Research Proposal/Research Paper

Grading Criteria for Proposal

5 I. Title Page

II. Abstract (not required until final draft).

III. Introduction

20
- A. Describes at least 2 relevant studies in detail including:
  1. Purpose of each study.
  2. Method used (Subjects, apparatus, procedure).
  3. Results of each study.
  4. Importance of each study.
- B. Paragraph describing your hypothesis, procedure you'll use to test your hypothesis, and expected outcome

IV. Method

- A. Participants (Subjects)
  5
  1. Describe subject variables (number, gender, special characteristics).
  2. Describe the population from which the subjects will be selected (how will random sampling be accomplished).
- B. Experimental Design
  1. Describe the primary experimental design.
  5
  2. Describe the independent variable, dependent variable(s) and explain how they will be measured in the study.
  3. Describe the major control manipulations to be used.
- C. Materials (Apparatus)
  5
  1. List materials and describe appropriate model numbers, computer programs, dimensions, survey names.
- D. Procedure
  1. Clearly describe, in sequence, how the study will be conducted (a step-by-step description). Include any instructions to subjects (include any paper and pencil information sheet) and the debriefing.
  15

V. Proposed Results

10
- A. Describes the proposed data analysis (statistical tests to be used).
  2 ½
- B. Presents the variables that will be presented in the figure (appropriate for the scale of D.V. measurement).
  2 ½
- C. A blank version of the table that will be used to present the data.

VI. References

5
- A. Each reference mentioned must be cited here in APA style.

VII. Extras

5
- A. Overall APA style
- B. Articles included
- C. Informed Consent form
  10
  10

TITLE OF STUDY

NAME, DEPARTMENT AND TELEPHONE NUMBER OF INVESTIGATOR

You have been asked to participate in a research study which is exempt from review by a Human Subjects Review Committee. The purpose of the study, the terms of your participation, as well as any expected risks and benefits must be fully explained to you before you sign this form and give your consent to participate.

You should also know that:

Participation in research is entirely voluntary. You may refuse to participate or withdraw from participation at any time without jeopardy to future medical care, education or employment status or other entitlement.

The investigator may withdraw you from participation at his/her professional discretion.

If, during the course of this study, significant new information which has been developed during the study becomes available, which may relate to your willingness to continue to participate, this information will be provided to you by the investigator.

Any information derived from this research project which personally identifies you will not be voluntarily released or disclosed without your separate consent, except as specifically required by law.

If at any time you have questions regarding the research or your participation in it, you should contact the investigator or his/her assistants who must answer your questions.

If, at any time, you have comments or complaints relating to the conduct of this research or if you wish to discuss your rights as a research subject, you may contact Human Research Administration at

You should be given a copy of this consent form to keep.

* *

I consent to participate in this study.

SIGNATURE OF SUBJECT (Age 7 & older) DATE

SIGNATURE OF PARENT/GUARDIAN DATE

SIGNATURE OF INVESTIGATOR DATE

SIGNATURE OF WITNESS DATE

DEBRIEFING FORM

You have just participated in research on social interaction conducted by researchers within the Department of Psychology at Texas A&M University.

This research is designed to determine whether different "styles" of attachment to others influence the nature of spontaneous interaction that transpires between dating couples.

Past research has identified 3 primary attachment "styles". One style is characterized by a tendency to typically seek out a moderate amount of comfort from a romantic partner when one is experiencing stress or anxiety. A second style involves a tendency to seek out a minimal amount of comfort when one is under stress or anxiety. Finally, the third style entails a tendency to seek out a great amount of comfort when one is experiencing stress or anxiety. All 3 styles reflect normal adaptations to one's social environment.

In this study, we first had you indicate (on the self-report questionnaire survey) which style best characterizes you. We then videotaped the interaction that transpired between you and your partner as you waited for the "experimental" portion of the study to begin. Following this, we told one of you that you would be experiencing a stressful/anxiety-provoking event as part of the experimental portion of the study. We then videotaped your interaction during the 5 minute waiting period prior to this stressful event (which, of course, you never experienced). Finally, after the experimental informed you that a "scheduling problem" prohibited the study from continuing (which was a cover story used to conclude the study), we videotaped your interaction to see how the two of you behaved once the "stressor" was removed. We hypothesize that individuals who possess different attachment styles will have very different types of spontaneous interactions with their partners across the 3 interaction episodes.

To successfully study the spontaneous, natural, and uninhibited interaction that occurs in romantic relationships, we had to covertly videotape your spontaneous interactions. We did not warn you about this videotaping because previous research has shown that when you inform people that their behavior is being monitored, they alter it in very constrained and unnatural ways. In particular, their natural interaction tendencies are inhibited and distorted.

Since we are interested in naturalistic interaction, we could not inform you about this procedure beforehand. However, if for any reason you do not want your videotaped interaction to be evaluated by coders, we will be more than happy to erase the videotape. Moreover, you will not be penalized in any way for doing so.

To ensure confidentiality, each participant will be given anonymous identification numbers. Your data will be coded by 3 independent researchers who will not know you. After the coding is completed (within about 6 months), the videotapes will be erased. This procedure will guarantee that your name will never be associated with your interaction episodes.

If you have any additional questions about this research, please contact either Dr. Jeff Simpson or Dr. Steve Rholes at 845-7146.

I hereby grant permission to allow the videotape to be used only for research purposes, after which it will be destroyed.

_____

Signature

NOTE: This example was supplied by Jeff Simpson, Department of Psychology, Texas A&M University.

Sample Research Proposal

DIFFERNECES IN IDEA GENERATION BETWEEN GROUPS AND INDIVIDUALS

Idea Generation Differences Between Groups and Individuals

Eastern Michigan University

Idea Generation Differences Between Groups and Individuals

Experiments conducted through time demonstrate that the quantity and quality of the ideas generated by individuals in interacting groups is usually inferior to the ones generated by a single persons in relative isolation, not influenced by others (Culvner, 2003).

A very intricate research was compiled by Valaich, Dennis and Clark (1994) comparing idea generation by people connected through a computer network that allowed interaction for certain people and isolation for others. The individuals were asked to brainstorm about the impact of fictional public policy problems given to them. Four total experiments were conducted. The first three were comprised of 199 upper division business students, 276 upper division business students and 180 upper division business students respectively. The students were randomly assigned in either isolation or groups of three, nine, eighteen, four, eight and twelve participants. All the students were accommodated in the Group Meeting Room of the Arizona Center for Management of Information, a facility able to accommodate groups of up to twenty four participants. The subjects in groups were able to see the input of other, non-identified, members of the same group assigned to random computers in the room. This was made possible because of a local are network (LAN) that existed among the terminals. Individuals, not assigned to groups, could not see other participants input.

