

The Relationship Between Extraversion and Listening Comprehension Under High- and Low-Salience Visual Distraction Conditions: A Pilot Study

Nicole Virzi, Steve Rouse, Cindy Miller-Perrin
Pepperdine University, Malibu, CA

Abstract

This study contributes to the vast pool of research examining the link between level of extraversion and sensory stimulation. A multitude of studies have shown that introverts are more susceptible to forms of auditory distraction than extraverts when completing cognitive tasks requiring visual attention such as reading comprehension and spatial manipulation, and performance on these tasks while in the presence of auditory distraction tends to be lower for introverts than their extraverted counterparts. However, this is the first study to examine the opposite relationship: the differing effects of visual distraction on tasks requiring auditory attention amongst introverts and extraverts. Participants included 90 undergraduate college students attending a small liberal-arts university who completed the Eysenck Personality Inventory to measure their level of Extraversion and were then exposed to three visual distraction conditions in counterbalanced order: 1) Control (no visual stimulation), 2) High-Distractibility Visual Stimulation, and 3) Low-Distractibility Visual Stimulation. During each condition, participants listened to a standardized recording of an auditory comprehension passage. Participant comprehension of passages was assessed through multiple choice questions following each passage. Following both experimental conditions, participants were asked to indicate on a Likert-scale how distracted they were by both levels of visual stimuli. Though results of this study did not support any of the hypotheses, they can be interpreted as lending support to one of two important conclusions: 1) differences in sensory stimulation thresholds and distraction tolerance between introverts and extraverts are not applicable to visual distraction or 2) this study should be interpreted as a pilot study with numerous limitations that can guide future research into this topic. Since previous research has repeatedly shown that introverts are more susceptible to various forms of sensory stimulation and are therefore more distracted by it, we believe that there is more evidence for the latter conclusion. We suggest important directions for future research into a critical phenomenon with implications for educational, workplace, and social settings.

Introduction

- Hans Eysenck (1967) attributed individuals' ability to handle outside distractors to their levels of extraversion as a function of the Yerkes-Dodson law of optimal arousal.
- This theory has been applied to taste sensitivity (Corcoran, 1964) and pain perception (Haslam, 1967) revealing significant differences in sensory threshold levels between introverts and extraverts.
- Recent research has focused on the impact of various forms of auditory distraction amongst introverts and extraverts when completing cognitive tasks requiring visual attention.
- Geen (1984) demonstrated that when completing a paired-associate learning task, introverts performed better when intensity of white noise distraction was lower and extraverts when intensity was higher.
- Both introverts' short term memory and reading comprehension abilities suffered when completed in the presence of music when compared to baseline scores taken during silence, while scores for extraverts did not differ between conditions (Furnham & Bradley, 1997). Introverts found the same level of music to be more distracting than their extraverted counterparts.
- Furnham, Gunter, and Peterson (1994) found that when completing a sample GMAT reading comprehension passage in front of the television, introverts performed significantly worse on passage questions than extraverts.
- The effects of auditory distraction on cognitive tasks requiring visual attention such as reading comprehension as a function of personality type have been studied at length, but there is very limited research that examines the opposite relationship: the effects of visual distraction on auditory comprehension abilities.
- This study was the first to isolate the effects of varying types of visual distraction on auditory comprehension.

Hypotheses

- 1) There will be a negative correlation between level of extraversion and self-reported distraction while under high-salience visual distraction.
- 2) There will be a positive correlation between participants' extraversion score and performance on a listening comprehension task while under high-salience visual distraction.
- 3) The aforementioned correlation will be higher than the correlation between level of extraversion and performance on a listening comprehension task while under low-salience visual distraction.

Method and Materials

Participants

- This study was designed as a within-subjects experiment and involved 111 undergraduates, 90 of which were determined by exclusionary criteria to be fit to be included in the sample— including 47 women and 43 men (M age = 19).

