>," June 11, 7:30 PM.
- Katz, E., Adoni, H. & Parness, P. (1977). Remembering the News: What the Picture Adds to Recall. <u>Journalism Quarterly</u>. Summer, 231-239.
- Katz, E., Blumler, J. G. & Gurevitch, M. (1974). Uses and Gratifications Research. <u>The Public Opinion Quarterly</u>, Winter, 510-523.
- Kausler, D. H. (1982). <u>Experimental Psychology and Human Aging</u>. pp. 280 - 342. Toronto: John Wiley & Sons.
- Kippax, S. & Murray, J. P. (1980). Using the Mass Media: Need Gratification and Perceived Utility. <u>Communication Research</u>, 7, 335-360.
- Korzenny, F. & Neuendorf, K. (1979). Television Viewing and Self-Concept of the Elderly. <u>Journal of Communication</u>, 30, 71-80.
- Krull, R. (1983). Children Learning to Watch Television. In J. Bryant & D. R. Anderson (Eds.), <u>Children's Understanding of Television:</u> <u>Research on Attention and Comprehension</u> (pp. 103-121). New York: Academic Press.
- Krull, R., Watt, J. & Lichty, L. (1977). Entropy and Structure. <u>Communication Research</u>. Jan., pp. 83.

Kubey, R. (1986). Television Use in Everyday Life: Coping with Unstructured Time. <u>Journal of Communication</u>, Summer.

- Lawson, J. H. (1967). <u>Film: The Creative Process</u>. pp. 295-307. New York: Hill & Wang.
- Levin, G. (1991). Boomers leave a challenge. <u>Advertising Age</u>, July 8, pp. 1-14.
- MacCann, R. (1966). <u>Film: a Montage of Theories</u>. New York: E.P. Dutton & Co., Inc.
- MacLachlan, J. (1979, November). What people really think of fast talkers. <u>Psychology Today</u>. pp. 7076.
- MacLachlan, J. & La Barbera, P. (1978). Time-compressed T.V. commercials. Journal of Advertising Research, 18, 11-15.
- MacLachlan, J., & Siegel, M. H. (1980). Reducing the cost of T.V. commercials by use of time compression. <u>Journal of Marketing</u> <u>Research</u>, 17, 52-57.

Manvell, R. (1955). <u>The Film and The Public</u> (pp. 43-75). Great Britain, Harmondsworth, Middlesex: Penguin Books Ltd.

- McQuail, D., (1975). <u>Towards a Sociology of Mass Communication</u>. New York: The Macmillan Publishing Co. Inc.
- Milliman, R. E. & Erffmeyer, R. C. (1990). Improving Advertising Aimed at Seniors. <u>Journal of Advertising Research</u>. Dec./Jan., 31-36.
- Perry, G. (1968). The Master's Voice. <u>The Sunday Times</u>, London, England, Oct. pp. 74-81.
- Phyllips, L. W. & Sternthal, B. (1977). Age Differences in Information Processing: A Perspective on the Aged Consumer. <u>Journal of</u> <u>Marketing Research</u>, Vol. XIV, 444-455.

- Pudovkin, V. I. (1950). The Plastic Material. In R. D. MacCann (Ed.), <u>Film a Montage of Theories</u> (pp.23-37). New York: E. P. Dutton & Co. Inc.
- Reisz, K. & Millar, G. (1972). <u>The Technique of Film Editing</u>. New York: Hastings House.
- Rice, M. L., Huston, A. C. & Wright, J. C. (1983). The forms of television: Effects on children's attention, comprehension, and social behavior. In M. Meyer (Ed.), <u>Children and the Formal</u> <u>Features of Television</u> (pp. 21-55). München: K. G. Saur Verlag KG.
- Robinson, J. P. (1971). Television and Leisure time: A New Scenario. <u>Communication</u>, 31, 121-130.
- Rubin, A. & Rubin, R. (1981). Age, Context and Television Use. Journal of Broadcasting, 25:1, 1-13.
- Rubin, A. & Rubin, R. (1982). Contextual age and television use. <u>Human Communication Research</u>, 8, 228-244.
- Russel, W. (1984). <u>The Aging Experience</u>. San Francisco: Harper & Row.
- Salomon, G. (1983). Beyond the formats of television: The effects of student preconceptions on the experience of televiewing. In M. Meyer (Ed.), <u>Children and the Formal Features of Television</u> (pp. 209-227). München: K. G. Saur Verlag KG.
- Salomon, G. (1979). Shape, not only content: How media symbols partake in the development of abilities. In E. Wartella (Ed.), <u>Children Communicating: Media and Development of Thought, Speech,</u> <u>Understanding</u> (pp. 53-82). Beverly Hills, California: Sage Publications, Inc.