The fourth experiment was comprised of seventy two junior and senior business students randomly assigned into eight groups of nine participants. Four of the groups allowed members to type independently of each other. Four other groups were not allowed, by the system, to type while another member in the group was typing. The participants of all groups were able to see the input of other participants in their respective team.

In the first three experiments the groups were able to produce ideas of higher quantity and quality, as graded by graduate students and business professors, than the isolated individuals. In the fourth experiment the groups allowing its members to type independently of each other yielded ideas of higher quantity and quality, as graded by same group of graduate students and business professors, than the groups where only one person could type.

Another clever experiment was conducted by Culver (2003), pertaining to the quality of answers given by individuals versus groups in the area of occupational health and safety. The experiment was comprised by 294 manufacturing industry employs divided into groups ranging from four to nine participants. Six case studies were given to them, in the beginning individually and afterwards in a group, subsequent of two one hour sessions of occupational health and safety provided by Culvner and the University of Ballarat staff. After reading each case study the subjects were given approximately 15 minutes to read solutions, provided to them by the experimenter, and rank them in order from one to six. Upon completion of the task the individuals were grouped and asked to come into agreement regarding the solutions all of them had previously grouped. The ranking was graded by experts.

The mean score for an individuals was approximately 0.3 while for the groups approximately 0.7; showing considerably higher scores for the group rankings than individual ones.

Idea generation is a process widely used and increasingly important in today's world. Because the price of the human factor, an absolute need in idea generation, is prohibitively high it is exceedingly important to maximize efficiency and value.

I believe that an individual is able to produce the same amount, and quality, of ideas or more than groups given the knowledge of the area in question is equal.

Upon the completion of the study I believe to have sufficient data to prove that ideas produced by individuals are at least of the same quantity and quality than those produced by groups; given the knowledge is approximately equal.

Method

Participants

Forty female and male undergraduate students from an Eastern Michigan University (EMU) experimental psychology course and Wayne State University (WSU) marketing strategy course will be asked to participate in the experiment voluntarily; with extra credit of two percentage points, towards the course, awarded to the WSU students. The participant's age, race, primary language and educational background may vary considerably. The WSU students will be randomly assigned to groups of four, while the EMU students will conduct the experiment individually - in relative isolation.

Design

Subjects will be given a pamphlet comprised of three pages and asked to write as many ideas as possible in the first two pages of the question posed on the third page. The question will be made incredibly easy as to assure that all the participants would have little to no information asymmetry. The individuals will be placed relatively far from each other, enough distance so they can not see each others pamphlets, while groups will be placed in different rooms with relative noise absence from outside.

Individuals will not be allowed to communicate with anyone else during the experiment while group members could converse among each other without restraint. Each group will be only provided with exactly one pamphlet and only one group member can write in it.

Materials

Each individual, in the isolated setting, and each group, in the group setting, will be presented with a pamphlet comprised of three pages. The first page will have instructions on how to use the pamphlet and how the experiment will be conducted. The time limit, seven minutes, would also be included on the top page. The rest of the first two pages will include numbers where participants can write their responses while the third page will have the question subjects were supposed to generate ideas about.

A pencil or pen of their preference will be allowed to be used. The time will be measured with a Sony Erickson Z500a phone/chronometer and the results were computed using Statistical Package for Social Sciences (SPSS).

All the subjects will also be presented, and required to sign prior to the beginning of the experiment, with a consent form.

Procedure

The individuals will be assigned randomly in separate tables with considerable distance between each other. They will be presented with a consent form and described that the experiment is being conducted to compare idea generation among groups and individuals. After signing the consent form they will be presented with a pamphlet comprised of three pages. The first two pages will contain instructions on how to fill the pamphlet and the time they will have, seven minutes, and computer typed numbers in alternating lines; making sure there is sufficient amount of space for them to enter the ideas. They will be instructed orally by the experimenter to write as many ideas regarding the question "How do you think USA should help in abolishing starvation in poor countries" - which will be presented in the third page – without communicating with others. The participants will be instructed to open the third page as soon as the experimenter left the room; the time also would start in that moment. After exactly seven

minutes the experimenter will instruct the subjects to finish their sentences and close the pamphlets.

The groups will receive exactly the same pamphlet and instructions except communication possibilities among group members. They will be instructed to communicate with each other as they please and have only one person of their choice write in the booklet.

The subjects in groups will be placed in rooms with relatively no outside noise. After the seven minutes the member of the group writing will be instructed to finish the sentence and close the pamphlet.

All the participants will be allowed to use whatever pen or pencil they desired and extras will be provided by the experimenter in case one falters.

Results

Descriptive statistics will be run for both groups as shown in Table1.

A two tailed independent sample t-test with alpha level of 0.05 between the two variables regarding with quantity of responses, will be conducted. A two tailed independent sample t-test with alpha level of 0.5 will also be conducted among the two variables regarding the quality of responses. The two tests are represented on Tables 2.

Discussion

It is quite possible that despite the small sample I could have very promising results, results showing that individuals do indeed produce the same quantity and quality of ideas than groups. But if not there could be plenty of reasons. Many compromises will unfortunately be made because of the available resource. Nevertheless lets be optimists.

DIFFERNECES IN IDEA GENERATION BETWEEN GROUPS AND INDIVIDUALS

This does not mean that the hypothesis created in the beginning of the experiment can not be true; by and large because numerous confounding variables, and the minimal number of participants. It is quite possible that the small number of groups, only eight, can make detection quite impossible or hinder results altogether.

Confounding variables not removed, such as the education differences among subjects – the groups were comprised of graduate level or senior business students while individuals were junior psychology students - or time of day the experiment was conducted – the individuals completed the task late in the evening while group participants in the early morning hours – could have impacted the results in undetectable ways.

Albeit the t-tests show no significant statistical difference the means and individual scores show promise. At this stage I would suggest the experiment was rerun with considerably more participants, approximately 35 individuals and groups, to see whether the results change. Also the ability to maintain confounding variables to a minimum, if not eliminate them completely seems to be vital.