Materials

- Eysenck Personality Inventory (EPI)
- Low-salience distraction (see Figure 1: beach waves video)
- High-salience distraction (see Figure 2: "Looney Toons" video)
- Three listening comprehension passages and accompanying questions
- Self-report distraction questionnaire

Procedure

- Upon arrival, each participant was given a pre-numbered scantron sheet which randomly assigned them to proceed to one of two rooms.
- Each participant filled out the Eysenck Personality Inventory.
- In the first room, participants completed the control condition task before completing the low-salience visual stimulation task followed by the high-salience visual stimulation task.
- To counterbalance conditions, participants assigned to the second room completed the control condition task before completing the high-salience visual stimulation task followed by the low-salience visual stimulation task.
- Each participant listened to a pre-recording of an auditory comprehension passage while viewing the visual stimuli.
- At the end of the study, participants completed a brief questionnaire asking them to rate how distracted they were during each condition.
- The independent variable was type of visual stimulation and the dependent variables were auditory comprehension ability—defined operationally as the percentage of passage questions answered correctly by the participant— and self-reported distraction levels between the different conditions.

Results

- Scores on both the Extraversion scale ($M = 15.31$, $SD = 4.36$) and the Neuroticism scale ($M = 14.04$, $SD = 4.44$) were found to be normally distributed and internally consistent for the sample (for both scales, $\alpha = .79$).
- Scores on the control passage ($M = 5.79$, $SD = 1.43$), first experimental passage ($M = 4.71$, $SD = 1.96$), and second experimental passage ($M = 4.38$, $SD = 1.63$) were found to be normally distributed but not internally consistent. Cronbach's alphas were .37, .61, and .47, respectively.
- The participants in room 1 ($M = 5.46$, $SD = 1.57$) and room 2 ($M = 6.14$, $SD = 1.19$) differed significantly on listening comprehension abilities, $t(88) = -2.302$, $p = .024$.
- Correlations between extraversion scores and both self-reported distraction and listening comprehension scores are shown in Table 1. None of the correlations between Extraversion scores and both self-reported distraction and listening comprehension scores were found to be statistically significant.

Table 1. Correlations: Extraversion, Self-Reported Distraction and Listening Comprehension

	Correlation with Extraversion Scores	Significance
Self-reported distraction		
Control condition	.004	$p = .971$
Waves condition	.033	$p = .755$
Cartoon condition	-.054	$p = .610$
Comprehension scores		
Control condition	-.029	$p = .787$
Waves condition	-.103	$p = .334$
Cartoon condition	-.085	$p = .428$



Figure 1. Low-salience visual distraction



Figure 2. High-salience visual distraction

Conclusions

- The results of the current study did not support any of the three hypotheses.
- There was no significant negative correlation between a participants' Extraversion score and self-reported distraction during the high-salience distraction (cartoon condition).
- There was also no significant positive correlation between participants' Extraversion score and performance on the listening comprehension task while under high-salience visual distraction (cartoon condition), nor was this correlation significantly higher than the correlation between participants' Extraversion score and performance on the listening comprehension task while under low-salience visual distraction (waves condition).
- Though this was the first systematic study to replace auditory distraction with visual distraction as the independent variable, results of this study did not support previous research asserting that differences in susceptibility to auditory distraction between introverts and extraverts could likely be applied to other forms of distraction as well.
- The results of the current study can be interpreted as lending support to one of two conclusions:
 - 1) Differences in sensory stimulation thresholds and distraction tolerance between introverts and extraverts is limited only to various forms of auditory distraction and is not applicable to visual distraction.
 - 2) This study—being the first to test the effect of visual distraction upon listening comprehension abilities between introverts and extraverts—should be interpreted as a pilot study with numerous methodological limitations that can guide future research into this topic.
- Since previous research has repeatedly shown that introverts are more susceptible to various forms of sensory stimulation and are therefore more distracted by it, we believe that there is more evidence for the latter conclusion.

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Contact Information

For more information, please contact Nicole Virzi at nicole.Virzi@Pepperdine.edu