Salomon, G. (1987). The Use of Visual Media in the Service of

- Enriching Mental Thought Processes. In O. B. Barrett & P. Braham (Eds.), <u>Media, Knowledge and Power</u>. Beckenham, Kent (G. B.). pp. 251-265.
- Sennet, M. (1954). Cloud-Cuckoo Country. In R. D. MacCann (Ed.), <u>Film</u> <u>a Montage of Theories</u> (pp.160-170). New York: E. P. Dutton & Co. Inc.
- Stone, V. and Hinson, B. (1978). <u>Television Newsfilm Techniques</u>. New York: Hastings House.
- Thomson, L. (1989). Comparing Nielson's and AGB's People-Meter Ratings: A Natural Experiment in Sampling. <u>Journal of</u> <u>Advertising Research</u>, Aug./Sept., 8-12.
- Vorkapich, S. (1959). Toward True Cinema. In R. D. MacCann (Ed.), <u>Film</u> <u>a Montage of Theories</u> (pp.23-37). New York: E. P. Dutton & Co. Inc.
- Watt, J. H. Jr. & Welch, A. J. (1983). Effects of Static and Dynamic Complexity on Children's Attention and Recall of Televised Instruction. In J. Bryant & d. Anderson (Eds.), <u>Children's</u> <u>Understanding of Television: Research on Attention and</u> <u>Comprehension</u> (pp. 69-100). New York: Academic Press.
- Weiss, W. (1971). Mass Communication. In P. Mussen & M. R. Rosenzweig (Eds.), <u>Annual Review of Psychology</u> (pp. 309-336). Palo Alto: Annual Reviews Inc.
- Wigdor, B. T. & Foot, D. K. (1988). <u>The Over-Forty Society</u>. Toronto: James Lorimer & Company.

l

- Woodall, W. G., Davis, D. K. & Sahin, H. (1983). From the Boob Tube to the Black Box: Television News Comprehension from an Information Processing Perspective. <u>Journal of Broadcasting</u>, 27, 1-23.
- Wright, J., et. al. (1984). Pace and continuity of television
  programs: Effects on children's attention and comprehension.
  <u>Developmental Psychology</u>, 20, 653-666.
- Yoakum, R. D. & Cremer, C. F. (1989). <u>ENG: Television News and The</u> <u>New Technology</u>. New York: Random House.
- Zitter, M. (1990). For seniors, by design. <u>Advertising Age</u>, Vol. 61, 20, pp. 28.

## APPENDIX A

TV news story program description

"Working in the 90's: Friends of the Family"

This feature news story was part of an ongoing series called "Working in the 90's". It told the story about a unique community program in Calgary that was based on the popular small town notion of bartering. The program coordinator explained that it provided a service for people with something to give in exchange for a skill or service they needed.

It also featured two people who had taken advantage of this program. It showed how an elderly lady taught a young boy how to read music and play the piano, in exchange the boy was seen doing chores for the lady. They each spoke briefly on camera about the merits of the exchange. The reporter highlighted the main areas of the exchange and reinforced some of the other benefits of the program such as connecting people with similar interests and providing company for people who were lonely. All subjects in the story were shown in realistic settings, which appeared to provide a sense of authenticity.

### APPENDIX B

## TV news story program description

"Working in the 90's, SAIT II"

This feature news story centred around a novel federal job creation program called Canadian Job Strategies. It showed how 20 female apprentice carpenters were taking courses at a technical institute to try to qualify them for 'journeyman' status. The reporter illustrated the visual paradox of seeing purses and carpenter's planes and also explained that for most of the women in the program, it meant the accomplishment of becoming a higher wage earner.

The story's focused on one female participant who was a former geologist enrolled in the program. In an interview she explained that she was layed off and that she was looking for something completely different, thus setting the tone for a changing job market in the 1990's. In this story the women were shown in various typical carpenter's tasks using a variety of tools in nailing and sawing, it thus created the impression of realism.