It would also be interesting if the experiment was redirected to a specific field, such as business or health, instead of generalizing the topic to its maximum.

58

How was material objectively scored? What were the criteria?

Flaws / Confounds in your procedure?

Future Directions

9/15

References

Culvenor, J. (2003). Comparison of Team individual Judgment of Solution to Safety Problems. *Saftey Science*, *41*, 543-556.

Valaich, J., Dennis, A., & Connolly, T. (1994). Idea Generation in Computer Based Groups: A new ending to an old story. *Journal of Managment*, *57*, 448-467.

DIFFERNECES IN IDEA GENERATION BETWEEN GROUPS AND INDIVIDUALS

Appendix

59 8/10 Appendix } Scenario for generating ideas — sheet to write ideas a

Techniques in Idea Generation

You have been asked to participate in a research study which is exempt from review by a Human Subject Review Committee. The purpose of this study, the terms of your participation as well as any expected risks and benefits must be fully explained to you before you sign this form and give consent to participate.

You should also know that:

Participation in research is entirely voluntary. You may refuse to participate or withdraw from participation at any time without jeopardy to future medical care, education or employment status or other entitlement.

The investigator may withdraw you from participation at his/her discretion.

If during the study significant new information which has been developed during the study becomes available which may relate to willingness to participate this information will be provided to you by the investigator.

Any information derived from this research which personally identifies you will not be voluntarily released or disclosed without your separate consent expect as specifically required by law.

If at any time you have questions regarding the participation in it contact the investigator.

If at any time you have comments or complaints relating to conduct of research or if you wish to discuss the rights as a subject contact human Research Administration at 714-856-6068.

The experiment:

The experiment is about idea generation. Upon being give a certain question the participant(s) generates as many ideas as possible in a set time interval.

You should be given a copy of this consent to keep.

I consent to participate in this study.

_____

Signature of Subject Date

Please give as many solutions as possible to the problem that will be presented to you.
The time allowed is 7 minutes.

1.

2.

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18.

DIFFERNECES IN IDEA GENERATION BETWEEN GROUPS AND INDIVIDUALS

Tables

Table1

	Quantity	Quality
Mean for Individuals	10.75	99.50
Standart Deviation for Individuals	3.11	34.34
Mean for Groups	11.25	85.00
Standart Deviation for Groups	5.26	37.20

- Table1 shows the means and standard deviations of all the groups

Table2

	alpha 0.05
t-test Value for Quantity	-0.23
Critical t-test Value for Quantity	2.2
t-test Value for Quality	0.81
Critical t-test Value for Quality	2.2

Where is the rest of the information

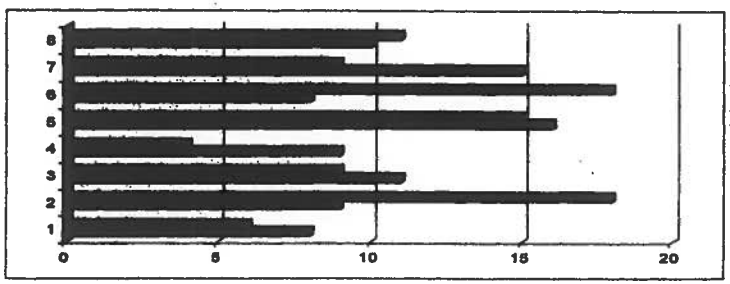
DIFFERNECES IN IDEA GENERATION BETWEEN GROUPS AND INDIVIDUALS

Figure Caption

1. Graph number one represents the quantitative answers by both individuals and groups.
2. Graph number two represents the qualitative answers by both individuals and groups.

DIFFERNECES IN IDEA GENERATION BETWEEN GROUPS AND INDIVIDUALS

Graph1



Red – Individuals
Blue - Groups

Grading Criteria For APA Style Experimental Report

I. Title Page

A. Title states the independent and dependent variable
B. Title page includes title, author's name, author's affiliation, running head, header, and page number.

II. Abstract (not more than 100 words)

A. States the critical elements of the experiment:

1. States the experimental hypothesis
2. Identifies the independent variable and the dependent variable.
3. Describes critical parts of the procedure
4. Draws a conclusion

III. Introduction

A. Describes at least 2 relevant studies in detail:

1. Purpose of study
2. Method used in study
3. Results of the study
4. Importance of the study

B. States appropriate background information needed to understand the purpose and design of the study.
C. States the purpose of the experiment (hypothesis)
D. Makes a prediction about the outcome of the study.

IV. Method

A. Subjects

1. Describes setting from which subjects selected.
2. Describes how subjects were randomly selected and randomly assigned to conditions.
3. Describes critical characteristics of subjects.

B. Design

1. Presents the major experimental design.
2. Presents and describes the independent and dependent variable(s) and explains how they were combined in the design of the study.
3. Describes the major control manipulation(s).

C. Apparatus

1. Lists materials and describes: 1. appropriate model numbers; 2. type of computer; 3. computer program; 4. dimensions of apparatus; 5. concentrations; 6. name and reference for paper and pencil measures, etc.

D. Procedure

1. Describes in clear, sequential statements how the study was conducted (step-by-step): Include any instructions and debriefing information.

V. Results

1. Describes the statistical analyses which were used.
2. States main findings verbally so that the reader can understand the overall results without looking at the figures.
3. Points out important features of the graphs.
4. Refers to all data presented in the graphs and tables.
5. Presents all data mentioned in the text.
6. Refers to figures/tables correctly

VI. Discussion

A. Presents a brief summary of the results.
B. Interprets the change in dependent variable values to their meaning for the study.
C. Results related to previous studies cited in the intro.
D. Discusses whether the hypothesis was confirmed or not.
E. Points out relevant flaws in the study.
F. Suggests directions for future research.

VII. References

A. Each reference written in correct APA format.
B. All references are listed in alphabetical order.
C. All references in the text are listed.

VIII. Appendixes

A. Each separate appendix begins on separate page.
B. All written materials used in the experiment are included.

IX. Tables

A. Tables are self explanatory.
B. Appropriate data is presented in table (doesn't simply repeat data shown in the figures.

X. Figure Captions

A. Presents a figure caption for each figure.

XI. Figures

A. Figures are neat, appropriate for scale of measurement, and centered on the page.
B. Figures are labeled correctly (both ordinate and abscissa are labeled).
C. Each figure is drawn to scale.
D. Legend for each figure.

