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How preferred-ear for listening moderates emotional cognitions in the prediction of personality

Chris J. Jackson

University of Queensland, Brisbane, Australia

**In press, *Laterality*.**

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Abstract

Two studies investigate how cognitions of aurally presented information interact with aural preference (self-reported preferred-ear for listening) in the prediction of personality. In Study 1, participants provided attractiveness cognitions of various statements after listening to aurally presented material. Aural preference x attractiveness interactions significantly predicted Extraversion and Neuroticism. In Study 2, participants provided cognitions of pleasantness from various scenarios. An aural preference x pleasantness interaction significantly predicted Neuroticism. Although, other interpretations are possible, I conclude that these findings support the idea of aural preference as a useful measure of hemispheric asymmetry, such that the right hemisphere (left aural preference) provides facilitation of emotional expression whereas the left hemisphere (right aural preference) provides suppression. My findings support a more historical view of emotional asymmetry than the more modern approach-avoidance perspective and suggest that moderating effects of hemispheric asymmetry are important to include in studies investigating emotions associated with personality.

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Introduction

My aim is to develop and test a theory that aural preference (i.e. self-reported preferred-ear for listening) is an important moderator of aural cognitions in the prediction of personality. To achieve this goal, I integrate literature on the cognitive basis of personality, lateralized cognitions and aural preference.

*Predicting personality scales from cognitions*

H. J. Eysenck's (1967) model of personality consists of Extraversion, Neuroticism and Psychoticism. Whilst Eysenck would claim his model is mainly biological, his scales have such high bandwidth that it is unsurprising cognitions are also thought to be antecedents of Extraversion and Neuroticism (see Matthews & Gilliland, 1999 and Corr, 2001 for more information on the biological vs. cognitive debate in personality psychology). With regard to the cognitive antecedents of personality, Extraversion is associated with positive cognitive processing, such as positive affect and increased positive impression; and Neuroticism is related to higher levels of negative cognitive function, such as negative affect and an overall pessimistic impression (Larsen & Ketelaar, 1989; Rusting & Larsen, 1997; Matthews, Derryberry & Siegle, 2000). Anxious individuals show stronger tendencies to interpret ambiguous stimuli in a negative emotional manner, such as selecting 'die' over 'dye' when hearing homophones (Eysenck, McLeod & Matthews, 1987) and show a memory bias for negative information (Gotlib & McCann, 1984).

*Laterality and the cognitive basis of personality*

Early research suggests that emotionally oriented cognitions are asymmetrical in the brain, with the right hemisphere being related to effective and appropriate emotional communication, and the left related to suppression of emotional communication (Tucker & Williamson, 1984). It seems that the holistic processing mode of the right cerebral hemisphere is equipped for the perception, elaboration and expression of emotions (Ali & Cimino, 1997), whereas the analytic detailed processing mode of

the left hemisphere may contribute to personality through the inhibition of emotions, behavioural activation and specialization in complex motor operations (Buck & Duffy, 1980; Tucker & Newman, 1981; Tucker & Frederick, 1989; Tucker & Williamson, 1984). Other early research supports the antagonistic emotional activity between the two cerebral hemispheres (Buck & Duffy, 1980; Charman, 1979; Dien, 1999; Tucker, Antes, Stenslie & Barmhardt, 1978; Tucker & Newman, 1981).

Recent research by Davidson and colleagues (Davidson, 1995; 1998; Davidson & Sutton, 1995) as well as others (e.g. Miller & Cohen, 2001) reinterprets evidence for emotional cerebral asymmetry in terms of approach and avoidance (Gray, 1981, 1987; Gray and McNaughton, 2000) which are widely regarded as the basis of personality (Carver, Sutton & Scheier, 2000; Elliot & Thrash, 2002; Gable, Reis & Elliot, 2003; Jackson, 2001; 2002; 2003; Jackson & Francis, 2004; Jackson & Smillie, 2004). Studies show elevations in right anterior cortical activation when exposed to unpleasant film clips (Davidson, Ekman, Saron, Senulis & Friesen, 1990) and when punishment is threatened (Sobotka, Davidson & Senulis, 1992). Higher levels of left anterior cortical activity have been reported among adults presented with incentives (Sobotka et al., 1992), with positive emotional adjectives (Cacioppo & Petty, 1980) and with pleasant word-pairs (Sutton & Davidson, 2000). Similar asymmetries have been reported in resting cerebral activity and its susceptibility to affect (Tomarken, Davidson, Wheeler & Doss, 1992; Wheeler, Davidson & Tomarken, 1993). For example, Pizzagalli, Nitschke, Oakes, Hendrick, Horras, Larson, Abercrombie, Schefer, Koger, Benca, Pascual-Marqui, & Davidson (2002) report that depressed subjects showed more excitatory activity in the right superior and inferior frontal lobe (Brodmann's area) than comparison subjects. It also seems self-reports of motivational and emotional responses to threats and incentives show good relationships with left and right resting frontal activation (Harmon-Jones & Allen, 1997; Sutton & Davidson, 1997). Overall, there is good evidence in favour of lateralization of approach and avoidance in the left and right anterior regions of the cerebral cortex respectively, but not all research supports this perspective. For example, higher levels of right posterior cortical activity have been associated with anxiety (Heller, Nitschke, Etienne &