#### APPENDIX C

#### UNIVERSITY OF CALGARY

# COMMUNICATION STUDIES 112

#### RESEARCH PROJECT

#### CONSENT FORM

Television news is one of the most compelling ways for people to obtain their information about their community, country and world. TV stations and networks constantly try to satisfy and improve viewers' enjoyment and understanding by providing a variety of news stories of local and regional interest as well by using different production techniques.

The purposes of the present research are to provide feedback to TV journalists regarding (a) how viewers respond to their news stories, and (b) which kinds of viewers like which kinds of news presentations.

This is a <u>voluntary project</u>. You should feel free not to participate, to withdraw at any time, or to refuse to answer any particular question(s). Every measure has been taken to protect your anonymity as you will NOT enter your name, Student ID no., phone number, or any other personal unique identifier on the questionnaire. This project has been approved by the University of Calgary Research Ethics Committee.

I, (Please print) \_\_\_\_\_\_ understand the nature of the above study and wish to participate. I understand that I may withdraw at any time and for any reason without penalty. I also understand that the general results of the study will be made available in approximately two months.

Your signature on this form indicates that you have understood to your satisfaction the information regarding your participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the investigators or involved institutions from their legal and professional responsibilities. If you have any questions concerning your participation in this project, please contact The University of Calgary Research Services (220-3782) and ask for the Chair of the Conjoint Areas Research Ethics Committee.

SIGNATURE: DATE:

Bert Leemburg (220-6357), Graduate Student, Communication Studies Program Dr. G. Fouts (220-5561), Professor, Department of Psychology 116

QUESTIONNAIRE PART I

INSTRUCTIONS:
Please use check marks [ $\checkmark$ ] to indicate your answers, or fill in the blanks.
DEMOGRAPHIC INFORMATION
GENDER: MALE FEMALE
BIRTHDATE:
EDUCATION: Indicate the highest level of education you have reached to date:
Less than Grade XII High School
High School Diploma
Some College or University courses
College or University Degree
More than one degree
Other, please specify:
OCCUPATION: Check the category that best describes your current occupational status:
University/College student
Homemaker
Professional, teacher, lawyer, doctor, manager, or businessperson
Trades, maintenance, labourer, mechanic, machine operator
Sales, clerical
Unemployed
Retired
Your occupation may not be listed here, please write in your occupation here:
Other, please specify:

.

.

.

1. HOW MANY TELEVISION SETS are presently in your home?

\_\_\_\_ One

\_\_\_\_\_ Two

\_\_\_\_\_ Three

More than three

2. Estimate HOW MANY HOURS DAILY you watch TV.

On EACH WEEKDAY (Monday - Friday): \_\_\_\_\_\_ hours. On EACH WEEKEND DAY: Saturdays: \_\_\_\_\_\_ hours. Sundays: \_\_\_\_\_\_ hours.

3. Do you presently subscribe to any TV Cable service?

\_\_\_\_ Yes \_\_\_\_ No, if "No", please skip questions 4, 5, 6, 7 and go to question 8.

4. Do you EVER watch CBC's Newsworld?

Yes \_\_\_\_ No, if "No", please skip questions 6 & 7 and go to question 8.

5. Do you EVER watch CNN?

Yes \_\_\_\_ No, if "No", please skip questions 6 & 7 and go to question 8.

.

6. HOW MANY HOURS DAILY do you USUALLY watch News on Cable TV?

\_\_\_\_\_ hours each weekday.

\_\_\_\_ hours on Saturdays.

\_\_\_\_ hours on a Sundays.

7. HOW MANY HOURS DAILY do you watch CBC's Newsworld?

\_\_\_\_\_ never

\_\_\_\_ hours each weekday

\_\_\_\_\_ hours on Saturdays

\_\_\_\_\_ hours on Sundays

- 8. HOW MUCH TIME IS SPENT watching <u>news on television</u> (all news, including cable & non-cable)?
  - hours each weekday
  - hours each Saturday
  - \_\_\_\_\_ hours each Sunday
- 9. WHEN do you usually watch the news (you may check as may as many as apply to you):
  - \_\_\_\_\_ early in the morning
  - \_\_\_\_\_ midday
  - \_\_\_\_\_ at supper time
  - \_\_\_\_\_ late evening
  - \_\_\_\_\_ throughout the day
  - \_\_\_\_\_ other, please specify: \_\_\_\_\_\_
- 10. WHICH TV CHANNELS do you watch your news on? (you may check as many as apply to you):

٠.

