universität wien

Diplomarbeit

Titel der Diplomarbeit

BEHOLDING BEAUTY:

Manipulating the Influence of Private and Shared Taste on Judgements of Facial Attractiveness and Appreciation of Abstract Art

Verfasserin

Tanya Rigotti

Angestrebter akademischer Grad

Magistra der Naturwissenschaften (Mag. rer. nat.)

Wien, 2014

Studienkennzahl:	A 298
Studienrichtung:	Diplomstudium Psychologie
Betreuer:	Univ.-Prof. Dipl.-Psych. Dr. Helmut Leder

“***Beauty is no quality in things themselves:***
It exists merely in the mind which contemplates them;
and each mind perceives a different beauty”

David Hume, “Of the Standard of Taste“ (1757)

Acknowledgements

I would like to thank my colleagues and friends at the Department of Basic Psychological Research. To Helmut, thank you for allowing me to follow my research interests, and for your constant encouragement and patience. To Michael, Jürgen, and Andy, thank you for all the statistical help. To the basement crew, thank you for your open ears and continued support. Un ringraziamento particolare va alla mia famiglia: per il supporto morale durante gli ultimi anni e per tutti i sacrifici grazie ai quali ho potuto dedicarmi al mio percorso universitario. Thank you to everyone else who contributed to this thesis seeing the light of day – you know who you are.

Abstract

Recent attractiveness research states that standards of beauty are not exclusively rooted in our biology, but also in personal learning histories. Similarly, the appreciation of abstract art is considered to be inherently subjective, with individual taste being brought on by personal associations and interpretations. In the present thesis, the relative contribution of shared and private taste on facial attractiveness and abstract art ratings is investigated with a task instruction manipulation. Results provide initial evidence that raters' judgements of facial attractiveness can be influenced by soliciting an either shared or private taste response through the task instruction. As hypothesised, this manipulation did not show the same pattern in the abstract art condition, where greater opportunities for individual, diverging taste are granted.

Contents

BEHOLDING BEAUTY:

Manipulating the Influence of Private and Shared Taste on Judgements of Facial Attractiveness and Appreciation of Abstract Art

Introduction

Physical attractiveness is a salient piece of information that defines social interactions: It is the main determinant of partner choice in a variety of different cultures, with both men and women valuing it highly (Buss, 1989), among having many other social advantages (e.g. Dion, Berscheid, & Walster, 1972; Feingold, 1992). The study of attractiveness has a long tradition in aesthetics research, and has yielded some compelling evidence for shared taste, i.e. collective preferences rooted in our evolutionary history (Langlois et al., 2000). Yet at the same time, the old adage states that "beauty is in the eye of the beholder", and the popular belief is that standards of beauty are nothing more than arbitrary cultural conventions (Yu & Shepard, 1998). Some research lends support to this point of view, suggesting that personal learning histories and social goals may shape individual taste in facial preferences (Zebrowitz & Rhodes, 2002). Other studies investigating the relative influence of shared and private taste have even found that individual taste accounts for roughly half of the meaningful variance in attractiveness ratings (Hönekopp, 2006; Lucker, Beane, & Guire, 1981).

The production and appreciation of visual art is a defining attribute unique to human experience, yet psychology has not devoted much attention to its study until recently (Silvia, 2005). The majority of empirical studies on the subject essentially try to identify common visual properties that determine preferences (such as complexity, symmetry, novelty, and prototypicality), while largely ignoring internal factors. In a field that is assumed to be inherently subjective, individual taste, brought on by personal associations and interpretations, has long been ignored. As shared preferences for certain types of artworks have been found to be driven by shared semantic interpretations (Vessel & Rubin, 2010), abstract artworks offer an intriguing research focus due to their lack of meaningful content, effectively making them the only objects that can be differentiated only by their style of depiction rather than their content. Abstract paintings usually yield low observer agreement in preferences (Vessel & Rubin, 2010), which is most likely because they provide greater possibilities for diverging interpretations.

In the present thesis I investigate the relative contribution of shared and private taste on two independent areas of interest: Facial attractiveness, and abstract art. The methodology pursued is heavily based on a study by Hönekopp (2006), with an added manipulation: By splitting the participants into two "extreme groups", i.e. a shared and private taste group differing in their task instruction, I hope to elicit responses congruent with either shared or private taste, respectively. Such a manipulation has not been tried before, and will offer further insight into whether the impact of the two taste components can be influenced by instructing the participants a certain way.

I first describe the state of the art in facial attractiveness as well as art appreciation research from a both nomothetic and idiographic approach. I also present Hönekopp's study in depth, including the new statistical approach he proposes to disentangle the relative influence of shared and private taste, before deriving the expected results of the present study from previous research. I then describe the experiment conducted, which is designed to further investigate the relative influence of collective and individual preferences on facial attractiveness and abstract art ratings, before finally describing the results in a discussion. Limitations of the present study and implications for future research are also considered.

1 Facial attractiveness

Physical, and in particular facial, attractiveness influences many different aspects of human interaction. For instance, people preferentially date and mate with physically attractive individuals (DeBruine & Jones, 2006), but attractiveness has also been found to be of importance in social contexts that go beyond mate selection.

Stereotype research has shown that physical attractiveness is associated with a variety of positive characteristics. For example, attractive people are perceived as more sociable, extroverted, intelligent, socially skilled, dominant (Feingold, 1992), and healthy (Buss & Barnes, 1986), and are believed to lead happier and more successful social and professional lives than less attractive individuals (Dion et al., 1972). Attractive people are treated more favourably than unattractive ones, even by those who know them (Langlois et al., 2000), and attractiveness even influences judgements about the seriousness of committed crimes (Sigall & Ostrove, 1975). Physical attractiveness also has the biggest influence on the perception of employment suitability (Gilmore, Beehr, & Love, 1986), and clear evidence of an attractiveness bias has been found even when the judgements were provided by professional and experienced interviewers (e.g. Dipboye, Fromkin, & Wiback, 1975; Marlowe, Schneider, & Nelson, 1996). Even parental behaviour is influenced by physical attractiveness: Attractive newborns receive more maternal attention, and their mothers show a more affectionate and playful behaviour compared with those of less attractive babies (Langlois, Ritter, Casey, & Sawin, 1995).

In short, it has consistently been shown that people tend to ascribe a variety of socially desirable traits to attractive individuals, a phenomenon known as the “what is beautiful is good”-heuristic (Dion et al., 1972; Feingold, 1992; Langlois et al., 2000). Due to the obvious and quite extensive advantages of being attractive, the aspects of what exactly characterises facial attractiveness, as well as why certain preferences have evolved, must be addressed. In the following chapter, I provide an overview of the three best markers for biologically based beauty standards, as well as the two possible evolutionary mechanisms that may have shaped these preferences. I then introduce three broad areas that might contribute to individual differences in taste, as well as the study on which the present thesis is largely based.

1.1 Biologically based standards of beauty

Contrary to the widely held belief that standards of attractiveness are gradually learned and subjective, the great majority of researchers agree that there is a consensus of taste, i.e. the bulk of research since the 1970s seemingly suggests that our sense of beauty is innate and widely shared, even across cultures (see Langlois et al., 2000, for a meta-analytic review). This high agreement between raters is a well-documented and robust finding in the field of aesthetics, and has been interpreted as an indication that people all over the world use similar criteria when judging facial attractiveness (Cunningham, Roberts, Barbee, Druen, & Wu, 1995; Little & Perrett, 2002). This would indicate that standards of attractiveness are not culture-dependent and arbitrary, but rather have a biological basis.

Indeed, humans are interested in what we define as "beauty" from the moment they come into this world: One of the striking findings in facial attractiveness research is that even 14-hour-old newborns differentiate between faces, and prefer to look at those which adults rated as attractive (Slater et al., 1998). Older infants also look longer at attractive faces (Langlois et al., 1987), a preference which has been found to extend to faces differing in gender, sex and age (Langlois, Ritter, Roggmann, & Vaughn, 1991). By their first birthday, infants also tend to look at an attractive face when listening to a pleasant voice. This preference evolves before cultural standards are likely to have been assimilated, making it unlikely to be something that is gradually learned through socialisation from parents, peers, or media, further suggesting that the preference for attractive faces is either innate or acquired very early as part of basic processes of perceptual development (Rubenstein, Langlois, & Roggmann, 2002).

In the following sections, I briefly describe the three main traits that have been proposed to explain this early preference for attractive faces, namely symmetry, averageness, and sexual dimorphism. All three traits have received empirical support, have been shown to be attractive in both male and female faces across cultures, and are believed to advertise the genetic quality of an individual, thus making them good candidates for biologically based beauty standards (see Little, Jones, & DeBruine, 2011, or Rhodes, 2006, for meta-analytic reviews).

1.1.1 Symmetry

Fluctuating asymmetry (FA), i.e. random deviations from perfect symmetry in bilaterally paired traits (Valen, 1962), has been found to be an indicator of developmental instability, which in turn indicates the inability of an organism to cope with genetic and environmental stress (such as mutations, food scarcity, etc.). While the optimal outcome of most characteristics is towards symmetry, pathogens disrupt growth asymmetrically throughout development. A high degree of FA is therefore associated with problems in development, while symmetry signals the optimal expression of the genotype and thus resistance against parasites and other adverse environmental factors (Møller, 1997; Møller & Thornhill, 1998; Thornhill & Gangestad, 1999; Thornhill & Møller, 1997). Thus, a preference for symmetrical individuals should provide direct (e.g. by avoiding contagion), as well as indirect benefits (e.g. by providing good genes for offspring) (Little, Jones, DeBruine, & Caldwell, 2011b).

This "good genes" theory is supported by the findings that FA in human bodies increases with inbreeding, premature birth, psychosis, and intellectual disability (Livshits & Kobylianksi, 1991, as cited in Rhodes, 2006), as well as by increasing health challenges during development. Consequently, symmetry can be assumed to be a valid indicator of mate quality, and may be relevant in mate selection. An increase in the symmetry of a face has in fact been shown to be positively correlated to attractiveness ratings of both male and female faces in various studies and across cultures (e.g. Grammer & Thornhill, 1994; Perrett et al, 1999; Rhodes, Proffitt, Grady, & Sumich, 1998; Rhodes et al., 2001).