Miller, 1997) and anterior brain activity was reported as unrelated to reactivity of positive and negative emotional stimuli (Hagemann, Naumann, Backer, Maier, Barussek, 1998).

Whilst the approach-avoidance perspective might be considered pre-eminent in modern research, it may not be the most convenient set of terms with which to view the relationship between all emotionally based cognitive antecedents of personality, unless the cognitions are specifically designed to follow the approach-avoidance perspective. In this study, it seems more useful to use the earlier and more general terminology of emotional facilitation (in which emotions are expressed) in the right hemisphere and antagonistic suppression of emotions in the left hemisphere (in which emotions are inhibited) to describe the effects of lateralization on a variety of cognitions unrelated to approach and avoidance goals.

My perspective is not necessarily in complete conflict with approach-avoidance terminology when cognitions are negative. Expression of negative emotions leads to avoidance (right hemisphere) and suppression of negative emotions might be seen as leading to approach and activation behaviour (left hemisphere) as a result of disinhibition (which is approach behaviour resulting from lack of the inhibition associated with the expression of negative emotions). My perspective does however differ from approach-avoidance in how positive emotions are treated. In the proposed model, all emotional cognitions are appropriately expressed using the right hemisphere whereas in the approach-avoidance perspective only negative emotions are expressed using the right hemisphere.

#### *Self-reported aural preference and laterality*

The network of auditory pathways ascending from the auditory nerve to the cortex of the brain contain both ipsilateral and contralateral components, although the contralateral pathway is thought to be superior (Kiernan, 1998; Pinel, 1997; Springer & Deutsch, 1989). There is therefore the possibility that individuals who prefer the *right ear* have a *left hemispheric preference* for processing of auditory stimuli, while people who prefer the *left ear* have a *right hemispheric preference* (see Seeman & Surwillo, 1987).

Aural preference has attracted little theoretical research (Porac & Coren, 1981) and virtually none in the field of personality (except for Jackson, Furnham & Miller, 2001). The situation is further confused because studies examining aural preference have yielded varying results, and often aural preference is confused with differential aural ability. Support for aural preference as an index of possible lateral preference stems from recent research suggesting telesales staff who choose a left ear headset (indicative of left aural preference), after controlling for other factors (such as location, number of calls etc.), were found to out-sell those staff choosing a right eared headset (Furnham, Richardson & Miller, 1997). A different sample of telesales staff confirmed that ear preference in interaction with Social desirability was a significant predictor of performance as rated by superior staff (Jackson et. al., 2001). Against the notion is research suggesting that in real world tasks, such as telephone listening, no consistent aural preference has been found to support laterality arguments (Seeman & Surwillo, 1987; Surwillo, 1981). A further reason for distrust of a relationship between aural preference and laterality lies in the likely cause of ear preference. Whilst some researchers claim a genetic basis, which might add strength to the laterality argument (Reiss & Reiss, 1999), other researchers claim the causal basis of ear preference is largely determined by relatively trivial environmental variables (e.g. Furnham, et al., 1997; Noonan & Axelrod, 1981), peripheral cochlear mechanisms (Reiss & Reiss, 1998) or pre-natal variables (Previc, 1991).