- \_\_\_\_ Channels 2 & 7, CFAC-TV
- \_\_\_\_ Channels 4 & 5, CFCN-TV
- \_\_\_\_\_ Channels 9 & 6, CBC-TV
- \_\_\_\_\_ U.S. Channels
- \_\_\_\_ Don't know the channel(s)
- \_\_\_\_\_ Other, please specify: \_\_\_\_\_\_

PART II

THIS IS A BRIEF PRACTICE QUESTIONNAIRE TO FAMILIARIZE YOU WITH THE FORMAT OF THE UPCOMING QUESTIONNAIRE.

Have you ever seen this particular news story on television before?

Yes No Not sure/don't know

PLEASE INDICATE HOW YOU  $\underline{\text{FEEL}}$  About the  $\underline{\text{content}}$  of the news story you just viewed:

1. This news story was very **EMOTIONALLY INVOLVING** for me.

Stro Disa	ngly Igree		Disa	gree		Unde	cided		Ag:	ree		Str Agr	ongly ee
[	]		[	]		[	]		[	]		ſ	]
2.	This	news	story	was	very	IMPOR	TANT t	o me.					
Stro Disa	ngly gree		Disa	gree		Unde	cided		Ag	ree		Str Agr	ongly ee
[	]		[	]		[	]		[	]		ĺ	]
з.	This	news	story	was	very	INFOR	MATIVE	for me	•				
Stro Disa	ngly gree		Disa	gree		Unde	cided		Ag:	ree		Str Agr	ongly ee
ĺ	]		ſ	]		ľ	3		[	]		ĺ	]
PLEA STOF	ASE IN RY YOU	IDICAI J JUSI	fe how f view:	YOU ED.	<u>FEEL</u>	ABOUT	THE <u>P</u>	RODUCTIO	ON S	<u>rechni</u>	<u>DUES</u> II	1 TH	e news
1.	The r these	pictur e char	ce chai nges.	nges	(edit	:s) <u>WE</u>	RE SO	SMOOTH 1	that	t I was	s unawa	are	of
Stro Disa	ngly Igree		Disa	gree		Unde	cided		Ag:	ree		Str Agr	ongly ee
[	]		ĺ	]		[	]		[	]		[	]
2.	The p	pace c	or spe	ed of	f the	pictu	res ch	anged <u>T</u> (	00	SLOWLY	for my	y ta	ste.
Stro Disa	ngly		Disa	gree		Unde	cided		Ag	ree		Str Agr	ongly ee

3. The pictures MEANINGFULLY SERVED TO ILLUSTRATE the content of the news report.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
[]	[]	[]	[]	[]

BELOW ARE 3 MULTIPLE CHOICE QUESTIONS TO SEE HOW MUCH YOU REMEMBER FROM THE PROGRAM. PLEASE CIRCLE THE CORRECT ANSWER:

- 1. What company did Doug Hislop work for before starting his new model airplane business.
  - a. Imperial Esso
  - b. Shell Canada
  - c. Petro Can.
  - d. Amoco
- 2. What was the colour of the model airplane last seen in this news story?

.

.

- a. Yellow
- b. Green
- c. Blue
- d. Red
- 3. What was the name of the new company that was started?
  - a. Model Airplanes Inc. b. R.C. Hanger

  - c. Calgary Model Airplanes
  - d. The Calgary Hanger

(Students)

Have you ever seen this particular news story on television before?

\_\_\_\_ Yes \_\_\_\_ No \_\_\_ Not sure/don't know

PLEASE INDICATE HOW YOU <u>FEEL</u> ABOUT THE <u>CONTENT</u> OF THE NEWS STORY YOU JUST VIEWED:

1. This news story was very **ENJOYABLE** to me.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
[]	[]	[]	[]	[]

2. This news story was very <u>INFORMATIVE</u> for me.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
[]	[]	[]	[]	[]

3. This news story was very <u>IMPORTANT</u> to me.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
[]	[]	[]	[]	[]

4. This news story was very **INTERESTING** to me.

•

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
[]	[]	[]	[]	[]

5. This news story was very **EMOTIONALLY INVOLVING** for me.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
[]	[]	[].	[]	[]

6. This news story was very WORTHWHILE to me.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
[]	[ ]	[]	[]	[]

7. This news story was very <u>RELEVANT</u> for me.

.