Further indirect evidence for the attractiveness of symmetric faces has been found in studies focusing on sperm competition: More symmetrical men tend to have more lifetime sexual partners (Thornhill & Gangestad, 1994, as cited in Baker, 1997), more extra-pair intercourse (i.e. sex outside a current relationship), and also tend to have sex with women after a shorter period of courtship. These correlations could not be explained by the men's social and socio-economic status (Gangestad & Thornhill, 1997, as cited in Baker, 1997). Additionally, more symmetrical men inseminate more (Baker, 1997) and higher quality (Manning, Scutt, & Lewis-Jones, 1998) sperm at each copulation, and their mates report significantly more high-sperm-retention-orgasms (i.e. those occurring close to ejaculation, increasing the likelihood of successful conception)

(Thornhill, Gangestad, & Comer, 1995). Likewise, breast symmetry in females has been found to be positively correlated with fecundity and phenotypic quality (Manning et al., 1997). While there surely are other valid indicators of genetic fitness (cf. the following sections), FA is currently considered to be best (Gangestad & Simpson, 2000).

1.1.2 Averageness

An average face is one with features and a facial configuration representative of the population average, i.e. not a common face, but rather one without distinctive features (Rhodes, 2006). Several researchers have proposed that average traits reflect the ability to withstand developmental pressures, while deviations from the average phenotype indicate developmental instability (Møller, 1997; Møller & Thornhill, 1998; Thornhill & Gangestad, 1999; Thornhill & Møller, 1997). Averageness has therefore been proposed as another biological factor indicative of mate quality by signalling "good genes", such as heritable disease resistance, etc. (cf. section 1.1.1).

Composite faces (obtained by mathematically averaging multiple portraits into one) are consistently judged as more attractive than the individual faces that make up the composite, an early finding dating back to Galton (1879). The more faces make up the composites, the higher their attractiveness rating (Langlois & Roggman, 1990). These findings were statistically significant and robust and could be generalised to a cross-cultural sample of judges (Apicella, Little, & Marlowe, 2007; Pollard, 1995; Rhodes et al., 2001), different stimuli (such as composite line drawings and caricatures) (Rhodes & Tremewan, 1996), as well as to infants (Rubenstein, Kalakanis, & Langlois, 1999). The results were also replicated by using facial stimuli obtained by using a variety of more sophisticated averaging methods (e.g. Grammer, Fink, Juette, Ronzal, & Thornhill, 2002; Rhodes, 2006; Rhodes, Sumich & Byatt, 1999; Rubenstein et al., 2002).

As composite faces possess a high degree of bilateral symmetry and other enhancing artefacts (such as smooth skin produced by the averaging techniques), the importance of averageness as a predictor for perceived attractiveness has been criticised, and its dissociation from other factors was deemed problematic (Alley & Cunningham, 1991). Since this initial critique, research has shown that when potential confounding variables are statistically controlled, averageness is still positively and

independently correlated with attractiveness ratings (e.g. Jones, DeBruine, & Little, 2007; Rhodes et al., 1999).

These findings suggest that faces representative of the central tendency of a population are considered attractive. This has been interpreted as evidence for an evolutionary process of stabilising selection towards averageness. Johnson (1976, as cited in Pollard, 1995) defines stabilising selection as recognising the population average of a particular trait as the optimum class, and selecting against deviations from it. As the mechanism underlying this preference, the cognitive concept of prototypicality has been invoked. By definition, the most attractive individual face should be the closest to the mathematical average of the population in configuration, and in turn, this prototypical (i.e. average) face should typically be preferred because of its standing as a representative member of the population (Langlois & Roggman, 1990). Such prototype models thus predict that mathematical averageness in a face is considered attractive because of its similarity to the abstracted central tendency that people store as a category representation (Rubenstein et al., 1999; cf. section 1.2.2).

1.1.3 Secondary sexual characteristics

Obvious differences between male and female faces emerge especially during puberty, and include all features related to sexual maturity, most notably the endocrine systems. In males, the rise of testosterone levels stimulates the growth of facial hair, as well as that of the jaw and brow ridges, while estrogen inhibits the growth of these regions in females, resulting in a smaller chin, fuller lips, and high cheekbones. With age, the estrogen concentration in women declines, resulting in increasingly masculinised faces – thus, feminine female faces indicate youth and fertility. Consequently, sexual dimorphism signals the degree of masculinity and femininity, as well as advertising the reproductive potential and heritable traits of an individual (see Little et al., 2011a; Thornhill & Møller, 1997, for reviews).

Darwin (1871) first introduced the idea that male ornamentation plays an important role in mate choice, but was unable to provide an explanation for the female preference. Zahavi (1975) was the first to link such traits to good genes by claiming that secondary sexual characteristics represent an “honest” survival handicap. For instance, a

peacock's colourful tail may be beautiful, but it makes it more visible to predators, as well as making an escape more difficult. Testosterone has also been linked to lower immunocompetence (Folstad & Karter, 1992; Møller, Christe, & Lux, 1999), so only healthy individuals should be able to afford to compromise their immune system and produce larger secondary sexual characteristics. To be consistent with this immunocompetence handicap hypothesis, prominent facial secondary sexual characteristics (masculine traits signalling dominance and immunocompetence in men, and feminine traits signalling youth and fertility in women) should be preferred.

Research linking attractiveness and facial secondary sexual characteristics has however yielded contradicting results. Early studies (e.g. Cunningham, Barbee, & Pike, 1990; Grammer & Thornhill, 1994) reported that female participants preferred masculine traits in male faces, while more recent studies (e.g. Perrett et al., 1998; Rhodes, Hickford, & Jeffery, 2000) found that the opposite is true. Feminine female faces were consistently rated as more attractive, but so were feminine male faces, a result also found in a cross-cultural study (Perrett et al., 1998). However, these findings do not necessarily have to be written off as inconclusive, as further research has shown that the female preference rests on internal factors such as hormone levels (more on these individual differences in section 1.3.1.1).

1.2 Evolution of preferences

What might have shaped these preferences for attractiveness? Given the considerable cross-cultural agreement and the fact that preferences emerge very early in development, our beauty standards may reflect our biological – rather than cultural – heritage. Evolutionary theories assume that these preferences have an adaptive function, and two possible evolutionary mechanisms have been proposed (cf. Rhodes, 2006; Rhodes, Harwood, Yoshikawa, Nishitani, & McLean, 2002). They could either have evolved as an adaptation to the problem of finding a good mate, or they could be by-products of certain information processing mechanisms. These evolutionary mechanisms are however not mutually exclusive, as multiple selection pressures could have shaped these preferences.

1.2.1 Preferences as adaptations for mate choice

Theories of sexual selection are most often cited to explain the mechanisms underlying the early preference for attractive faces. These theories posit that the attractiveness of individuals, be they human or animal, is an indication of their health and thus of their worth as potential mates. In this view, preference for an attractive face would be an adaptation to solve the problem of mate choice: The anatomical complexity of faces makes them susceptible to developmental stress, and other individuals should be sensitive to any resulting deviation from the norm, making it plausible for faces to signal good or bad health (Peterson & Rhodes, 2003; Rhodes, 2006).

Meta-analyses suggest a weak to modest association of attractiveness and mental and physical health (Feingold, 1992; Langlois et al., 2000), and studies have also shown that healthy-looking faces are perceived as attractive (Grammer & Thornhill, 1994; Jones et al., 2001; cf. section 1.1). However, it remains unclear whether this is merely a result of an attractiveness bias, as a strong halo effect causes positive traits to be attributed to attractive individuals. Thus more studies which make use of objective health measures are needed to clear up the link of health and attractiveness. Nevertheless, there is some moderate evidence that preferences are not arbitrary, but may be adaptations for mate choice (cf. Little et al., 2011a; Rhodes, 2006).

1.2.2 Preferences as by-products of information processing

The preference for attractive, average faces could however merely be a by-product of an innate prototype abstraction mechanism. The closer a face is to the prototypical member of a population, the easier it is to process the face on a cognitive level (Langlois & Roggman, 1990). A prototype is defined as "the mathematical average or mean value of the attributes of a category, and represents the averaged members of a class" (Rubenstein et al., 1999, p. 848). Both infants and adults make use of this cognitive ability and are capable of abstracting a prototype after having viewed exemplars of a class of stimuli (Langlois & Roggman, 1990). These facial prototypes are recognised as familiar even when they are novel (Rubenstein et al., 2002), and familiar stimuli evoke more positive reactions and are rated as more attractive (Zajonc, 1968). Conversely, attractive faces are rated as more typical (Rubenstein et al., 2002), making cognitive

averaging a plausible mechanism underlying the preference for attractive faces (Rubenstein et al., 1999). In these accounts, the general prototype formation mechanism is useful in the classification and recognition of objects, and while prototypes are rated as attractive, this attractiveness does not necessarily provide information about mate quality. However, these mechanisms could have contributed to the evolution of a preference for traits which have been shown to be honest indicators of mate quality: Overgeneralisation effects are hypothesised to produce "peak shifts", meaning that extreme examples of a category evoke the stronger responses. The more symmetrical, average, and sexual dimorphic faces would therefore be preferred (Rhodes, 2006).

Prototypicality has also been found to be attractive in a variety of non-western cultures (Pollard, 1995; Rhodes et al., 2001). These findings may appear to be contradictive to the presented averageness hypothesis, but perceptual adaptation suggests that mental representations of a prototype are continuously updated by experience. So while the average face will undoubtedly vary between populations and ethnicities, the postulated perceptual mechanism remains valid (Rhodes, 2006).

1.3 Individual differences

Despite the plethora of studies supporting an apparently biologically ingrained, innate sense of beauty, proverbial wisdom contrarily stresses the importance of individual taste, and suggests that attractiveness standards vary widely across people and cultures. If evidence supporting shared taste is so crushing (cf. section 1.1), how come such phrases have become part of our everyday language?

It is a widely held belief that beauty ideals are culturally unique and, in western nations, often derived from media-induced standards. Even Darwin was stumped by the different beautification practices in indigenous cultures, such as lip enlargement and scarification, and came to the conclusion that "it is certainly not true that there is in the mind of man any universal standard of beauty with respect to the human body" (1871, p. 584). Indeed, when closely analysing the cross-cultural research that claims to find support for universal standards of attractiveness, it is apparent that agreement is significantly lower between cultures that are isolated from one another (Dion, 2002). Thus, while there are certain traits that make faces universally attractive, there are

many other factors that influence the specific type of face one individual finds beautiful. In this section, I review three broad areas which lead to possibly adaptive individual preferences: Internal factors, context, and visual experience (cf. Little et al., 2011a).