As noted above, there is a distinction between aural preference (measured by self-report questionnaire) and aural performance (usually measured by means of a dichotic listening task). Reiss & Reiss (1998), for example, report a non-significant correlation between aural preference and dichotic listening. A right ear advantage has been consistently recorded when competition takes place between the auditory pathway in dichotic listening tasks (e.g. Kimura, 1967, Reiss & Reiss, 1998) and therefore the relationship between dichotic listening and laterality is much more clearly understood (e.g. see Surwillo, 1981) although some studies find no supporting evidence (Schulter, Kreuzthaler & Pfurtscheller, 1990) and Poreh, Whitman, and Ross (1994) failed to show that ear dominance was

Aural preference, cognitions and personality related to creative thinking. The focus of this paper is aural *preference* as a predictor of personality. Since personality is defined in terms of behavioural *preferences* as opposed to ability, it seems likely that preferences (aural and personality) are more related than a mix of aural ability and personality preferences.

In summary, emotional cognitions are at least a partial basis for personality scales of Extraversion and Neuroticism. It seems likely that cognitions are lateralized such that the left hemisphere is responsible for emotional suppression whilst the right hemisphere is responsible for emotional expression. Moreover, it is possible that there is a link between aural preference and contralateral hemispheric preference for the analysis of aurally induced cognitions. It is important to note however that the link between aural preference and contralateral hemispheric preference is far from proven.

### *Overview of studies*

The present two laboratory studies explore interactions between aural preference and cognitive assessments in the prediction of Eysenck's higher order scales of personality. Each study examines different cognitions that lead to differing predictions of their likely relationship with personality scales.

#### Study 1: Prediction of personality from attractiveness cognitions moderated by aural preference

Study 1 predicts Eysenck's personality scales from attractiveness cognitions of aurally presented information and determines if they are moderated by aural preference. I use attractiveness cognitions since they should be related to Extraversion such that extraverts are likely to feel more attractive than introverts, and Neuroticism such that emotionally stable people are likely to feel more attractive than neurotics (Eysenck, McLoud & Matthews, 1987; Gotlib & McCann, 1984; Larsen & Ketelar, 1989; Rusting & Larsen, 1997; Matthews, Derryberry & Siegle, 2000). Attractiveness is

unlikely to be related to Psychoticism. The following hypothesis is tested: Attractiveness cognitions will be moderated by aural preference in the prediction of Extraversion and Neuroticism.

## Method

### *Participants*

Eighty-nine retail assistants voluntarily participated in the study of which 40 were drawn from the first year subject pool at the University of Queensland and 49 were drawn from local retail outlets. The final sample consisted of 64 females and 25 males with age ranging from 17 – 56, with an average of 22.96 years ( $SD = 8.13$ ).

### Procedure

#### *Materials and Measures*

*Cognitions*: An assessment task of 20 ratings was devised to assess cognitive attractiveness of oneself from aurally presented information. Examples of items included how attractive it would be (for oneself) to make good sales, work well independently, and contribute to the company. Attractiveness items, along with instructions of how to complete the questionnaire, were recorded on tape and aurally presented to the participant using headphones. During a five second interval between items, participants recorded on paper their cognitive assessments of attractiveness on a five point scale in which a high score represented high attractiveness.

*Lateral Preference Questionnaire*: Additional items were added to the Lateral Preference Inventory (Coren, Porac & Duncan, 1979) that provides a measure of: handedness, footedness, eyedness and earedness. Coren et al.'s measure of lateral preference has demonstrated 92% concordance between self-reports and direct behavioural performance (Coren, Porac & Duncan, 1979; Porac & Coren, 1981). In this study, footedness items were discarded and additional items were developed to provide a 7-item aural preference scale, a 5-item eye preference scale and a 10-item hand preference scale.

### *Personality assessments*

*Eysenck Personality Questionnaire – Revised:* The revised version of the Eysenck Personality Questionnaire (EPQ-R; Eysenck, Eysenck & Barrett, 1985) was administered which measures Psychoticism, Extraversion and Neuroticism.

### *Method*

*Audio Task:* Participants listened to the attractiveness statements using headphones. Each statement was presented three times: once through the right ear, once through the left, and once in stereo. The order of these presentations was counterbalanced across participants in a latin square design to ensure that no order effects would be present in the results.

*Written Task:* Participants completed the personality and lateral preference questionnaires.

### *Data analysis*

I used hierarchical moderated multiple regression to predict my dependent variables (Extraversion, Neuroticism and Psychoticism) from mean centred aural preference and self-attractiveness ratings. In Step 1, sex and age effects were entered. In Step 2, lateral preference and attractiveness ratings were entered. In Step 3, the aural preference x attractiveness interaction term was entered. All variables within each step are entered at the same time and the methodology is equivalent to classical ANOVA with the advantage of allowing use of continuous data for independent variables. It should be noted that whilst hierarchical regression is technically the correct procedure to control the advancement of the regression process, and that order of variables within each step can be important, I obtain virtually the same results in all my analyses when entering all variables in one step and using the opposite order of variable entry.