Class Presentation of 301 Experiment

I. Organization of Presentation

A. Material presented in logical form.

1. Outline of presentation described & adhered to.

B. Presentation format:

1. Introduction & Review of Literature briefly presented.
2. Method .(Subjects, apparatus, & procedure. generally described--not overly detailed.
3. Discussion briefly presented.
4. Material presented within ten-minute time limit.

C. Visual Aids

1. Use of some form of a visual aid (overhead transparancy, slides, charts, etc.)

II. Style of Presentation

A. Refers only briefly to notes but does not read from the paper.

B. Established eye contact.

C. Voice loudness appropriate

D. Speaking rate & tone appropriate (not overly fast or slow)

E. Speaker has some movement (not excessive movement yet not frozen in front of class).

F. Minimal occurrence of verbal ticks (e.g., um, ah, well etc.)

G. Handles questions well.

Sample APA-Style Research Report

Effects of Age on Detection of Emotional Information

Christina M. Leclerc and Elizabeth A. Kensinger

Boston College

Author Note

This research was supported by National Science Foundation Grant BCS 0542694 awarded to Elizabeth A. Kensinger.

Correspondence concerning this article should be addressed to Christina M. Leclerc, Department of Psychology, Boston College, McGuinn Hall, Room 512, 140 Commonwealth Avenue, Chestnut Hill, MA 02467. Email: christina.leclerc.1@bc.edu

Abstract

Age differences were examined in affective processing, in the context of a visual search task. Young and older adults were faster to detect high arousal images compared with low arousal and neutral items. Younger adults were faster to detect positive high arousal targets compared with other categories. In contrast, older adults exhibited an overall detection advantage for emotional images compared with neutral images. Together, these findings suggest that older adults do not display valence-based effects on affective processing at relatively automatic stages.

Keywords: aging, attention, information processing, emotion, visual search

Effects of Age on Detection of Emotional Information

Frequently, people encounter situations in their environment in which it is impossible to attend to all available stimuli. It is therefore of great importance for one's attentional processes to select only the most salient information in the environment to which one should attend. Previous research has suggested that emotional information is privy to attentional selection in young adults (e.g., Anderson, 2005; Calvo & Lang, 2004; Carretie, Hinojosa, Marin-Loeches, Mecado & Tapia, 2004; Nummenmaa, Hyona, & Calvo, 2006), an obvious service to evolutionary drives to approach rewarding situations and to avoid threat and danger (Davis & Whalen, 2001; Dolan & Vuilleumier, 2003; Lang, Bradley, & Cuthbert, 1997; LeDoux, 1995).

For example, Ohman, Flykt, and Esteves (2001) presented participants with 3 × 3 visual arrays with images representing four categories (snakes, spiders, flowers, mushrooms). In half the arrays, all nine images were from the same category, whereas in the remaining half of the arrays, eight images were from one category and one image was from a different category (e.g., 8 flowers and 1 snake). Participants were asked to indicate whether the matrix included a discrepant stimulus. Results indicated that fear-relevant images were more quickly detected than fear-irrelevant items, and larger search facilitation effects were observed for participants who were fearful of the stimuli. A similar pattern of results has been observed when examining the attention-grabbing nature of negative facial expressions, with threatening faces (including those not attended to) identified more quickly than positive or neutral faces (Eastwood, Smilek, & Merikle, 2001; Hansen & Hansen, 1988). The enhanced detection of emotional information is not limited to threatening stimuli; there is evidence that any high-arousing stimulus can be detected rapidly, regardless of whether it is positively or negatively valenced (Anderson, 2005;

Comment [e4]: Writing the introduction, 2.05

Comment [e5]: Original citation within the same parentheses, 0.10

Comment [e6]: Spacing the correct way, 3.10

Comment [e7]: Numbers that represent statistical or mathematical functions, 4.31

Comment [e8]: Numbers expressed in words, 4.32

Comment [e9]: Use of hyphenation for compound words, 4.13; Table 4.1

Calvo & Lang, 2004; Carretie et al., 2004; Juth, Lundqvist, Karlsson, & Ohman, 2005; Nummenmaa et al., 2006).

From this research, it seems clear that younger adults show detection benefits for arousing information in the environment. It is less clear whether these effects are preserved across the adult life span. The focus of the current research is on determining the extent to which aging influences the early, relatively automatic detection of emotional information.

Regions of the brain thought to be important for emotional detection remain relatively intact with aging (reviewed by Chow & Cummings, 2000). Thus, it is plausible that the detection of emotional information remains relatively stable as adults age. However, despite the preservation of emotion-processing regions with age (or perhaps because of the contrast between the preservation of these regions and age-related declines in cognitive-processing regions; Good et al., 2001; Hedden & Gabrieli, 2004; Ohnishi, Matsuda, Tabira, Asada, & Uno, 2001; Raz, 2000; West, 1996), recent behavioral research has revealed changes that occur with aging in the regulation and processing of emotion. According to the socioemotional selectivity theory (Carstensen, 1992), with aging, time is perceived as increasingly limited, and as a result, emotion regulation becomes a primary goal (Carstensen, Isaacowitz, & Charles, 1999). According to socioemotional selectivity theory, age is associated with an increased motivation to derive emotional meaning from life and a simultaneous decreasing motivation to expand one's knowledge base. As a consequence of these motivational shifts, emotional aspects of the environment become more salient and the frequency with which emotion regulation goals are activated increases (Carstensen, Fung & Charles, 2003), causing a shift in focus to emotional aspects of information. Thus, older adults may actually show a greater detection of emotional information in their environment than do young adults.

Comment [e10]: Continuity in presentation of ideas, 3.05

Comment [e11]: Phrase not used by six or more authors, 4.12

Comment [e12]: Use of hyphenation for compound words, 4.13

To maintain positive affect in the face of negative age-related change (e.g., limited time remaining, physical and cognitive decline), older adults may adopt new cognitive strategies. One such strategy, discussed recently, is the positivity effect (Carstensen & Mikels, 2005), in which older adults spend proportionately more time processing positive emotional material and less time processing negative emotional material. Studies examining the influence of emotion on memory (Charles, Mather, & Carstensen, 2003; Kennedy, Mather, & Carstensen, 2004) have found that compared with younger adults, older adults recall proportionally more positive information and proportionally less negative information. Similar results have been found when examining eye-tracking patterns: Older adults looked at positive images longer than younger adults did, even when no age differences were observed in looking time for negative stimuli (Isaacowitz, Wadlinger, Goren, & Wilson, 2006). However, this positivity effect has not gone uncontested; some researchers have found evidence inconsistent with the positivity effect (e.g., Grühn, Smith, & Baltes, 2005; Kensinger, Brierley, Medford, Growdon, & Corkin, 2002).