1.3.1 Internal factors

As hinted at in section 1.1.3, internal factors can predict individual differences in attractiveness ratings, suggesting an adaptive design in face preferences. These factors can be roughly divided into two types: Those related to hormone levels and fertility, and those related to one's own 'market value', such as indices of own attractiveness.

1.3.1.1 Hormone levels and fertility

Penton-Voak and colleagues (1999) found that female preferences for masculine or feminine facial traits shift with the probability of conception across the menstrual cycle. These variations in preference occur in interaction with the context of the attractiveness judgement, i.e. the mating strategy being pursued (short VS long-term relationship). Negative personality traits such as dominance, coldness, and dishonesty are generally attributed to masculine facial characteristics, while femininity enhances perceived warmth, emotionality, honesty, cooperativeness, and parental qualities. So, while masculine traits indicate good genes, masculine individuals may not possess other personality traits that are desirable in a long-term partner (Perrett et al., 1998).

Indeed, during the follicular phase of the cycle, when the conception-risk is high, masculine male faces were preferred, while more feminine faces were preferred during the lutheal, low-conception-risk phase. Likewise, the preferences for feminine male faces remained constant when judging for a long-term relationship, but there was a significant preference for masculine traits when judging for a short-term-relationship (Penton-Voak et al., 1999), a finding consistent with that of Buss and Schmitt (1993), who found that attractiveness is more important to women when evaluating short-term mates. Similarly, this shift in preference around ovulation is greatest for women who are already in a partnership and are evaluating potential short-term, extra-pair mates (Penton-Voak et al., 1999). This last finding could be an adaptation to increase offspring health: The long-term partner provides paternal investment, while the short-term

partner provides the heritable benefits. Conversely, women on hormonal contraception show a reduced preference for male facial masculinity. It has been hypothesised that this may be due to their changed hormonal profile, which mimics the effects of increased progesterone and thus the low likelihood of conception as it is usually seen during a pregnancy, a time when cooperation and investment is valued more than genetic quality (Little, Burriss, Petrie, Jones, & Roberts, 2013).

These preferences have thus been suggested to be associated with differing, adaptive cost-benefit-considerations on part of the female: While a more masculine individual may have the benefit of good genes, he also confers costs due to potentially reduced investment in the relationship and offspring, a hypothesis supported by the finding that feminine men show a stronger preference for committing to long-term relationships (Boothroyd, Jones, Burt, DeBruine, & Perrett, 2008). Compelling evidence that this shift in preference is tied to reproductively relevant hormones comes from the finding that preferences for masculinity were consistently lower in pre-pubertal and post-menopausal women (Little et al., 2010).

Consequently, it seems that women at a reproductive age switch mating tactics depending on their hormonal cycle, and the desire for good genes may be traded off against other factors, such as the desire for a more cooperative and invested partner.

1.3.1.2 Own attractiveness

Studies report positive correlations between women's own self-rated physical attractiveness and the strength of their preferences for symmetry and masculine traits in male faces (e.g. Little, Burt, Penton-Voak, & Perrett, 2001). This correlation has also been found in studies using more objective measures of attractiveness such as waist-hip-ratio and attractiveness as rated by others (e.g. Penton-Voak et al., 2003). These findings have been proposed to reflect condition-dependent preferences also found in other species, in which attractive (i.e. high mate value) individuals show stronger preferences for likewise attractive mates. This may be adaptive: On the one hand, high quality females are better able to compete for, retain, and replace high quality mates, and on the other hand, lower quality females benefit from avoiding the decreased paternal investment a high quality mate would signify, as it has been shown that there is

a difference in the behaviour of high quality males towards low and high quality mates (Little et al., 2001).

Converging evidence for this hypothesis is provided by the finding that exposure to attractive images of same-sex individuals results in lower self-rated attractiveness and preferences for male masculinity, while exposure to unattractive images had the opposite effect. This suggests that women recalibrate impressions of their 'market value' according to their recent experience with same-sex competition, leading to a recalibration of their mate preferences (Little & Mannion, 2006).

1.3.2 Context

Internal factors can explain some of the individual differences in preferences, but the (social, temporal, and environmental) context under which the attractiveness is rated also contributes to variation.

1.3.2.1 Social context

Humans are able to fairly accurately recognise genetic kinship in strangers' faces (Bressan & Dal Martello, 2002; Kaminski, Dridi, Graff, & Gentaz, 2009), and such judgements of kinship are highly correlated to those of facial similarity (DeBruine et al., 2009). Similarity positively influences prosocial behaviour towards individuals suspected of kinship, such as cooperation (Krupp, DeBruine, & Barclay, 2008) and trust (DeBruine, 2002). Cues of kinship are however detrimental in sexual contexts – self-resemblance is attractive only in own-sex, but not opposite-sex faces (DeBruine, 2004), an adaptive preference which has most likely evolved to avoid inbreeding while promoting prosocial behaviour towards own-sex kin (Little et al., 2011a).

Further research yielded consistent evidence to the context-sensitivity of responses to self-resemblance: Facial resemblance in opposite-sex faces increased perceived trustworthiness (i.e. prosocial context), decreased attractiveness for short-term relationships (i.e. sexual context), while having no effect on attractiveness for long-term relationships (i.e. both prosocial and sexual context) (DeBruine, 2005). This context-sensitivity shows that it makes a difference whether attractiveness is judged for potential mates or for potential cooperative partners.

1.3.2.2 Temporal context

Temporal context influences the relative importance of the benefits and costs associated with male masculinity, and thus female preferences for a masculine partner shifts depending on whether the male is a potential short or long-term mate (cf. section 1.3.1.1). The costs of low paternal investment are greater in a long-term relationship, which is why women show a greater preference for feminine men with gentle features when judging potential long-term mates, while masculine men are preferred when judging for a short-term partnership (Little, Jones, Penton-Voak, Burt, & Perrett, 2002; Penton-Voak et al., 1999).

Since women generally prefer masculine partners in the fertile phase of their cycle, this preference shift may be adaptive to maximise good genes benefits. In a long-term relationship, parental investment and cooperation are of greater importance, which would explain the shift to feminine traits (Little et al., 2002). Penton-Voak and colleagues (2003) found that this pattern is exaggerated in less attractive women. The explanation given by the authors is that since attractive women are better able to attract, retain, or replace high quality (i.e. masculine) partners, they do not exhibit such a large shift in preference between short and long-term partners, while less attractive women would profit from shifting mate strategies due to the trade-off of good genes and cooperative traits.

1.3.2.3 Environmental context

The trade-off hypothesis of female preferences also postulates that women in harsh environments (i.e. environments high in pathogen load and inaccessible or poor health care) should show stronger preferences for cues of health (Gangestad & Simpson, 2000; Little et al., 2001, 2002; Penton-Voak et al., 1999; Perrett et al., 1998; Thornhill & Gangestad, 1999). Data from 29 cultures yielded that pathogen prevalence is positively correlated to the value put on a mate's physical attractiveness and health (Gangestad & Buss, 1993). In a more recent study, World Health Organization (WHO) statistics from 30 countries were used to compute a 'national health index' (NHI), which was negatively correlated with women's average preference for masculinity for each country, a relationship that remained significant even when controlling for variations in wealth and mating strategies (DeBruine, Jones, Crawford, Welling, & Little, 2010).

Similarly, face preferences are also influenced by the availability of resources in an environment. In low-resource environments, a preference for an investing partner may be the best adaptive strategy due to the difficulty of acquiring resources for offspring survival. Opting for a mate with good genes may be the better tactic in high-resource environments, as the added effort of a second invested parent would be of little gain. Little, Cohen, Jones and Belsky (2007) tested these hypotheses and found that both sexes decrease their preference for high quality mates for long-term relationships in the context of a harsh environment, a finding consistent with the ideas postulated by the trade-off theory.

1.3.3 Visual experience

The effects of facial qualities that usually increase preference for most perceivers can be moderated or eliminated by an individual's learning history. An individual's visual experience helps in shaping personal preferences, either through exposure or by observing the choices of others, resulting in cultural and individual differences (Little et al., 2011a; Zebrowitz & Rhodes, 2002).

1.3.3.1 Exposure

Facial preferences may be influenced by people's different learning history, i.e. faces they are or have been exposed to. For example, people develop a preference for things merely because they are familiar with them, even when the exposure was unconscious (Zajonc, 1968, 2001), making familiarity a powerful determinant of attractiveness. The mere-exposure-effect alone cannot however explain the full increase in preference – positive associations (i.e. positive past experiences) have been found to lead to increased attraction, while negative associations decrease it, an effect which generalises to novel, physically similar individuals (Jones, DeBruine, Little, & Feinberg, 2007). This may be better explained with the identity overgeneralisation effect, which causes people to prefer faces that resemble those of their significant others (Zebrowitz, 1997).

There is increasing evidence of imprinting in humans, i.e. attraction to parental traits, though the effect appears to be dependent on the quality of the relationship

(Bereczkei, Gyuris, & Weisfeld, 2004) to mainly the opposite-sex parent (Little, Penton-Voak, Burt, & Perrett, 2003). For instance, individuals are attracted to mates similar in age to their parents' age when they were born (Perrett et al., 2002). There is a significant facial resemblance between a wife and mother-in-law (Bereczkei, Gyuris, Koves, & Bernath, 2002) and a daughter's husband and her adoptive father (Bereczkei et al., 2004), and the best predictor for partner traits are the opposite-sex parent's hair and eye colour (Little et al., 2003). Imprinting-like effects in humans thus appear to be more complex than simple exposure to parents as observed in the animal world. They are directed more towards one parent than towards the other, and they are dependent on the relationship with that parent (Little et al., 2011a).