## Results and discussion

Means, standard deviations, alpha coefficients, and correlations between variables are shown in Table 1. All alpha coefficients are greater than 0.74. Lateral preferences are uncorrelated with self-attractiveness cognitions, are moderately intercorrelated (all correlations are between .40 and .49) and

Aural preference, cognitions and personality are uncorrelated with all the personality scales. Attractiveness correlations are significantly correlated with Extraversion ( $r = .29, p < .05$ ), have a negative trend with Neuroticism and are significantly negatively correlated with Psychoticism ( $r = .25, p < .05$ ). These correlations suggest that there is not a very strong relationship between attractiveness cognitions and personality.

#### *Moderating effect of aural preference*

I found significant aural preference x self attractiveness cognition interactions in the prediction of Extraversion and Neuroticism..  $R^2$  was .13 in the prediction of Extraversion and .15 in the prediction of Neuroticism with  $\Delta R^2_{\text{Step 2} \rightarrow 3}$  .05 and .04 respectively. Plots of the significant interaction terms are shown in Figure 1 (see Aiken & West, 1991 and Jaccard, Turrisi & Wan, 1990). Simple slopes analysis shows that the two slopes in each of the plots are significantly different from zero. People with a left aural preference show the intuitively appropriate relationship such that high self attractiveness is related to high Extraversion ( $t = 3.78, df = 85, p < .001$ ) and low self attractiveness is related to high Neuroticism ( $t = -2.33, df = 85, p = .02$ ). People with a right aural preference show an unexpected relationship such that low self-attractiveness is related to high Extraversion ( $t = 2.00, df = 85, p = .04$ ) and high self-attractiveness is related to Neuroticism ( $t = 2.00, df = 85, p = .05$ ).

I interpret my results in terms of lateral hemispheric preference (in which left ear preference denotes right hemispheric preference and right ear preference denotes left hemispheric preference). Results suggest very different relationships exist between people who have different aural hemisphere preferences. People who prefer to use their right hemisphere (indicated by left aural preference) have relationships between cognitions and personality in a foreseeable and appropriate way, such that high self attractiveness is related to high Extraversion and low Neuroticism. This suggests that the right hemisphere facilitates appropriate emotional expression. However, people who prefer to use their left hemisphere (right aural preference) have an opposite and much less foreseeable effect. Here high attractiveness cognitions are associated with *low* Extraversion and *high* Neuroticism. This suggests that the left hemisphere acts as a suppressor of appropriate emotions.

No significant Step 3 interaction terms were found in the prediction of Psychoticism from aural preference, or when using hand and eye preferences as main effects and interaction terms in the prediction of any of the personality scales. This finding supports the idea that attractiveness is not a cognition related to Psychoticism. The lack of effect when using hand and eye preference was in line with previous findings that suggest aural preference is the important moderating variable (as suggested by Jackson et al., 2001).

### Study 2: Predicting Neuroticism from more directly related cognitions and the moderating effect of ear preference

In Study 1, I argued that attractiveness was a general cognition likely to underlie both Extraversion and Neuroticism. In Study 2, I focus on predicting just Neuroticism from aurally induced pleasantness cognitions and aural preference. This is based on the premise that pleasantness is an emotional cognition associated with just Neuroticism, such that stimuli are likely to be interpreted as unpleasant in neurotics and more pleasant in emotionally stable people.

### Method

#### Participants

Eighty-two psychology students (18 males and 64 females) from the University of Queensland received course credit for their participation in the present study. The mean age of participants was 19.5 years.

#### Procedure

##### *Materials and measures*

*Aural task:* The aural task involved playing an audiotape to each participant. The tape consisted of 3 blocks of 100 scenarios each that briefly described a hypothetical event of varying pleasantness. During a three second pause between each scenario presentation, participants indicated their pleasantness

Aural preference, cognitions and personality cognitions on a nine-point rating scale: 1 = Extremely unpleasant, 5 = Neither pleasant nor unpleasant, 9 = Extremely pleasant. A balanced design was used such that ear of presentation of each block varied randomly between left ear, right ear and stereo.