Based on this previously discussed research, three competing hypotheses exist to explain age differences in emotional processing associated with the normal aging process. First, emotional information may remain important throughout the life span, leading to similarly facilitated detection of emotional information in younger and older adults. Second, with aging, emotional information may take on additional importance, resulting in older adults' enhanced detection of emotional information in their environment. Third, older adults may focus principally on positive emotional information and may show facilitated detection of positive, but not negative, emotional information.

The primary goal in the present experiment was to adjudicate among these alternatives. To do so, we employed a visual search paradigm to assess young and older adults' abilities to

rapidly detect emotional information. We hypothesized that on the whole, older adults would be slower to detect information than young adults would be (consistent with Hahn, Carlson, Singer, & Gronlund, 2006; Mather & Knight, 2006); the critical question was whether the two age groups would show similar or divergent facilitation effects with regard to the effects of emotion on item detection. On the basis of the existing literature, the first two previously discussed hypotheses seemed to be more plausible than the third alternative. This is because there is reason to think that the positivity effect may be operating only at later stages of processing (e.g., strategic, elaborative, and emotion regulation processes) rather than at the earlier stages of processing involved in the rapid detection of information (see Mather & Knight, 2005, for discussion). Thus, the first two hypotheses, that emotional information maintains its importance across the life span or that emotional information in general takes on greater importance with age, seemed particularly applicable to early stages of emotional processing.

Indeed, a couple of prior studies have provided evidence for intact early processing of emotional facial expressions with aging. Mather and Knight (2006) examined young and older adults' abilities to detect happy, sad, angry, or neutral faces presented in a complex visual array. Mather and Knight found that like younger adults, older adults detected threatening faces more quickly than they detected other types of emotional stimuli. Similarly, Hahn et al. (2006) also found no age differences in efficiency of search time when angry faces were presented in an array of neutral faces, compared with happy faces in neutral face displays. When angry faces, compared with positive and neutral faces, served as nontarget distractors in the visual search arrays, however, older adults were more efficient in searching, compared with younger adults, suggesting that older adults were better able to inhibit angry facial expressions. Although these studies included both positive and negative stimuli, it is important to note that the positive and

negative stimuli were not of equivalent arousal levels (fearful faces typically are more arousing than happy faces; Hansen & Hansen, 1988). Given that arousal is thought to be a key factor in modulating the attentional focus effect (Hansen & Hansen, 1988; Pratto & John, 1991; Reimann & McNally, 1995), to more clearly understand emotional processing in the context of aging, it is necessary to include both positive and negative emotional items with equal levels of arousal.

In the current research, therefore, we compared young and older adults' detection of four categories of emotional information (positive high arousal, positive low arousal, negative high arousal, and negative low arousal) with their detection of neutral information. The positive and negative stimuli were carefully matched on arousal level, and the categories of high and low arousal were closely matched on valence to assure that the factors of valence (positive, negative) and arousal (high, low) could be investigated independently of one another. Participants were presented with a visual search task including images from these different categories (e.g., snakes, cars, teapots). For half of the multi-image arrays, all of the images were of the same item, and for the remaining half of the arrays, a single target image of a different type from the remaining items was included. Participants were asked to decide whether a different item was included in the array, and their reaction times were recorded for each decision. Of primary interest were differences in response times (RTs) based on the valence and arousal levels of the target categories. We reasoned that if young and older adults were equally focused on emotional information, then we would expect similar degrees of facilitation in the detection of emotional stimuli for the two age groups. By contrast, if older adults were more affectively focused than were younger adults, older adults should show either faster detection speeds for all of the emotional items (relative to the neutral items) than shown by young adults or greater facilitation

Comment [a21]: Prefixed words that require hyphens, Table 4.3

Comment [a22]: Using abbreviations 4.22, Explanation of abbreviations 4.23, Abbreviations used often in APA journals 4.25, Plurals of abbreviations 4.29

for the arousing items than shown by the young adults (resulting in an interaction between age and arousal).

Method

Participants

Younger adults (14 women, 10 men, M_{age} = 19.5 years, age range: 18–22 years) were recruited with flyers posted on the Boston College campus. Older adults (15 women, 9 men, M_{age} = 76.1 years, age range: 68–84 years) were recruited through the Harvard Cooperative on Aging (see Table 1 for demographics and test scores).[1] Participants were compensated $10 per hour for their participation. There were 30 additional participants, recruited in the same way as described above, who provided pilot rating values: 5 young and 5 old participants for the assignment of items within individual categories (i.e., images depicting cats), and 10 young and 10 old participants for the assignment of images within valence and arousal categories. All participants were asked to bring corrective eyewear if needed, resulting in normal or corrected to normal vision for all participants.

Materials and Procedure

The visual search task was adapted from Ohman et al. (2001). There were 10 different types of items (2 each of five Valence × Arousal categories: positive high arousal, positive low arousal, neutral, negative low arousal, negative high arousal), each containing nine individual exemplars that were used to construct 3 × 3 stimulus matrices. A total of 90 images were used, each appearing as a target and as a member of a distracting array. A total of 360 matrices were presented to each participant; half contained a target item (i.e., 8 items of one type and 1 target item of another type) and half did not (i.e., all 9 images of the same type). Within the 180 nontarget trials, the location of each item rotated twice through the nine locations in a given

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Comment [a24]: Organizing a manuscript with levels of heading, 3.03

Comment [a25]: [illegible]

Comment [a26]: Using numerals to express numbers representing age, 4.31

Comment [a27]: Numbering and discussing tables in text, 5.05

Comment [a28]: Participant (subject) characteristics, Method, 2.06

matrix. Within the 180 target trials, each of the five emotion categories (e.g., positive high arousal, neutral, etc.) was represented in 36 trials. Further, within each of the 36 trials for each emotion category, 9 trials were created for each of the combinations with the remaining four other emotion categories (e.g., 9 trials with 8 positive high arousal items and 1 neutral item). Location of the target was randomly varied such that no target within an emotion category was presented in the same location in arrays of more than one other emotion category (i.e., a negative high arousal target appeared in a different location when presented with positive high arousal array images than when presented with neutral array images).