Familiarity and imprinting both propose that exposure to certain faces positively affects perceived attractiveness, but exposure also has an effect on the cognitive representation of faces. This average face representation is calculated from (and constantly updated by) experience (cf. section 1.2.2), resulting in different populations finding different faces more attractive. So while prototypical faces of every ethnicity are generally preferred, the preference is significantly stronger within a congruent population, i.e. people show a preference for features typical of their own race [*sic!*] (Wagatsuma & Kleinke, 1979). This further suggests that attractiveness cues are learned from visual exposure (Perrett et al., 1998). A generalisation effect has also been found in the context of prototype formation: Subsequent perceptions of novel faces similar to those initially viewed (even when distorted in their traits) are perceived as more prototypical and attractive (Rhodes, Jeffery, Watson, Clifford, & Nakayama, 2003), suggesting that face norms can be updated and recalibrated very rapidly.

1.3.3.2 Social learning

Since humans are highly social, a social learning of preference on top of simple experience seems very likely, and social learning may also influence mate preferences. Mimicking others could be adaptive if it allows assessing potential mates more efficiently than through individual trial and error (Little et al., 2011a; Little et al., 2011b). For instance, women rate men as more desirable when they are shown surrounded by women as opposed to being shown alone or with other men (Hill & Buss,

2008), and images of men labelled as married were rated as more attractive than those labelled as single (Eva & Wood, 2006).

The attitude of other women influences preferences as well: Pictures of men that had previously been seen paired with images of women looking at them with a smiling rather than a neutral expression were preferred (Jones, DeBruine, Little, Burriss, & Feinberg, 2007). It was an early finding that positive characteristics are attributed more frequently to men who are paired with attractive women (Sigall & Landy, 1973), indicating that the attractiveness of the partner is used to judge the man's own. These effects have been shown to be more pronounced when judging the potential for long-term relationships (Little, Burriss, Jones, DeBruine, & Caldwell, 2008), suggesting that social information is being used to infer non-physical traits that are valued in long-term partners, such as resources or intelligence, which are otherwise difficult to determine based on physical appearance alone (Little et al., 2011a).

1.4 Summary of past research

In this chapter, we have established that attractiveness has significant social consequences, and that what is and is not attractive appears to be ingrained in our biological heritage. We have seen that there is an abundance of empirical evidence showing that symmetry, averageness, and sexual dimorphism are attractive in both sexes and across cultures. These attractive traits are believed to signal good genes and health – important aspects of mate quality – but we have also seen that the way our brain processes information shapes our preferences as well.

However, while some aspects may be innate, experience also has a clear influence on taste, and may cause adaptive individual differences within and across cultures. The Multiple Fitness Model (Cunningham et al., 1995; Cunningham, Barbee, & Philhower, 2002) states that attractiveness varies across multiple dimensions that go beyond the three broad areas described above, such as expressive and grooming features, among others. Each of these features is believed to represent a different aspect of mate value, and while the attractiveness of some features appears to be universal, specific ecological and individual variables may influence the preference for some attributes more than

others, therefore stressing the variability of the importance placed on certain dimensions (due to hormonal fluctuations, but also personality and mood).

Clearly, various selection pressures during our evolutionary history, individual learning histories, and personal social goals interact and combine to shape personal taste in facial preferences (Zebrowitz & Rhodes, 2002). Research regarding this private taste component of perceived attractiveness is scarce, yet the few existing studies indicate that shared taste accounts for only about 50 percent of variance in attractiveness ratings (Hönekopp, 2006; Lucker, Beane, & Guire, 1981). Most recently Hönekopp (2006) argued that the findings so far do not explain the extent to which private and shared taste contribute to perceived attractiveness because averaging across ratings can only inaccurately reflect the preference of the individual raters. Since the main objective of the present thesis is largely derived from Hönekopp's study, in the following section I take a closer look at the ideas and methods proposed in his paper.

1.5 Hönekopp's 2006 study

In his 2006 paper "Once more: Is beauty in the eye of the beholder? Relative contributions of private and shared taste to judgements of facial attractiveness", Johannes Hönekopp argues that the majority of past research on facial attractiveness has misconstrued the importance of shared attractiveness standards. Hönekopp defines *shared taste* as "subsuming all attractiveness standards that let, on average, two judges agree to some extent about the attractiveness of faces", while defining *private taste* as "subsuming all attractiveness standards of a single judge that give rise to replicable disagreement with shared taste" (p. 199).

1.5.1 Shortcomings of the standard research paradigm

The bulk of past research on facial attractiveness shares the same simple paradigm: Each judge rates each face. Face scores (each stimulus' average rating), which reflect the shared taste of the rater sample, are calculated, and the relationships between these scores and facial properties are examined. According to Hönekopp, such a stimulus-centred approach gives rise to misinterpretations, since conclusions are largely

based on high Cronbach's alpha reliability coefficients for these face scores, which in turn serve as an estimate of the population average. In short, the higher Cronbach's alpha, the higher the expected correlation between the obtained face scores and the actual average evaluations in the population. This simple paradigm treats each judge as an item in a test that sets out to measure the average attractiveness judgement for each face; evaluations averaged across judges are usually highly reliable. Therefore, the standard paradigm is – according to Hönekopp – insufficient to unravel the relative impact of shared and private taste because it overestimates the influence of shared taste. By averaging across all judges, the preference of the individual is treated as noise and is dismissed.

1.5.2 A new statistical approach

Hönekopp suggests an alternative method of analysis that allows reporting for how many raters a proposed relationship between a facial property and attractiveness judgements was obtained. Generalizability theory (Shavelson & Webb, 1991; Brennan, 2001) provides a suitable statistical framework to measure the relative influence of private and shared taste on attractiveness ratings by estimating variance components.

By having each judge rate all faces more than once, estimating the relative impact of private and shared taste from these variance components becomes possible. The more raters agree, the more variance is attributable to the faces, and consequently the greater the influence of shared taste can be considered to be. To determine the impact of private taste on attractiveness judgements, a repeated rating is necessary in order to separate the interaction between stimuli and raters from error. Therefore, following Hönekopp's reasoning, shared taste is reflected in the variance component for faces ($varcomp_{F}$), while the variance component for the interaction between faces and judges ($varcomp_{JxF}$) reflects private taste.

It is however unclear if the variance component for judges ($varcomp_{J}$) reflects private taste. A difference between one judge's score and the average judge score could either simply reflect a meaningless difference in scale use, or it may reflect important differences in perception and behaviour. In the former case, differences between individual judge scores and the mean judge score can be neglected because the

differences have no bearing on the relative impact of private and shared taste. However, under the latter assumption, the rating differences may reflect genuine and important disagreement with the average taste. Since there is no definite answer to this question, Hönekopp settles for reporting results from both perspectives.

To most concisely describe the relative impact of shared and private taste, Hönekopp proposes a beholder index (*bi*), which he defines as

$$\frac{variance_{\mathrm{pt}}}{variance_{\mathrm{pt}} + variance_{\mathrm{st}}}$$

with $variance_{\mathrm{pt}}$ denoting the variance attributable to private taste, and $variance_{\mathrm{st}}$ denoting the variance attributable to shared taste. Resting on the assumption that judge-score differences are meaningless, bi_1 is computed as

$$\frac{varcomp_{\mathrm{JxF}}}{varcomp_{\mathrm{JxF}} + varcomp_{\mathrm{F}}}$$

When assuming that judge-score differences are meaningful, bi_2 computes as

$$\frac{varcomp_{\mathrm{JxF}} + varcomp_{\mathrm{J}}}{varcomp_{\mathrm{JxF}} + varcomp_{\mathrm{F}} + varcomp_{\mathrm{J}}}$$

For both indices, $varcomp_{\mathrm{JxF}}$ denotes the estimated variance component attributable to the interaction between judges and faces, and $varcomp_{\mathrm{F}}$ and $varcomp_{\mathrm{J}}$ the estimated variance components for faces and judges, respectively. Thus, "a *bi* of .20 would indicate that 20% of the meaningful variance stable across time arises from private taste, and 80% arises from shared taste" (p. 202).

1.5.3 Method

Hönekopp's study consisted of three experiments which varied in (judges and faces) sample composition, but not in their experimental design. Hence, in the interest of brevity, only the first study will be presented in depth, but the results of all three experiments are reported.

Willing persons – approached at different educational sites in Münster, Germany – were photographed with neutral facial expressions, facing the camera frontally. Eyeglasses were removed and men were beardless (though not required to be clean-

shaven). These pictures were then cropped to show the entire head down to the upper cervical fold and scaled down to 537 pixels to be used as stimulus material. Participants rating the stimuli for attractiveness were not familiar with the photographed persons.

In a first randomised presentation series, each face was shown for two seconds "to allow the judges to establish a stable internal standard for scale use" (p. 203). In a second series, the faces were shown for five seconds (in the same order as during the presentation series) – only during this second series were the faces rated on a 7-point scale ranging from *not attractive* (1) to *very attractive* (7). One week later, judges participated in a second rating session with the same procedure as the first session.

1.5.4 Results

Experiment 1 yielded results suggesting that private and shared taste accounted for about the same amount of meaningful variance stable over time.

Experiments 2 and 3 followed the same procedure, but used more heterogeneous samples in regards to race [*sic*] and sex of both models and judges, following the basic assumption that more heterogeneous samples should allow private taste to exert a greater influence. This was hardly the case, and while the *bi*s rose slightly in the latter two experiments, all three provided similar results: Private and shared taste are of about equal importance.

2 Art appreciation

"All art is quite useless"; thus ends the preface in Oscar Wilde's controversial novel "The Picture of Dorian Gray" (1890, p. 2). Yet art is universal: Although a variety of explanations for its emergence have been proposed (Dissanayake, 2007), it is a uniquely human endeavour and exists in all cultures; the oldest art objects date back over 100,000 years (Vanhaeren et al., 2006), and the oldest cave paintings have been estimated to be at least 40,000 years old (Pike et al., 2012). The point Wilde was trying to make was that art, on its own, has no value, but is instead given importance because of how it affects us. Art is a reflection of the artist, and we like to look at it because we see something of ourselves reflected back. In this way, art production and appreciation are defining attributes unique to human experience.