*Written task:* Questionnaires employed in the present study measured personality and lateral preference – the EPQ-R (Eysenck, Eysenck & Barrett, 1985), and the Lateral preferences questionnaire provided by Porac & Coren (1981). The latter inventory is designed to assess hand, foot, eye and ear preference, and contains 16 items, four of which are specific to each index. The items have been successfully validated against various performance measures (Porac & Coren, 1981). The order of presentation of questionnaires was randomized.

## Results

Table 3 shows the means, standard deviations and reliability coefficients for the variables of interest. Alpha reliabilities are all more 0.7, except for Psychoticism ( $\alpha = .64$ ) and Foot preference ( $\alpha = .68$ ). All the different lateral preferences are significantly intercorrelated except for eye preference. Lateral preferences are not significantly correlated with personality scales and with cognitions of pleasantness. No scale of personality is significantly correlated with cognitions of pleasantness.

Table 4 presents the results of the hierarchical moderated regression, in which Step 1 variables were sex and age, Step 2 variables were aural preference, pleasantness cognitions, and Step 3 variables were aural preference x pleasantness interaction terms. With regard to pleasantness cognitions, there were no main effects, but a significant pleasantness x aural preference interaction was found (Figure 2). The addition of the Step 3 interaction term explained 9% more variance. Simple slopes analysis shows both slopes are significantly different from zero. Similar to Study 1, people with a left aural preference show that low pleasantness is associated with high Neuroticism as could be expected ( $t = -2.09$ ,  $df = 76$ ,  $p = .04$ ). However, people with a right ear preference show an unexpected relationship such that high pleasantness is associated with high Neuroticism ( $t = 2.00$ ,  $df = 76$ ,  $p = .05$ ).

Based on the assumption of a relationship between aural preference and hemispheric preference, this suggests that cognitions of pleasantness in the right hemisphere are appropriate in that they negatively predict Neuroticism, whereas cognitions of the left hemisphere *positively* predict Neuroticism. The right hemisphere seems to be acting to facilitate the appropriate emotions whereas the left hemisphere is acting to suppress them.

No Step 2 or Step 3 terms were significant in the prediction of the other personality scales (Extraversion and Psychoticism). Similar to Study 1, when eye, hand and foot preferences were substituted for aural preference, no Step 2 or Step 3 terms were significant. These results support the idea that pleasantness is mainly a cognition associated with Neuroticism and that aural preference is a better moderator of cognitions as antecedents of personality than eye, hand and foot preferences.

#### General discussion

My studies identify and replicate evidence in favour of aural preference as a moderator of cognitions as antecedents of various scales of personality. I interpret my findings of aural preference in terms of lateralized hemispheric preference for the processing of aural information. My results suggest that the right hemisphere acts as a facilitator of appropriate emotions whilst the left hemisphere acts as a suppressor of appropriate emotions. Specifically, in Study 1, I report that Extraversion and Neuroticism have similar but opposite relationships with attractiveness cognitions. Thus the right hemisphere is responsible for an appropriate relationship between attractiveness and Extraversion such that high attractiveness is related to high extraversion, and a negative relationship between attractiveness and Neuroticism such that high attractiveness is related to low neuroticism. The left hemisphere provides the opposite relationship and would seem to therefore act as a suppressor of appropriate emotions. In Study 2, I report a similar kind of interaction between hemispheric preference and pleasantness cognitions in the prediction of Neuroticism. All this supports the contention that the right hemisphere is related to appropriate cognitive emotional expression (Tucker, 1981; Tucker & Frederick, 1989). My studies also suggest that there may be an opposite system of cognitions in the

least preferred hemisphere, which seems to work in antagonism to the expected system (Buck & Duffy, 1980). The notion that the hemispheres work in antagonism in the facilitation and inhibition of Extraversion and Neuroticism is implied in the work of other researchers (e.g. Tucker, 1981; Tucker & Frederick, 1989), and the more recent work of Davidson (e.g. Davidson, 1995; 1998; Davidson & Sutton, 1995).

Psychoticism was not predicted from the cognitions used in the two studies reported here. Since neither main effect nor interaction terms were significant in the regressions, this suggests that attractiveness and pleasantness cognitions have little relationship with Psychoticism. This is a finding entirely consistent with what is known about the non-overlapping definitions of these constructs. Further studies need to determine if cognitions more related to Psychoticism (such as vengefulness and emotional detachment) show a lateralized effect.