The items within each category of grayscale images shared the same verbal label (e.g., mushroom, snake), and the items were selected from online databases and photo clipart packages. Each image depicted a photo of the actual object. Ten pilot participants were asked to write down the name corresponding to each object; any object that did not consistently generate the intended response was eliminated from the set. For the remaining images, an additional 20 pilot participants rated the emotional valence and arousal of the objects and assessed the degree of visual similarity among objects within a set (i.e., how similar the mushrooms were to one another) and between objects across sets (i.e., how similar the mushrooms were to the snakes).

Valence and arousal ratings. Valence and arousal were judged on 7-point scales (1 = *negative valence* or *low arousal* and 7 = *positive valence* or *high arousal*). Negative objects received mean valence ratings of 2.5 or lower, neutral objects received mean valence ratings of 3.5 to 4.5, and positive objects received mean valence ratings of 5.5 or higher. High arousal objects received mean arousal ratings greater than 5, and low arousal objects (including all neutral stimuli) received mean arousal ratings of less than 4. We selected categories for which both young and older adults agreed on the valence and arousal classifications, and stimuli were

selected such that the arousal difference between positive low arousal and positive high arousal was equal to the difference between negative low arousal and negative high arousal.

Similarity ratings. Each item was rated for within-category and between-categories similarity. For within-category similarity, participants were shown a set of exemplars (e.g., a set of mushrooms) and were asked to rate how similar each mushroom was to the rest of the mushrooms, on a 1 (*entirely dissimilar*) to 7 (*nearly identical*) scale. Participants made these ratings on the basis of overall similarity and on the basis of the specific visual dimensions in which the objects could differ (size, shape, orientation). Participants also rated how similar objects of one category were to objects of another category (e.g., how similar the mushrooms were to the snakes). Items were selected to assure that the categories were equated on within-category and between-categories similarity of specific visual dimensions as well as for the overall similarity of the object categories (*ps* > .20). For example, we selected particular mushrooms and particular cats so that the mushrooms were as similar to one another as were the cats (i.e., within-group similarity was held constant across the categories). Our object selection also assured that the categories differed from one another to a similar degree (e.g., that the mushrooms were as similar to the snakes as the cats were similar to the snakes).

Procedure

Each trial began with a white fixation cross presented on a black screen for 1,000 ms; the matrix was then presented, and it remained on the screen until a participant response was recorded. Participants were instructed to respond as quickly as possible with a button marked *yes* if there was a target present, or a button marked *no* if no target was present. Response latencies and accuracy for each trial were automatically recorded with E-Prime (Version 1.2) experimental

software. Before beginning the actual task, participants performed 20 practice trials to assure compliance with the task instructions.

Results

Analyses focus on participants' RTs to the 120 trials in which a target was present and was from a different emotional category from the distractor (e.g., RTs were not included for arrays containing eight images of a cat and one image of a butterfly because cats and butterflies are both positive low arousal items). RTs were analyzed for 24 trials of each target emotion category. RTs for error trials were excluded (fewer than 5% of all responses) as were RTs that were ±3 *SD* from each participant's mean (approximately 1.5% of responses). Median RTs were then calculated for each of the five emotional target categories, collapsing across array type (see Table 2 for raw RT values for each of the two age groups). This allowed us to examine, for example, whether participants were faster to detect images of snakes than images of mushrooms, regardless of the type of array in which they were presented. Because our main interest was in examining the effects of valence and arousal on participants' target detection times, we created scores for each emotional target category that controlled for the participant's RTs to detect neutral targets (e.g., subtracting the RT to detect neutral targets from the RT to detect positive high arousal targets). These difference scores were then examined with a 2 × 2 × 2 (Age [young, older] × Valence [positive, negative] × Arousal [high, low]) analysis of variance (ANOVA). This ANOVA revealed only a significant main effect of arousal, $F(1, 46) = 8.41$, $p = .006$, $\eta_p^2 = .16$, with larger differences between neutral and high arousal images ($M = 137$) than between neutral and low arousal images ($M = 93$; i.e., high arousal items processed more quickly across both age groups compared with low arousal items; see Figure 1). There was no significant main effect for valence, nor was there an interaction between valence and arousal. It is critical that the analysis

revealed only a main effect of age but no interactions with age. Thus, the arousal-mediated effects on detection time appeared stable in young and older adults.

The results described above suggested that there was no influence of age on the influences of emotion. To further test the validity of this hypothesis, we submitted the RTs to the five categories of targets to a 2 × 5 (Age [young, old] × Target Category [positive high arousal, positive low arousal, neutral, negative low arousal, negative high arousal]) repeated measures ANOVA.[2] Both the age group, $F(1, 46) = 540.32$, $p < .001$, $\eta_p^2 = .92$, and the target category, $F(4, 184) = 8.98$, $p < .001$, $\eta_p^2 = .16$, main effects were significant, as well as the Age Group × Target Category interaction, $F(4, 184) = 3.59$, $p = .008$, $\eta_p^2 = .07$. This interaction appeared to reflect the fact that for the younger adults, positive high arousal targets were detected faster than targets from all other categories, $ts(23) < -1.90$, $p < .001$, with no other target categories differing significantly from one another (although there were trends for negative high arousal and negative low arousal targets to be detected more rapidly than neutral targets ($p < .12$). For older adults, all emotional categories of targets were detected more rapidly than were neutral targets, $ts(23) > 2.56$, $p < .017$, and RTs to the different emotion categories of targets did not differ significantly from one another. Thus, these results provided some evidence that older adults may show a broader advantage for detection of any type of emotional information, whereas young adults' benefit may be more narrowly restricted to only certain categories of emotional information.

Discussion

As outlined previously, there were three plausible alternatives for young and older adults' performance on the visual search task: The two age groups could show a similar pattern of enhanced detection of emotional information, older adults could show a greater advantage for

emotional detection than young adults, or older adults could show a greater facilitation than young adults only for the detection of positive information The results lent some support to the first two alternatives, but no evidence was found to support the third alternative.