It is a widely held belief that art, in terms of both production and appreciation, is not typically governed by rules, and aesthetic preferences are consequently often assumed to be unpredictable (Lindell, & Mueller, 2011). This may explain why, despite aesthetics research dating back well over a century, psychology has never paid as much attention to the visual arts as one would expect, focusing instead on general aesthetic problems (Silvia, 2005). Attempts to find general laws which help in understanding the development of aesthetic preferences have been made since the very beginning of experimental psychology, marked by Fechner's pivotal work (1876). Since then, a variety of factors have been proposed to affect aesthetic judgements, such as complexity (e.g. Berlyne, 1970; Chen, Wu, & Wu, 2011; Eisenman & Gellens, 1968; Tinio & Leder, 2009), symmetry (e.g. Eisenman & Gellens, 1968; Tinio & Leder, 2009), novelty (e.g. Berlyne, 1970), typicality, and meaningfulness (Martindale, Moore, & Borkum, 1990). The majority of empirical studies and theories in the field of aesthetics try to identify common visual properties that determine preferences in a group of observers, while ignoring internal factors. However, averaging across raters has the same shortcomings that the approach entails when investigating facial attractiveness (which is of course a highly specific sub-domain of visual preference; cf. section 1.4-1.5). When group norms are stressed over personal taste, the influence internal factors may have on visual preferences is disregarded, yet it's important to remember that "while images may contain certain features that activate a core of common experience shared by all

observers, they also engender unique associations for every individual leading to divergent tastes" (Vessel & Rubin, 2010, p. 4).

Several models that attempt to explain aesthetic experience from both a nomothetic and ideographic approach have been proposed recently (e.g. Leder, Belke, Oeberst, & Augustin, 2004; Lindell & Mueller, 2011). In an influential paper, Leder and colleagues (2004) presented a model which describes aesthetic experience as a complex cognitive process consisting of five perceptual and interpretative processing stages that ultimately lead to the formation of aesthetic emotion and judgements. It is important to note that the model is not meant to be taken as a strict hierarchy – processes can potentially fall back on previous stages forming feedback-loops. Additionally, these cognitive-processing stages are accompanied by a continuous development of changes in the affective state of the observer.

An artwork, especially when modern or contemporary, often requires contextual cues such as being housed in a museum to be classified as art. The first stage proposed in the model is that of *perceptual analyses*, which involves the quick and automatic exploration of stimulus features such as complexity, contrast, symmetry, colour, order, and grouping. The next stage, *implicit memory integration*, takes previous experience into account by automatically classifying for perceived familiarity and prototypicality, while the third stage, *explicit classification*, is deliberate and affected by the actual expertise and knowledge of the observer. On this level, analyses are concerned with content and style, but also with individual factors such as personal taste and interest, allowing new stimuli to be classified thanks to a generalisation of previous knowledge. The last two stages, *cognitive mastering* and *evaluation*, are closely linked in a feedback-loop, with the results of the former being constantly evaluated with regard to its success until a satisfactory interpretation is reached. Full understanding most likely cannot be achieved, since ambiguity is an art-inherent feature that does not need to (and often cannot) be completely resolved. The successful interpretation of an artwork is supposed to positively affect the rewarding centres of the brain, providing a self-rewarding cognitive experience (Kawabata & Zeki, 2004; Ramachandran & Hirstein, 1999; Vartanian & Goel, 2004). According to the model, these processes result in two independent outputs: *Aesthetic emotion*, an emotional reaction which is a by-product of the information processing stages, and *aesthetic judgement*, the result of the evaluation

and cognitive mastering stages. The authors hypothesise for art novices to show a stronger interdependence of the two outputs, while experts should be better able to evaluate the two independently.

Experimental research pursuing an ideographic approach to art appreciation is both a recent and scarce occurrence. Jacobsen and Höfel (2002) supplied the first study examining both the generality of group principles as well as individual differences: The stimuli used were especially constructed graphic patterns which only differed on the dimensions *symmetry* and *complexity*. They found that despite symmetry being the highest and complexity the second highest correlate of judgements of beauty (meaning agreement on the group level and thus support for shared taste), there were substantial individual differences: Some participants used these cues in a negative manner or based their ratings on other cues entirely (such as a certain geometrical shape). Again, averaging across raters only inaccurately reflected the preference of certain individuals. Another study using actual artworks as stimuli is that of Vessel and Rubin (2010), in which the authors hypothesised that shared preferences may be driven by shared semantic interpretations. These shared preferences would consequently be the result of shared experiences with a stimulus, and not of the stimulus features themselves. The study yielded that abstract images showed a significantly lower agreement across observers than real-world images, a finding consistent with their main hypothesis: Shared semantic associations lead to similar assessments of meaning, and therefore to similar responses. Analogous associations are not available for abstract images since they lack, per their definition, semantic content, making effects of style particularly dominant in abstract art.

2.1 Abstract art

The new, experimental approach to art in the 20th century has resulted in a dominance of style over content, and an artist's success has mainly been due to a unique and distinctive artistic style. Abstract art is a relatively new 'invention', with artists like Kandinsky and Malevich paving the way about a century ago. To this day, abstract artworks are the only objects which can be differentiated only by their style of depiction rather than their content; conceptual ideas, and stylistic reflections and variations are

no longer readily apparent, and the visual properties early aesthetics research focused on hardly apply (Leder et al., 2004), making meaning extraction a greater challenge (Belke, Leder, & Augustin, 2006). To the present day, abstract art is still not commonly appreciated or even understood, and the popular distaste for it is believed to be a direct consequence of its lack of semantic meaning. Research has in fact shown that laypeople tend to dislike abstract art due to its ambiguous nature (Landau, Greenberg, Solomon, Pyszczynski, & Martens, 2006), which leaves them wondering what a work is supposed to mean. Abstract art does not contain any images that can be contextualised, but relies purely on colour, composition and shapes. While some people may appreciate this ambiguity and open-endedness (cf. section 2.2.1-2.2.2), most find it an obstacle to fully enjoying a painting.

Abstract images are not only generally disliked, they also yield low observer agreement in preferences (Vessel & Rubin, 2010), probably due to their larger need and openness for interpretation (Leder et al., 2004). If shared semantic interpretations lead to shared preferences (Vessel & Rubin, 2010), but abstract artworks lack, per their definition, any semantic content – where does it leave us on the shared taste account? What other factors may influence a preference for abstract images?

2.1.1 Expertise

Art education and interest play an important role in aesthetic preferences. For instance, the frequency of visits to art galleries and art expertise are predictive of higher liking for the visual arts (Furnham and Walker, 2001). Art expertise influences the way artworks are perceived, analysed, and interacted with (Leder et al., 2004; Leder, Gerger, Dressler, & Schabmann, 2012; Kozbelt & Seeley, 2007; Ramachandran & Hirstein, 1999; Silvia, 2007), and since aesthetic appreciation of abstract art is hypothesised to strongly depend on aspects of cognitive mastering (Leder et al., 2004), higher expertise should also come with greater appreciation of art.

In the model of aesthetic experience proposed by Leder and colleagues (2004), the authors posit that experts process art differently to laypeople from the earliest stages. For instance, they may classify prototypical artworks in respect to artist or style, while laypeople do not have the intrinsic knowledge for such a classification. In the stage

of *explicit classification*, the point at which viewers are able to name what they see in an artwork, experts are generally believed to classify paintings more with respect to style, while laypeople presumably concentrate more on depicted content and its degree of realism, which further explains the general dislike for abstract art found in non-experts. During the subsequent phase of *cognitive mastering*, which involves higher-order interpretations, experts are presumed to interpret artworks on the basis of art-specific concepts, while laypeople probably draw upon their personal experiences and everyday knowledge. Interest and expertise are therefore central variables determining an aesthetic experience, even more so in abstract art, where the understanding no longer comes from stimulus features, but rather from top-down influences. The authors conclude that the more expertise a perceiver acquires, the more differentiated and probably more rewarding the aesthetic experiences will be. This is in accordance with the "effort after meaning" theory, which states that part of the pleasure derived from looking at a painting stems from the feeling of having successfully grasped the artist's message (Russell, 2003).

A recent study by Leder and colleagues (2012) yielded converging evidence insofar as that experts not only liked all types of art more than non-experts did, but they also found the paintings more understandable and emotional, a finding which suggests that a general effect of expertise does indeed exist. Most importantly, comprehension and liking appear to be linked: Experts are able to assign meaning to all kinds of artworks, regardless of the level of abstraction, and thus show higher appreciation for abstract paintings compared to laypeople. Further support for this theory comes from the finding that providing art novices with additional stylistic information causes both understanding and appreciation for abstract paintings to increase (Belke et al., 2006).

2.1.2 Personality

Individual personality traits have been shown to be related to aesthetic experience and preference for certain types of art (see Gridley, 2013, for a review). For abstract art, *Sensation Seeking*, *Openness to Experience*, and *Neuroticism* have been shown to be predictive of positive ratings (Feist & Brady, 2004; Furnham & Walker, 2001), while conservativism (Wilson, Ausman, & Mathews, 1973) and field dependence (Tobacyk, Myers, & Bailey, 1981) are negatively correlated with the liking of abstract art.

In short, "abstract art is preferred over representational art among individuals who enjoy novelty, ambiguity, and dissonance and are particularly sensation seeking, open-minded, field-independent thinkers" (Gridley, 2013, p. 463).

2.1.2.1 Sensation Seeking

The construct *Sensation Seeking* (SS) was first developed in the 1960s to quantify an "optimal level of stimulation" (Zuckerman, Kolin, Price, & Zoob, 1964). It is defined as the seeking of "varied, novel, complex, and intense sensations and experiences, and the willingness to take physical, social, legal, and financial risks for the sake of such experience" (Zuckerman, 1994, as cited in Zuckerman, 2009, p. 455). While risk is not an essential part of the trait, it is "often ignored, minimized, or tolerated and may even increase positive arousal to the activities that are risky" (Zuckerman, 2009, p.455). The sensation seeking scale (SSS) developed by Zuckerman and colleagues (1964) consists of four subscales: *Thrill and Adventure Seeking* (TAS) describes the desire to engage in activities involving speed and danger; *Disinhibition* (Dis) describes the seeking of intense social and sexual experiences; *Experience Seeking* (ES) is defined by the desire for novel experiences through travel, art, people, and a non-conforming lifestyle; *Boredom Susceptibility* (BS) involves the aversion to repetition and routine as well as restlessness when exposed to such conditions.

SS is negatively correlated with field dependence, and has since been shown to be the best personality predictor for art preference (Furnham & Walker, 2001). The research group around Zuckerman found a relationship between high SS and a preference for high tension, expressionist, and semi-abstract paintings, as well as a generally higher tolerance for ambiguity (Zuckerman, Ulrich, & McLaughlin, 1993). Later studies found a positive correlation between high total SS scores and a preference for novel and complex designs as well as for abstract art (Furnham & Bunyan, 1988; Furnham & Walker, 2001; Tobacyk et al., 1981; Zuckerman, 2009).