Moreover, I also report that hand, ear and foot preferences are not moderators of aurally induced cognitions. Such negative findings tend to support the construct validity of the model presented here since my consistent results are limited to just the variables identified to be of interest from previous research (Jackson et al., 2001). It remains to be seen if these preferences act as moderators for information presented in the same mode (i.e. if eye preference is a moderator of visually presented information) or if aural preference is in fact an indicator of general laterality above and beyond aurally presented information.

In line with earlier research by Jackson et al. (2001), laterality information may add incremental validity to studies investigating the basis and application of personality. In these studies, the link between cognitions as antecedents of personality become a lot more meaningful once an interaction term including aural preference is included. It remains to be seen how important aural preference is in the prediction of real world behaviour.

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Table 1

Means, standard deviations and correlations between variables in Study 1

				Preference			Personality		
	M	SD	Self	Hand	Aural	Eye	N	P	E
*									
Cognition of Self attractiveness	4.18	.54	.98						
Hand	4.36	.99	-.09	.95					
Aural	3.39	1.03	-.02	.49*	.90				
Eye	3.86	1.18	-.07	.44*	.40*	.93			
N	11.29	5.45	-.13	.09	-.03	.14	.87		
P	7.32	3.99	-.25*	-.11	-.11	-.03	-.13	.74	
E	16.55	4.81	.29*	-.09	.08	-.03	-.37*	.06	.86

$p < .05$  \*\*  $p < .01$

Alpha reliabilities are shown in the diagonal

Table 2

Prediction of personality from personal attractiveness cognitions and aural preference

<u>Extraversion</u>		$\beta$	$t$	$p$	$R^2$	$\Delta R^2$
Step 1	Age	-.10	-.89	ns		
	Sex	.01	.14	ns	0	.00
Step 2	Cognition of Self attractiveness	.26	2.28	.03		
	Aural preference	.15	1.43	ns	.11	.11
Step 3	Self x Aural Preference	-.24	-2.19	.03	.15	.04
<u>Neuroticism</u>						
Step 1	Age	-.04	-.37	ns		
	Sex	.21	1.98	ns	.06	.00
Step 2	Self Aural preference	-.04	-.34	ns	.07	.01
Step 3	Self x Aural Preference	.27	2.37	.02	.13	.06

Table 3

Means, standard deviations and correlations from Study 2

					Preferences			Personality		
	Mean	SD	Pleas	AP	EP	HP	FP	E	N	P
Cognition of Pleasantness (pleas)	7.31	.63	.93							
Aural Preference (AP)	1.36	2.33	.01	.70						
Eye Preference (EP)	1.78	3.04	-.10	.10	.93					
Hand Preference (HP)	3.43	1.67	-.14	.38**	.08	.86				
Foot Preference (FP)	2.32	2.06	-.16	.36**	.10	.63**	.68			
E	14.57	5.35	.19	-.03	.09	.02	-.13	.88		
N	12.41	5.64	.06	.04	.03	.11	.02	.04	.87	
P	5.82	3.66	.10	.05	.11	-.03	.10	.21	-.18	.64

\* p &lt; .05 \*\* p &lt; .01

Alpha reliabilities are shown in the diagonal



Table 4

Prediction of Neuroticism from aural preference and pleasantness cognitions

		$\beta$	$t$	$p$	$R^2$	$\Delta R^2$
Neuroticism						
Step 1	Age	-.06	-.56	ns		
	Sex	-.22	-2.06	.04	.05	.00
Step 2	Aural preference	.01	.10	ns		
	Pleasantness rating	.11	1.02	ns	.06	.01
Step 3	Pleasantness x Aural preference	.32	2.94	<.01	.15	.09