In line with the first alternative, no effects of age were found when the influence of valence and arousal on target detection times was examined; both age groups showed only an arousal effect. This result is consistent with prior studies that indicated that arousing information can be detected rapidly and automatically by young adults (Anderson, Christoff, Panitz, De Rosa, & Gabrieli, 2003; Ohman & Mineka, 2001) and that older adults, like younger adults, continue to display a threat detection advantage when searching for negative facial targets in arrays of positive and neutral distractors (Hahn et al., 2006; Mather & Knight, 2006). Given the relative preservation of automatic processing with aging (Fleischman, Wilson, Gabrieli, Bienias, & Bennett, 2004; Jennings & Jacoby, 1993), it makes sense that older adults would remain able to take advantage of these automatic alerting systems for detecting high arousal information.

However, despite the similarity in arousal-mediated effects on detection between the two age groups, the present study did provide some evidence for age-related change (specifically, age-related enhancement) in the detection of emotional information. When examining RTs for the five categories of emotional targets, younger adults were more efficient in detecting positive high arousal images (as presented in Table 2), whereas older adults displayed an overall advantage for detecting all emotional images compared with neutral images. This pattern suggests a broader influence of emotion on older adults' detection of stimuli, providing support for the hypothesis that as individuals age, emotional information becomes more salient.

It is interesting that this second set of findings is clearly inconsistent with the hypothesis that the positivity effect in older adults operates at relatively automatic stages of information

processing, given that no effects of valence were observed in older adults' detection speed. In the present study, older adults were equally fast to detect positive and negative information, consistent with prior research that indicated that older adults often attend equally to positive and negative stimuli (Rosler et al., 2005). Although the pattern of results for the young adults has differed across studies—in the present study and in some past research, young adults have shown facilitated detection of positive information (e.g., Anderson, 2005; Calvo & Lang, 2004; Carretie et al., 2004; Juth et al., 2005; Nummenmaa et al., 2006), whereas in other studies, young adults have shown an advantage for negative information (e.g., Armony & Dolan, 2002; Hansen & Hansen, 1988; Mogg, Bradley, de Bono, & Painter, 1997; Pratto & John, 1991; Reimann & McNally, 1995; Williams, Mathews, & MacLeod, 1996)—what is important to note is that the older adults detected both positive and negative stimuli at equal rates. This equivalent detection of positive and negative information provides evidence that older adults display an advantage for the detection of emotional information that is not valence-specific.

Thus, although younger and older adults exhibited somewhat divergent patterns of emotional detection on a task reliant on early, relatively automatic stages of processing, we found no evidence of an age-related positivity effect. The lack of a positivity focus in the older adults is in keeping with the proposal (e.g., Mather & Knight, 2006) that the positivity effect does not arise through automatic attentional influences. Rather, when this effect is observed in older adults, it is likely due to age-related changes in emotion regulation goals that operate at later stages of processing (i.e., during consciously controlled processing), once information has been attended to and once the emotional nature of the stimulus has been discerned.

Although we cannot conclusively say that the current task relies strictly on automatic processes, there are two lines of evidence suggesting that the construct examined in the current

research examines relatively automatic processing. First, in their previous work, Ohman et al. (2001) compared RTs with both 2 × 2 and 3 × 3 arrays. No significant RT differences based on the number of images presented in the arrays were found. Second, in both Ohman et al.'s (2001) study and the present study, analyses were performed to examine the influence of target location on RT. Across both studies, and across both age groups in the current work, emotional targets were detected more quickly than were neutral targets, regardless of their location. Together, these findings suggest that task performance is dependent on relatively automatic detection processes rather than on controlled search processes.

Although further work is required to gain a more complete understanding of the age-related changes in the early processing of emotional information, our findings indicate that young and older adults are similar in their early detection of emotional images.). The current study provides further evidence that mechanisms associated with relatively automatic processing of emotional images are well maintained throughout the latter portion of the life span (Fleischman et al., 2004; Jennings & Jacoby, 1993; Leclerc & Hess, 2005It is critical that, although there is evidence for a positive focus in older adults' controlled processing of emotional information (e.g., Carstensen & Mikels, 2005; Charles et al., 2003; Mather & Knight, 2005), the present results suggest that the tendency to focus on the positive does not always arise when tasks require relatively automatic and rapid detection of information in the environment.

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Footnotes

[1] Analyses of covariance were conducted with these covariates, with no resulting influences of these variables on the pattern or magnitude of the results.

[2] These data were also analyzed with a 2 × 5 ANOVA to examine the effect of target category when presented only in arrays containing neutral images, with the results remaining qualitatively the same. More broadly, the effects of emotion on target detection were not qualitatively impacted by the distractor category.

Table 1

Participant Characteristics

	Young group		Older group			
Measure	*M*	*SD*	*M*	*SD*	*F* (1, 46)	*p*
Years of education	13.92	1.28	16.33	2.43	18.62	<.001
Beck Anxiety Inventory	9.39	5.34	6.25	6.06	3.54	.066
BADS–DEX	20.79	7.58	13.38	8.29	10.46	.002
STAI–State	45.79	4.44	47.08	3.48	1.07	.306
STAI–Trait	45.64	4.50	45.58	3.15	0.02	.963
Digit Symbol Substitution	49.62	7.18	31.58	6.56	77.52	<.001
Generative naming	46.95	9.70	47.17	12.98	.004	.951
Vocabulary	33.00	3.52	35.25	3.70	4.33	.043
Digit Span–Backward	8.81	2.09	8.25	2.15	0.78	.383
Arithmetic	16.14	2.75	14.96	3.11	1.84	.182
Mental Control	32.32	3.82	23.75	5.13	40.60	<.001
Self-Ordered Pointing	1.73	2.53	9.25	9.40	13.18	.001
WCST perseverative errors	0.36	0.66	1.83	3.23	4.39	.042

Note. The Beck Anxiety Inventory is from Beck et al. (1988); the Behavioral Assessment of the Dysexecutive Syndrome—Dysexecutive Questionnaire (BADS-DEX) questionnaire is from Wilson et al. (1996); the State–Trait Inventory (STAI) measures are from Spielberger et al. (1970); and the Digit Symbol Substitution, Digit Span Backward, and Arithmetic Wechsler Adult Intelligence and Memory Scale–III measures are from Wechsler (1997). Generative naming scores represent the total number of words produced in 60 s each for letter *F*, *A*, and *S*. the Vocabulary measure is from Shipley (1986); the Mental Control measure is from Wechsler (1987); the Self-Ordered Pointing measure was adapted from Petrides and Milner (1982); and the Wisconsin Card Sorting Task (WCST) measure is from Nelson (1976). All values represent raw, nonstandardized scores.