2.1.2.2 Openness to Experience

Openness to Experience is one of the dimensions in the Big Five Personality Model, and describes the active seeking and appreciation of experiences for their own sake.

Openness to Experience has a significant positive correlation with *Sensation Seeking* (and in particular with the *Experience Seeking* facet), but can still be considered an independent personality factor since most of the trait variance cannot be explained by their overlap (García, Aluja, García, & Cuevas, 2005).

In the Revised NEO Personality Inventory (NEO-PI-R; German version by Ostendorf & Angleitner, 2004), the trait consists of six highly correlated facets: *Fantasy*, which describes active imagination; *Aesthetics*, the appreciation of art and beauty; *Feelings*, an attentiveness to inner emotions; *Actions*, the openness to new experiences; *Ideas*, intellectual curiosity; and *Values*, which comprises the readiness to re-examine own values and those of authority figures. Individuals high in *Openness to Experience* tend to be more curious, imaginative, open-minded, and creative than those who score low on the scale (McCrae, 1987). The construct predicts a general liking for all types of visual art (Furnham & Walker, 2001), and has even been linked to artistic creativity, as professional artists have been found to score higher than members of the general population (Feist, 1998).

3 Deriving the present research questions

The main objective of the present thesis is to study the relative contribution of shared and private taste, in dependence on different classes of objects. I compare the effects on perceived facial attractiveness on one hand, and on the appreciation of abstract artworks on the other hand. While the methodology used is based on Hönekopp's 2006 study (cf. section 1.5), the main difference lies in the manipulation: While Hönekopp merely instructed his participants to rate for attractiveness and went on to estimate variance components from these judgements, my approach is to split the participants into two "extreme groups" first. Specifically, by randomly splitting participants into a shared and a private taste group differing in their task instruction, I hope to elicit responses (more or less) congruent with shared or private taste, respectively, and thus get a better understanding of whether the relative influence of the two can be manipulated. To my knowledge, this is the first time that such a manipulation has been employed, and the goal is to see whether the relative influence of private and shared taste can be influenced by instructing the participants a certain way (see Appendix III for the exact instructions used). If it is indeed possible to wilfully adopt either a more private or a shared taste perspective, future aesthetics research will have to take this into account when instructing participants.

Since the two conditions (facial attractiveness and abstract art appreciation) are separate research questions not meant to be compared with one another, they are presented independently.

3.1 Facial attractiveness

Most studies on facial attractiveness simply ask participants to rate for 'attractiveness' without providing a definition of the term, thus assuming that people share a common understanding of the task (Rhodes, 2006). For heterosexual participants, such attractiveness judgements can be assumed to reflect the sexual attractiveness for opposite-sex faces, as responses correlate almost perfectly with desirability for a date (0.97) or marriage (0.93) (Cunningham et al., 1990). Given these findings, we will restrict the faces used in the present study to male faces aged

approximately 18-30, while the participants will be heterosexual female undergraduates of the same age range.

The data gathered in three experiments led Hönekopp (2006) to conclude that sample composition does not exert a significant influence on *bi*. However, a re-analysis yielded the finding that the homo- or heterogeneity of the face sample can radically affect the variance component for faces and yield extreme values for *bi*. He therefore stresses the importance of an ecologically valid face sample, i.e. the faces should reflect an adequate attractiveness spectrum and the age at which mate search occurs. Still, he further notes that a universal answer of just how much beauty lies in the eye of the beholder cannot be given, as it heavily depends on the face sample used. We consequently split the face sample used in the main study in a low- and high-attractiveness group by the median in order to ensure a better distribution on the attractiveness spectrum. For each group, the stimuli with the largest mean *SD*s were selected for the main study due to Hönekopp's finding that homogenous samples cause *bi* to inflate.

In line with past research, I expect the reliability of face scores to be high regardless of the manipulation undergone (private or shared taste instruction). However, provided the manipulation is successful, inter-judge agreement should be higher in the shared taste group, while *bi* should be lower, as it expresses the amount of meaningful variance explained by private taste influences. By recalling how *bi* is computed, the variance component for faces ($varcomp_F$, indicative of shared taste) should increase in the shared taste group, while the variance component for the interaction of judge and face ($varcomp_{JxF}$, indicative of private taste) should decrease, with the opposite being the case in the private taste group.

3.2 Abstract art appreciation

Hönekopp's method has not been applied to the visual arts yet, which is why this second focus is rather exploratory in nature. Nevertheless, in line with past research regarding abstract art appreciation in non-experts, I expect inter-judge agreement to be low in both groups, a direct consequence of the lack of semantic meaning inherent to this type of art. Additionally, I argue that since abstract art is void of meaningful content,

it should grant greater opportunities for subjective interpretation, and any individual differences in liking cannot be due to a preference or dislike for a specific semantic meaning. I therefore hypothesise that *bi* will be rather high (with private taste explaining more meaningful variance than shared taste) in both groups, with the variance component for the judge and artwork interaction ($varcomp_{JxA}$) explaining the most meaningful variance in both cases.

Of course, the opposite could be the case: Folk psychology often assumes abstract art to be an expression of the artists' emotions, and with abstract art being self-referential, viewers may all be share the same emotional interpretation and thus provide similar ratings. However, considering the bulk of research regarding laypeople's liking (or lack thereof) of abstract art, I find the first hypothesis presented to be more likely, and expect low inter-rater agreement and high values for *bi*.

As expertise and certain personality traits have been shown to be important predictors of successful interpretation and appreciation of abstract art, participants will additionally fill out an internally developed questionnaire on art interest and expertise, as well as the Sensation Seeking Scale (SSS-V; Beauducel, Strobel, & Brocke, 2003) and items related to *Openness to Experience* taken from the NEO-PI-R (Ostendorf & Angleitner, 2004).

4 Method

4.1 Participants

A total of 107 female participants rated all faces for attractiveness and all artworks for liking in two sessions scheduled one week apart. The larger portion of the sample consisted of undergraduate psychology students at the University of Vienna, who fulfilled curriculum requirements or earned extra credit by participating. Twelve participants had to be excluded because they either did not attend the second session or turned out to be familiar with some of the stimuli from previous studies. The 95 remaining participants ranged in age from 19-33 years (M = 22.7, SD = 2.9).

4.2 Stimuli

The selection of 100 facial and 100 abstract art stimuli was based on two preliminary studies, which I describe separately in the following sections.

4.2.1 Preliminary study 1 (Faces)

4.2.1.1 Participants

Thirty-eight female participants rated all stimuli for attractiveness. The raters were psychology undergraduates at the University of Vienna, received partial course credit for their participation, and ranged in age from 18-29 years (M = 21.6, SD = 2.2).

4.2.1.2 Stimuli

A total of 143 pictures of male Caucasian faces were used. 80 faces were taken from two databases (Langner et al., 2010; Schacht, Werheid, & Sommer, 2008), and 63 others were additionally selected from the internet (by use of the search engine *Google*) to match the existing stimuli as closely as possible. All models depicted were aged approximately 18-30 years, posed with a neutral expression and faced the camera frontally. In accordance with Hönekopp's study, all pictures were scaled down to a

height of 537 pixels (equalling a width of 413 pixels). Where applicable, blemishes, clothing, jewellery, and tattoos were removed, the brightness adjusted, and the background altered to a uniform light grey background to match across all stimuli. All alterations were made using Photoshop CS2 (Version 9.0).

4.2.1.3 Procedure

Participants were told that the aim of the experiment was a pre-rating of stimuli to be used in a further study. Because the stimuli were taken from three different sources, the importance of rating the stimuli by the depicted face and not by the image quality was stressed in the instruction. The target faces were shown in randomised order without time restriction, accompanied by a 7-point Likert-scale.

4.2.1.4 Selection process

Mean attractiveness scores and mean standard deviations were calculated for each stimulus. The faces were then split in a low- and high-attractiveness group by the median (2.6035), and for each group, the 50 stimuli with the largest mean *SD*s were selected for the main study (cf. section 3.1). Examples for the final facial stimulus material used in the main study are shown in figure 1.

Figure 1. *Examples from the final selection of facial stimuli for low (left), average (middle) and high (right) attractiveness.*

4.2.2 Preliminary study 2 (Abstract art)

4.2.2.1 Participants

Twenty-seven participants (17 female, 10 male) rated all artworks for liking. As in prestudy 1, all participants were undergraduate students at the University of Vienna, received partial course credit for their participation, and ranged in age from 19-29 years (M = 22.2, SD = 2.7).

4.2.2.2 Stimuli

125 abstract paintings (61 with positive, and 64 with negative valence) were mainly chosen from art-databases such as Prometheus and Saatchi. *Valence*, as defined by Frijda (1986, p. 207), describes the intrinsic attractiveness (positive valence) or aversiveness (negative valence) of an object. The images were resized so that the longer side equalled 700 pixels while keeping the original proportions. Although some popular artists such as Kandinsky, Klee, and Pollock were included, the chosen artworks are not considered to be well-known among laypeople.

4.2.2.3 Procedure

Participants were told that the aim of the experiment was a pre-rating of stimuli to be used in a further study. The 125 target artworks were shown in randomised order without time restriction, accompanied by a 7-point Likert-scale.

4.2.2.4 Selection process

One of the participants was excluded from further analysis due to her self-reported art-expertise, and one artwork had to be excluded due to a programming error. As in prestudy 1, mean attractiveness scores and the respective mean standard deviations for each stimulus were calculated. Some stimuli were consequently excluded from further analyses due to their resolution and picture quality being too low for the standards agreed upon for the main study. The artworks were then split in low- and high-liking groups for both positive and negative valence artworks by the median

(3.6154 for negative valence, 3.0385 for positive valence), and for each group, the 25 stimuli with the largest *SD*s were selected for the main study. Examples for the final abstract artworks used in the main study are shown in figure 2 (negative valence) and figure 3 (positive valence), respectively.