.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree			
[]	[ ]	[]	[]	[]			
8. This	news story was ver	y <u>UNDERSTANDABLE</u>	to me.				
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree			
[]	[ ]	[]	[]	[]			
9. This	news story was very	MOTIVATING for m	e.				
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree			
[]	[]	[]	[]	[]			
10. Thi:	s news story <u>CREATE</u>	D A NEW AWARENESS	in me.				
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree			
[]	[]	[]	[]	[]			

.

.

.

PLEASE INDICATE HOW YOU FEEL ABOUT THE PRODUCTION TECHNIQUES IN THE NEWS STORY YOU JUST VIEWED.

.

1. The pictures appeared IN A NATURAL PROGRESSION. Strongly Disagree Undecided Strongly Agree Disagree Agree [ ] [] [ ] [ ] [ 1 2. The pace or speed of the pictures changed TOO SLOWLY for my taste. Strongly Disagree Undecided Agree Strongly Disagree Agree [] [ 1 [ ] ſ 1 [ ] The picture changes (edits) WERE SO SMOOTH that I was unaware of 3. these changes. Strongly Disagree Undecided Agree Strongly Disagree Agree [] [ ] [ ] [ ] Ε ] 4. This news story was presented TOO QUICKLY to absorb the content. Strongly Disagree Undecided Agree Strongly Disagree Agree [] [ ] E ] [ ] [ ] 5. The pictures MEANINGFULLY SERVED TO ILLUSTRATE the content of the report. Strongly Disagree Undecided Strongly Agree Disagree Agree [ ] ſ 1 ſ 1 [ ] [ ] 6. The picture changes (edits) were TOO ABRUPT for my comfort. Strongly Disagree Undecided Agree Strongly Disagree Agree [ ] [ ] [ ] [ ] [] 7. The pace or speed of the pictures changed <u>TOO RAPIDLY</u> for my taste. Strongly Disagree Undecided Agree Strongly Disagree Agree [] ] ] [ ] [ ] [ 1

8.	The p	pictur	es <u>WEI</u>	RE TO	DO BUSY	OR	COMPLEX	<u>(</u> to be	fu	lly ı	understo	ood.	
Stro Disa	ongly Igree		Disag	gree	Ţ	Unde	cided		Ag	ree		Str Agr	ongly ee
[	]		[	]		[	]		[	]		ĺ	]
9.	Some CLOSI	items ER).	s shou	ld ha	ave beer	n ph	otograg	phed in	BO	LDER	detail	( <u>UP</u>	
Stro Disa	ongly Igree		Disaq	gree	I	Unde	cided		Ag.	ree		Str Agr	ongly ee
ĺ	]		[	]		[	]		[	]		[	]
10.	This	news	story	was	present	ted	TOO SLO	WLY to	ab	sorb	the cor	ntent	•
Stro Disa	ongly Igree		Disagı	ree	U	ndec	ided		Ag	ree		Stro Agre	ngly e
[	]		ſ	]		[	]		[	]		[	]

.

125

BELOW ARE 10 MULTIPLE CHOICE QUESTIONS TO SEE HOW MUCH YOU REMEMBER FROM THE PROGRAM. PLEASE CIRCLE THE CORRECT ANSWER:

1. Where were the students studying?

a. University of Calgary

- b. a local manufacturing company
- c. Alberta Vocational Centre
- d. SAIT
- 2. What item was prominently displayed in the very first picture in the program?
  - a. a saw
  - b. a hammer
  - c. a purse
  - d. a plane
- 3. What did many of the students call the tools before studying carpentry?
  - a. what-cha-ma-call-its
  - b. thing-a-ma-jigs
  - c. doo-dads
  - d. thing-a-ma-bobs
- 4. What type of students were taking carpentry in this apprenticeship program?
  - a. only women
  - b. only women on unemployment insurance
  - c. men and women
  - d. women and high school graduates
- 5. Which government program was paying these students to be in this program?
  - a. Canada Manpower
  - b. Canadian Job Strategies
  - c. Department of Immigration d. Hire a Student
- The feature student (from England) was wearing a white helmet and 6. a grey sweater for the interview. What profession did she say she had before becoming a carpentry student?
  - a. a sales clerk
  - b. a homemaker
  - c. a geologist
  - d. a geophysicist