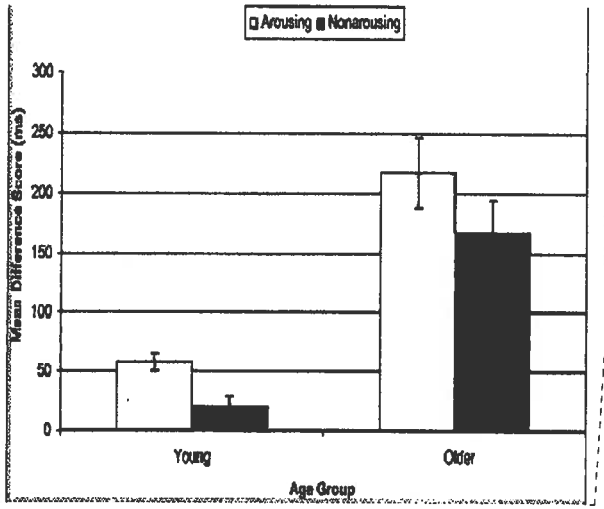
Table 2

Raw Response Time (RT) Scores for Young and Older Adults

Category	Young group	Older group
Positive high arousal	825	1,580
Positive low arousal	899	1,636
Neutral	912	1,797
Negative high arousal	885	1,578
Negative low arousal	896	1,625

Note. Values represent median response times, collapsing across array type and excluding arrays of the same category as targets (i.e., positive high arousal represents the median RT to respond to positive high arousal targets, collapsing across positive low arousal, neutral, negative high arousal, and negative low arousal array categories). The median response time values were recorded in milliseconds.

Figure 1. Mean difference values (ms) representing detection speed for each target category subtracted from the mean detection speed for neutral targets. No age differences were found in the arousal-mediated effects on detection speed. Standard errors are represented in the figure by the error bars attached to each column.



Direct Observation of Behavior

Direct Observation of Behavior

Science, above all else, is based on observation. This we assume as fundamental. Basic, applied, and clinical scientists agree on this. there are, however, many different ways in which scientists carry out observations. These ways provide the basic subject matter for areas such as this course, that is, the methodological aspect of given scientific disciplines.

Psychology is the science of behavior. Psychologists more or less agree on this (equivocation that exists is best understood by study of the scientific evolution of psychology). Now behavior comes in many different forms; an obvious "form" that will be the focus of this lab is the doings of an individual whose behavior is central in her being diagnosed as self-injurious and mentally retarded.

Basic, applied, and clinical behavioral scientists use several different techniques to observe their subject matter. These techniques include indirect methods such as retrospective studies and psychological tests, instrumentation that makes use of automatic recording devices such as movement detectors connected to counters, and direct observation using human observers. In this lab, you will have an opportunity to experience the latter method.

Actually, although it might appear that direct observation of behavior should be a much used fundamental method in behavioral science, only at present are psychologists beginning to use this methodology to any significant extent. Ethologists (biologists who specialize in behavior) have used direct observation to a much greater degree than have psychologists; thus, we often turn to ethologists for assistance.

To help you understand that the subject matter of this course is applicable to the full range of psychology (not only the laboratory), we will use direct observation (via a videotaped recording) to collect data on the behavior of an actual clinical client. In fact, a clinical psychologist should use an expanded version of the methodology we will use as a crucial aspect in assessment/diagnosis of the case.

Given the problem situation that the videotaped session reveals, the purpose of our methodology will be to obtain some data representative of the type of data that would be important in our understanding of the case.

Method

Bordens and Abbott discuss observational research and the subtype known as naturalistic observation on pp. 143-154. This lab will be an example of naturalistic observation (you will observe behavior and will make no manipulations). Videotape technology has made direct observation much more feasible than it used to be. We will use this technology.

The basic methodology of naturalistic and direct observation typically involves several steps. These are presented in the following:

A. Behaviors are selected for observation and operationally defined. This set of behaviors to be observed have been selected and are presented at the bottom of the following page.

B. Observers are trained. We can only give you an approximation of adequate training, but, given the nature of the events we have selected, you should be able to do a reasonable job.

C. The observers are checked/calibrated. This involves obtaining a quantitative estimate of interobserver agreement (interobserver reliability). In this lab, we will accomplish this by comparing your data with that of an expert observer through the use of a correlation coefficient. the frequency you obtain for each code will be correlated with that obtained by the expert.

   1. What you need to do:

      a. In class, view and score the videotape of the client engaging in self-injurious behavior.

      b. Total up your frequencies for each category. Also, record the frequencies observed by the expert (will be provided in class).

      c. In Minitab, enter your frequencies as one column (X) and the experts as a second column (Y). Use the CORR command to obtain the correlation coefficient (r). [Note: If you have forgotten how to access MINITAB and enter data, return to the MINITAB manual].

      d. Turn in a permanent copy (hardcopy) at the beginning of the next laboratory period. Include at the bottom of the copy your interpretation of the meaning of the correlation coefficient (i.e., do you and the expert strongly agree on what you observed?)

NAME_____

DIRECT OBSERVATION OF BEHAVIOR RECORDING SHEET

BEHAVIOR	FREQUENCY
1. HEAD BANG	
2. HEAD BANG AND OTHER APPROACHES	
3. HAND HIT TO FACE	
4. DROPS TOWARD FLOOR	
5. LOCOMOTION	
6. LOCOMOTION AND OTHER FOLLOWS	
7. IMMOBILE	
8. IMMOBILE AND OTHER APPROACHES	
9. OTHER TOUCH	
10. OTHER HOLD HARNESS	

Code Definitions:

1. HEAD BANG--Strikes head against object
2. HEAD BANG AND OTHER APPROACHES--Head bang and someone else moves toward client
3. HAND HIT TO FACE--Strikes facial area with hand
4. DROPS TOWARD FLOOR--Buttocks drop towards floor
5. LOCOMOTION--Walks or runs
6. LOCOMOTION AND OTHER FOLLOWS--Walks and someone else moves in same direction alongside or behind client
7. IMMOBILE--Standing with feet still for 3 seconds or more
8. IMMOBILE AND OTHER APPROACHES--Immobile and someone else moves toward client
9. OTHER TOUCH--Someone touches client
10. OTHER HOLD HARNESS--Someone holds onto client's harness