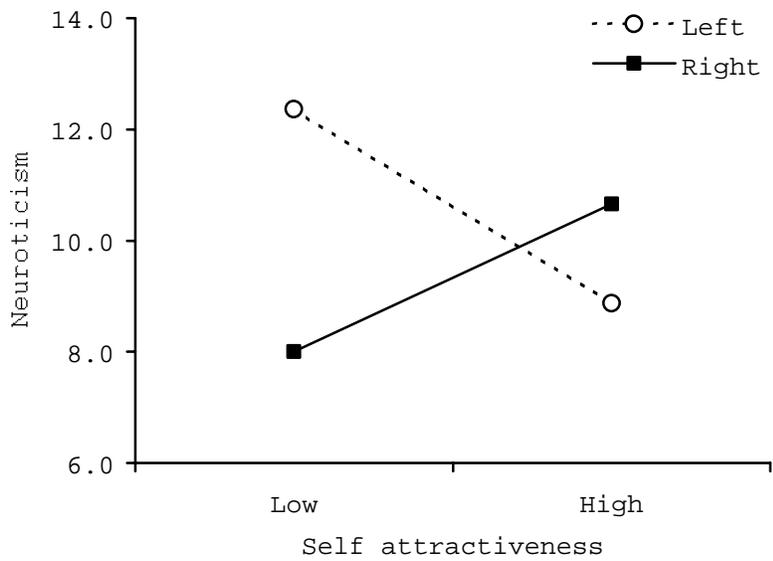
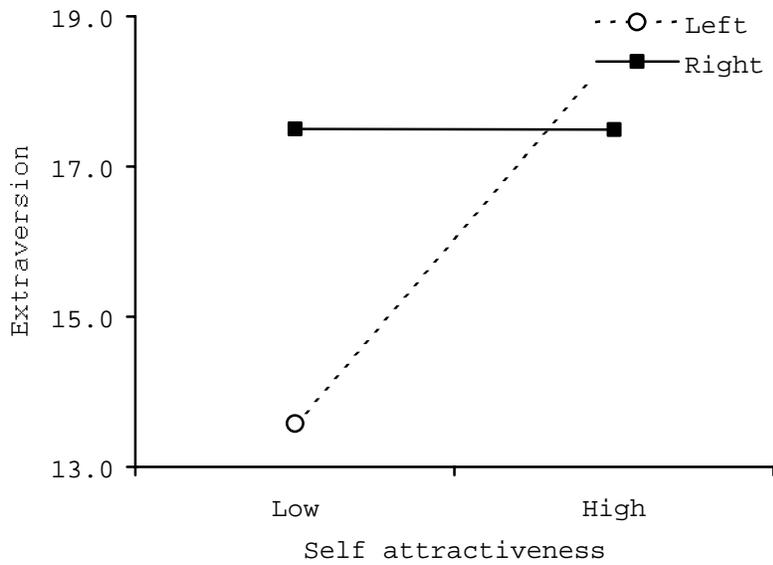


Figure 1

Study 1: Predicting Extraversion and Neuroticism from the interaction between aural preference (left, right) and self-attractiveness cognitions

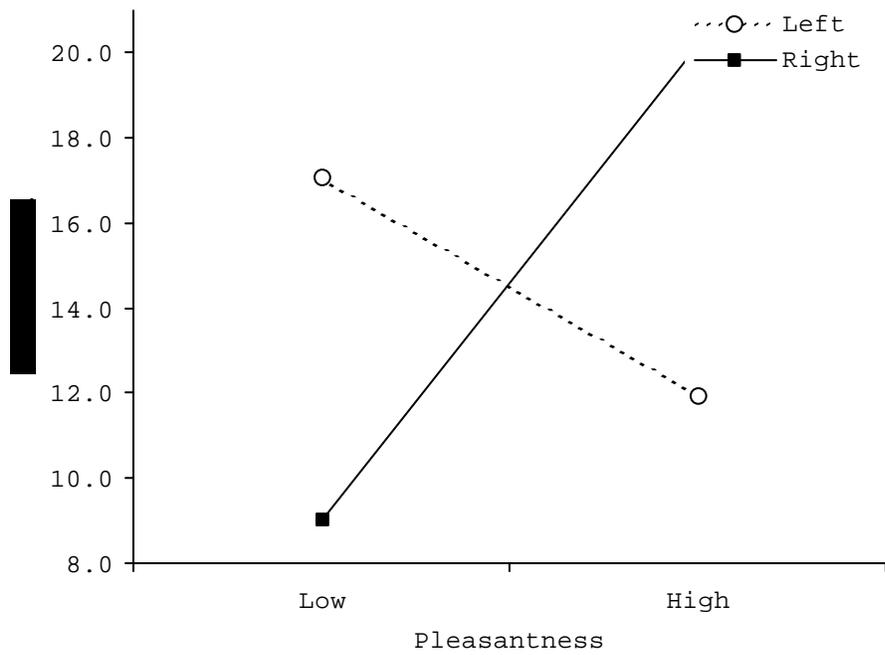


Figure 2

Study 2: Predicting Neuroticism from the interaction between aural preference (left, right) and pleasantness cognitions