- 7. According to the program, what is the starting or entry level wage for a carpenter?
  - a. \$ 5 7 per hour b. \$ 8 10 per hour c. \$ 12 14 per hour d. over \$20 per hour
- 8. After taking the course in carpentry, how long will they have to obtain practical experience before they start looking for regular employment?

a. 6 monthsb. 1 yearc. 4 weeks d. 1 month

- 9. What percentage of students have already been successful in lining up employment?
  - a. zero, none b. 10% c. 50% d. 25%
- 10. What was the name of the TV Reporter?
  - a. Barbara Higgens
  - b. Linda Olson

. .

- c. Sandra Janson d. Kelly Johnston

.
(Music)

.

Have you ever seen this particular news story on television before?

\_\_\_\_ Yes \_\_\_\_ No \_\_\_\_ Not sure/don't know

PLEASE INDICATE HOW YOU  $\underline{\text{FEEL}}$  About the  $\underline{\text{content}}$  of the news story you just viewed:

.

1. This news story was very **ENJOYABLE** to me.

			1		1								
Stro Disa	ongly agree		Disa	gree		Unde	cided		Agı	ree	S	stro Igre	ongly ee
[	]		[	]		ſ	]		[	]		[	]
2.	This	news	story	was	very	INFOR	MATIVE	for me.	•				
Stro Disa	ongly agree		Disag	gree		Unde	cided		Agı	ree	S	stro Igre	ongly ee
[	]		[	]		[	]		[	]		[	]
з.	This	news	story	was	very	IMPOR	TANT to	o me.					
Stro Disa	ongly agree		Disag	gree		Unde	cided		Agı	ree	S	stro Igre	ongly e
ĺ	]		[	]		[	]		[	]		[	]
4.	This	news	story	was	very	INTER	<u>ESTING</u>	to me.					•
Stro Disa	ongly agree		Disa	gree		Unde	cided		Agı	ree	S	stro Igre	ongly ee
[	]		[	]		ĺ	]		[	]		[	]
5.	This	news	story	was	very	EMOTI	ONALLY	INVOLVI	<u>ING</u>	for me.			
Stro Disa	ongly agree		Disa	gree		Unde	cided		Agı	ree	S A	stro Igre	ongly e
ſ	]		ĺ	]		[	]		[	]		[	]
6.	This	news	story	was	very	WORTH	WHILE t	to me.					

 Strongly
 Disagree
 Undecided
 Agree
 Strongly

 Disagree
 []
 []
 []
 []

7. This news story was very <u>RELEVANT</u> for me.

Stron Disag	ngly gree	Disagree			Undecided				Agree			Strongly Agree			
ĩ	]		I	[	]			[	]		[	]		[	]
8. 2	This	news	stoi	сy	was	very	<u>UNDI</u>	ERS	STANDAB	<u>LE</u> to r	ne.				
Stron Disag	ngly gree		Dis	sag	gree		Uno	deo	cided		Agı	cee		Str Agr	ongly ee
ſ	]		1	[	]			[	]		[	]		[	]
9. TI	9. This news story was very MOTIVATING for me.														
Stron Disag	ngly gree		Dis	sag	gree		Uno	dec	cided		Agı	cee		Str Agr	ongly ee
[	]		l	[	]			[	]		[	]		l	]
10.	This	news	s sto	ory	CRI	EATED	A NI	EW	AWAREN	ESS in	me.	•			
Stro Disa	ngly gree		Dis	sag	gree		Uno	deo	cided		Agı	ree		Str Agr	ongly ee
[	]		I	[	]			[	]		ſ	]		ſ	1

.

.

.

,

.

PLEASE INDICATE HOW YOU FEEL ABOUT THE PRODUCTION TECHNIQUES IN THE NEWS STORY YOU JUST VIEWED.