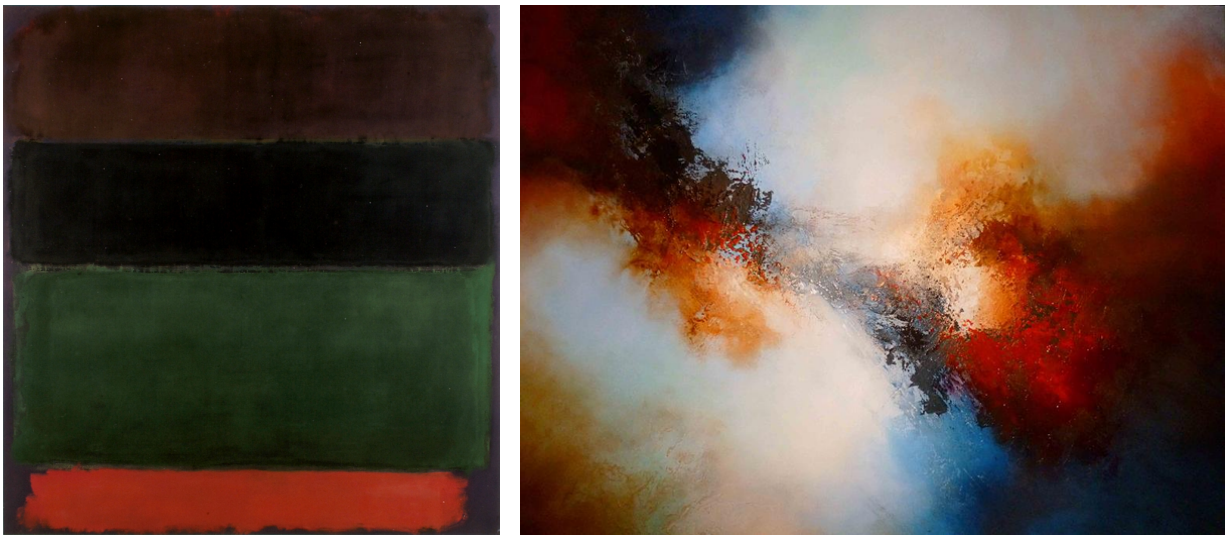

Figure 2. *Examples from the final selection of abstract artworks with negative valence for low (left) and high (right) liking.*

Figure 3. *Examples from the final selection of abstract artworks with positive valence for low (left) and high (right) liking.*

4.3 Procedure

The experiments were carried out at the psychology institute building, in a testing room lit mostly by artificial light. After giving written consent, each participant

was subject to a short visual acuity test as well as a screening for colour vision deficiency by using Ishihara's Colour Plates Test. The experiment was controlled by the E-Prime application, with the stimuli appearing on the screens of Samsung S24C450 monitors (resolution 1920x1200px, 32 Bit colours, 60 Hertz), against a uniform white background.

The main difference to Hönekopp's method lies in an additional manipulation: Participants were randomly split in a private or shared taste group differing in their task instruction. In the private taste group, participants were instructed to rate the attractiveness of the faces and the beauty of the artworks in accordance with their own, individual taste, while the shared group instruction stressed the importance of providing judgements from the perspective of others.

Every participant rated both stimulus categories (faces and artworks), which were presented in balanced order. The further procedure was identical to Hönekopp's: In a first randomised presentation series, each face or work of art was shown for two seconds to allow the participants to form an internal standard for scale use, and in a second rating series, the faces or artworks were shown for five seconds and rated on a 7-point Likert-scale. A crosshairs was shown for 5 seconds between every stimulus during the rating series. See Appendix III for the exact wording of all instructions and rating scales, and figure 4 for a schematic representation of the experimental procedure.

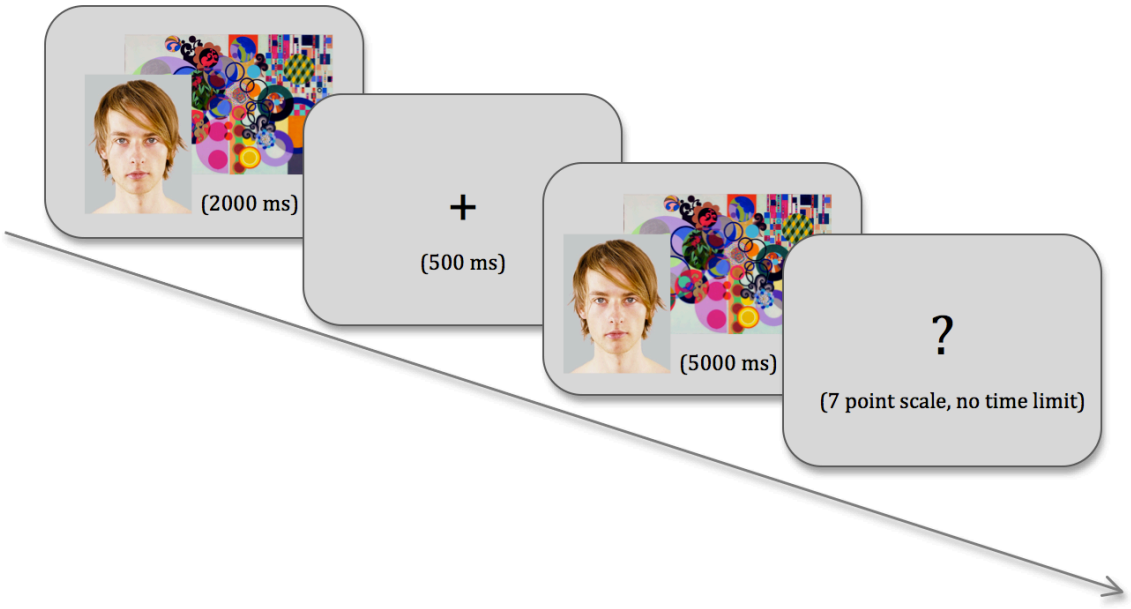

Figure 4. *Schematic representation of the experimental procedure: 2000 ms presentation series; 500 ms crosshairs; 5000 ms rating series; 7 point-rating scale without time restriction.*

One week later, the raters participated in a second rating session with the same procedure as during the first session. After the main experiment, the participants additionally filled out an internally developed questionnaire on art interest and expertise as well as two personality questionnaires: The Sensation Seeking Scale (SSS-V) and one of the five dimensions of the NEO-PI-R (namely items regarding *Openness to Experience*).

5 Results and discussion

In line with expected results as well as in agreement with Hönekopp's reported findings and the bulk of past research, the reliability of face scores in the facial attractiveness condition was very high in both groups and for both sessions, respectively. This supports Hönekopp's argument that Cronbach's Alpha is insufficient to unravel shared and private taste contributions, as individual differences are averaged out. The average inter-judge agreement was moderate in both groups, always higher during the second session, and generally slightly higher in the shared taste group, as expected. The retest reliability was, on average, also rather high for both groups.

In the abstract art appreciation condition, the reliability of the artwork scores was high in both groups and sessions as well, again showcasing the unsuitability of reporting Cronbach's Alpha, especially when contrasted with further results (cf. section 5.2). The average inter-judge agreement was quite low, and while the retest reliability was, on average, rather high, it was considerably lower in the shared taste group, suggesting that the participants who were asked to rate the paintings based on shared taste could not fully remember their prior judgements from one session to the next, resulting in greater variation. The data is summarized in Table 1.

Table 1

Reliability of stimulus scores, average inter-judge agreement and average retest reliability.

	Facial attractiveness				Abstract art appreciation			
	Private taste		Shared taste		Private taste		Shared taste	
Coefficients	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
Reliability of stimulus scores [1]	.98	.98	.98	.99	.92	.92	.92	.92
Inter-judge agreement [2]	.48	.53	.56	.58	.19	.19	.21	.20
Retest reliability [3]	.79		.78		.73		.63	

Notes. [1] Reported as Cronbach's α; [2] average across all judges, reported as r; [3] average computed from pairs of judges, reported as r.

For both groups and in accordance with Hönekopp's reported methods, variance components were estimated from analysis of variance (ANOVA) mean squares with a restricted maximum likelihood (REML) approach, treating judges, faces, and the time of

testing (first VS second session) as random variables. In addition, a linear mixed effects (lme) analysis was carried out for both groups, and yielded the same results.

Although ways for calculating standard errors and confidence intervals for variance components have been worked out (e.g. Burdick & Graybill, 1992), the agreement in the literature is that such confidence intervals are asymmetric, and thus "summarizing the precision of a variance component estimate by giving an approximate standard error is woefully inadequate" (Bates, 2010, p. 19). For this reason, we abstain from reporting standard errors or confidence intervals for the estimated variance components.

For reasons of clarity and comprehensibility and because the two stimulus conditions are to be treated as separate research questions, results for facial attractiveness and art appreciation are presented separately.

5.1 Facial attractiveness

The results are listed in Table 2. In the private taste group, results for *bi* were as follows: bi_1 = .36, and bi_2 = .44. In the shared taste group, the analysis yielded bi_1 = .28, and bi_2 = .33.

Table 2

*Analysis of Variance Mean Squares (*MS*s), Estimated Variance Components, and Beholder Indices (*bi*s) for the private and shared taste groups (facial attractiveness condition)*

	Private taste				Shared taste			
Source of variation or *bi*	*df*	*MS*	Estimated *varcomp*	% of total variance	*df*	*MS*	Estimated *varcomp*	% of total variance
Face	99	115.16	1.179	44.7	99	136.28	1.432	50.7
Judge X Face	4653	1.84	0.677	25.7	4554	1.64	0.543	19.2
Judge	47	56.83	0.260	9.9	46	47.83	0.173	6.1
Session	1	39.66	0.008	0.3	1	49.19	0.008	0.3
Session X Judge	47	3.44	0.030	1.1	46	12.15	0.116	4.1
Session X Face	99	0.59	0.002	0.1	99	0.52	0.000	0.0
Error	4653	0.48	0.480	18.2	4554	0.55	0.553	19.6
bi_1			.36				.28	
bi_2			.44				.33	

Note. bi_1 = beholder index under the assumption that judge-score differences are meaningless; bi_2 = beholder index under the assumption that judge-score differences are meaningful.