1. The pictures appeared IN A NATURAL PROGRESSION. Strongly Disagree Undecided Strongly Agree Disagree Agree [ ] [ ] [ ] ſ 1 [ 1 2. The pace or speed of the pictures changed TOO SLOWLY for my taste. Strongly Disagree Undecided Agree Strongly Disagree Agree [] [ ] [] · ſ 1 [ 1 The picture changes (edits) WERE SO SMOOTH that I was unaware of 3. these changes. Strongly Disagree Undecided Agree Stronalv Disagree Agree [] [ ] [ 1 [ 1 ] [ 4. This news story was presented TOO QUICKLY to absorb the content. Strongly Disagree Undecided Strongly Agree Disagree Agree [ ] [ 1 [ ] ] 1 [ ] The pictures MEANINGFULLY SERVED TO ILLUSTRATE the content of the 5. report. Strongly Disagree Undecided Agree Strongly Disagree Agree [ ] ſ ] ] [ E 1 [ ] 6. The picture changes (edits) were TOO ABRUPT for my comfort. Strongly Disagree Undecided Agree Strongly Disagree Agree [ ] [ 1 [ ] [ ] [ ] 7. The pace or speed of the pictures changed TOO RAPIDLY for my taste. Strongly Disagree Undecided Agree Strongly Disagree Agree [] [ ] [ ] ſ ] [ 1

8. The pictures <u>WERE TOO BUSY OR COMPLEX</u> to be fully understood.

Stro Disa	ongly agree		Dis	agı	ree		Ur	nde	cide	ed		Agı	ee			Stro Agro	ongly ee
ľ	]		[	• ·	)			[	]			[	]			[	]
9.	Some <u>CLOSE</u>	items ER).	shc	oulo	l ha	ve	been	ph	otog	graphed	in	BOI	DER	deta	il	( <u>UP</u>	
Stro Disa	ongly agree		Dis	agı	cee		Ur	nde	cide	ed		Agı	ee			Stro Agro	ongly ee
[	]		(	•	)			[	]			[	]			[	]
10.	This	news	stor	y v	vas	pre	sente	ed	<u>T00</u>	SLOWLY	to	abs	orb	the	con	tent	•
Stro Disa	ongly agree		Disa	ıgre	e		Und	lec	ided	1		Agı	ee			Stro	ngly e

r 1	r 1	r 1	r i	r 1
1 1				
• •	• •	• •	• •	

,

.

BELOW ARE 10 MULTIPLE CHOICE QUESTIONS TO SEE HOW MUCH YOU REMEMBER FROM THE PROGRAM. PLEASE CIRCLE THE CORRECT ANSWER:

- 1. Who was shown playing the piano?
  - a. the music teacher
    b. the music teacher <u>and</u> the student
    c. the student
    d. no one
- 2. What financial arrangement did the piano teacher and the student have?
  - a. He pays her \$5 for each lessonb. She gives free lessons to under-privileged youngstersc. They do things free for each otherd. She receives a fee from Social Services
- 3. How often did the piano student take music lessons?
  - a. twice a weekb. twice a monthc. once a weekd. once a month
- 4. What outside chore did the student say he was willing to do?
  - a. shovel snow
  - b. mow the lawn
  - c. paint fence
  - d. clean the garage
- 5. How did the student and teacher find out about one another?
  - a. through mutual acquaintances
  - b. through "Friends of the Family Project"
  - c. through newspaper advertisements
  - d. through the school music program
- 6. In what specific Calgary district did this program take place?

- a. Hawkwood
- b. Huntington Hillsc. Marlborough
- d. Rundle
- a. Kunate
- 7. A value of the project coordinator featured in the story was,
  - a. free enterprise
  - b. being one's brother's keeper
  - c. government should support the arts
  - d. give a little, take a little

- 8. The reporter mentioned other opportunities for bartering. Which other specific one did he mention?

  - a. "trading meals for chores"b. "baking and sewing for home repairs"c. "painting fences for accounting"d. "home repairs for meals"

9. According to this report the idea of bartering was tied to?

- a. dealings "among friends" b. dealings "among family"c. dealings "in small towns"d. dealings "in other cities"
- 10. What was the name of the TV reporter?
  - a. Gord Kelly b. Murray Dale c. Greg Paisley d. Tony Tighe