It is regrettable that it is not possible to calculate whether the difference between the two groups' indices is significant, yet *bi*, which expresses the amount of meaningful variance explained by private taste, is indeed lower in the shared taste group, suggesting that the manipulation attempted was successful, even if not to a very large extent. This is however most likely due to the stimuli used: The facial stimulus sample was quite skewed to the right in terms of mean attractiveness as rated in the preliminary study, with the highest attractiveness rating reaching only 5.6 on a 7-point scale (M = 2.97, Mdn = 2.68). It seems that the models used were all on the less attractive side, causing most participants to agree in their (low) ratings – an ecologically valid attractiveness spectrum as stressed by Hönekopp was thus not properly represented in the stimulus sample used in the present study. Additionally, the faces from one of the databases in particular were very bright, almost overexposed, and airbrushed so heavily that some participants asked whether they were digitally morphed. I argue that clearer results in regards to the task instruction manipulation could be obtained by using a different, more representative, and natural-looking face sample.

The present results do however appear to lend some support to the evolutionary theory of attractiveness: As can be seen from the examples in figure 5, the stimuli that received some of the lowest ratings all had skin discolorations, distinctive features, or obvious asymmetry in their facial features. Under the assumption that attractiveness is a signal of good genes (e.g. Langlois et al., 2000; Little et al., 2011b), these features may be seen as indicators of bad health, therefore evoking similar ratings and agreement among the participants.

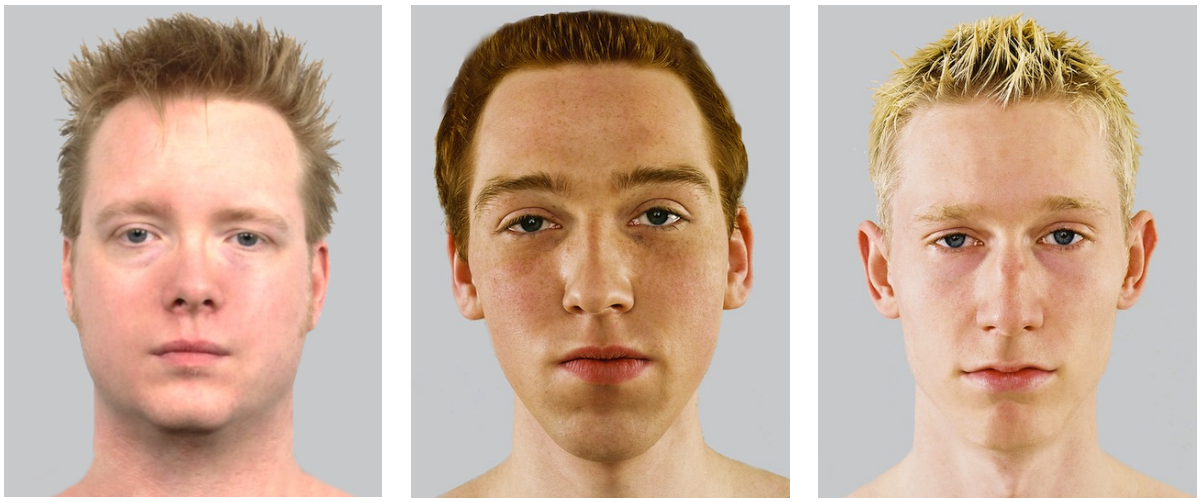

Figure 5. *Examples of low-rated facial stimuli.*

All in all, whether inter-individual differences in judge scores are regarded as meaningful (bi_2) or not (bi_1), shared taste accounted for the greater part of meaningful variance stable over time in the present sample, with the *bi* value, however, comparably higher in the private taste group, as predicted. The task instruction manipulation can thus be assumed to have been successful.

5.2 Abstract art appreciation

The results are listed in Table 3. In the private taste group, results for *bi* were as follows: bi_1 = .75, and bi_2 = .79. In the shared taste group, the analysis yielded bi_1 = .68, and bi_2 = .73.

Table 3

*Analysis of Variance Mean Squares (*MS*s), Estimated Variance Components, and Beholder Indices (*bi*s) for the private and shared taste groups (abstract art appreciation condition)*

Source of variation or *bi*	Private taste				Shared taste			
	df	*MS*	Estimated *varcomp*	% of total variance	*df*	*MS*	Estimated *varcomp*	% of total variance
Artwork	99	47.75	0.460	15.9	99	45.32	0.453	17.9
Judge X Artwork	4653	3.34	1.342	46.5	4554	2.72	0.967	38.1
Judge	47	82.80	0.380	13.2	46	62.12	0.273	10.8
Session	1	55.21	0.011	0.4	1	26.92	0.005	0.2
Session X Judge	47	4.07	0.034	1.2	46	5.69	0.049	1.9
Session X Artwork	99	0.94	0.006	0.2	99	0.72	0.000	0.0
Error	4653	0.65	0.653	22.6	4554	0.79	0.789	31.1
bi_1			.75				.68	
bi_2			.79				.73	

Note. bi_1 = beholder index under the assumption that judge-score differences are meaningless; bi_2 = beholder index under the assumption that judge-score differences are meaningful.

In line with the main hypothesis, private taste evidently explained the most meaningful variance stable over time, regardless of whether the participants were asked to rate the paintings according to their own or other people's taste, with the judge and artwork interaction ($varcomp_{JxA}$) explaining the most variance in both cases. Contrary to the popular belief that abstract art is a universal expression of pure emotion, the lack of semantic content rather seems to grant greater opportunities for subjective interpretation.

It is worth noting that despite the *bi*s being slightly lower in the shared taste condition – at first glance suggesting that participants may indeed have managed to find at least some common denominators of taste in the presented paintings – this conclusion is at odds with the previous finding of decreased retest reliability (see Table 1). When taking a closer look at the variance components making up *bi* in the shared taste group, it becomes clear that the artwork itself (shared taste) only explained an additional 2% of variance, while the estimated error component is much higher than in the private taste group. It is therefore not advisable to draw the conclusion that the manipulation was indeed successful when rating abstract art. Further studies, preferably using representational paintings, are needed to clear the issue; the present data merely supports the hypothesis that the lack of meaningful content of abstract paintings causes participants to rely on their own taste and individual associations when rating an artwork, regardless of the task instruction.

In conclusion, when rating abstract artworks, whether inter-individual differences in judge scores are regarded as meaningful (bi_2) or not (bi_1), private taste accounts for the greatest part of meaningful variance stable over time.

5.2.1 Questionnaires

As expected from the literature, self-reported art interest and art expertise correlated moderately (r = .32, p = .001). Self-reported art interest ranged from 22.9% to 79.0%, averaging 50.1% across all participants. The mean for all correctly answered art-related questions (10 multiple-choice questions regarding art history, and the correct determination of artist and/or art movement for eight presented artworks) was 34.8%, ranging from 8.8% to 67.6%. The cut-off value had been decided to lie at 75% (i.e. the upper quartile would be considered "art experts"), therefore, no participant was excluded on the grounds of art expertise.

In line with previous personality research, a strong positive correlation was found between *Openness to Experience* and *Sensation Seeking* (r = .41, p = .000). Since *Openness to Experience* is predictive of a generally higher appreciation of visual art, and *Sensation Seeking* is related to a higher liking of abstract art, participants who scored in

the upper 25% in at least one of these dimensions were selected (*N* = 71, of which 34 in the private taste group), and the analysis was repeated. The results are listed in Table 4.

In the private taste group, results for *bi* were as follows: bi_1 = .75, and bi_2 = .78. In the shared taste group, the analysis yielded bi_1 = .70, and bi_2 = .75. Since the *bi* values are virtually the same as those for the entire sample regardless of personality trait scores, I conclude that scoring high on personality traits which are usually predictive of a higher liking of (abstract) art does not have a discernible impact on the relative influence of private and shared taste on ratings.

Table 4

*Analysis of Variance Mean Squares (*MS*s), Estimated Variance Components, and Beholder Indices (*bi*s) for participants scoring in the upper quartile of* Openness to Experience *and/or* Sensation Seeking *in the private and shared taste groups (abstract art appreciation condition)*

	Private taste				Shared taste			
Source of variation or *bi*	*df*	*MS*	Estimated *varcomp*	% of total variance	*df*	*MS*	Estimated *varcomp*	% of total variance
Artwork	99	36.59	0.484	16.4	99	34.75	0.432	16.7
Judge X Artwork	3267	3.53	1.415	48.0	3564	2.77	1.002	38.6
Judge	33	66.89	0.299	10.1	36	74.06	0.326	12.6
Session	1	31.94	0.008	0.3	1	21.84	0.004	0.2
Session X Judge	33	4.35	0.037	1.3	36	6.89	0.061	2.4
Session X Artwork	99	0.88	0.005	0.7	99	0.76	0.000	0.0
Error	3267	0.70	0.698	23.7	3564	0.77	0.769	29.6
bi_1			.75				.70	
bi_2			.78				.75	

Note. bi_1 = beholder index under the assumption that judge-score differences are meaningless; bi_2 = beholder index under the assumption that judge-score differences are meaningful.

6 Conclusion

The present study provides initial evidence that raters' judgements of facial attractiveness can be manipulated by use of a task instruction worded specifically to elicit an either shared or private taste response. The *bi*, which expresses the amount of meaningful variance explained by private taste, was found to be slightly higher in the private taste group, suggesting that participants were able to deliberately adopt a collective perspective in the shared taste group. This is a finding that should be accounted for in any future research targeting participants' liking or attractiveness judgements of visual stimuli.

The present study is of course not without shortcomings. The relatively high inter-rater agreement and low impact of private taste found in the present sample (when compared to findings by Hönekopp, 2006, and Lucker, Beane, & Guire, 1981) is most likely due to the stimulus material used, as already argued above (cf. section 5.1). Additionally, the sample itself, consisting mostly of (psychology) undergraduates, may also have contributed to the high impact of shared taste. University students likely have more experience with popular culture and the media's beauty ideals than other people, resulting in higher agreement due to their high exposure to western media. Furthermore, attractiveness research, the present experiment being no exception, has the flaw of generally reducing perceived attractiveness to a simplistic aspect, i.e. the visual appearance of faces. Although faces are the most important contributors to attractiveness, they should not be separated from the bodies during the judgements, since these also provide attractiveness clues (e.g. Currie & Little, 2009). Additionally, as Hönekopp already pointed out, differences in judge scores should be accounted for in future research: Singles and individuals with a promiscuous socio-sexual orientation, i.e. people with high mate-search motivation, are bound to have higher judge scores.

For abstract art, the manipulation did not show the same pattern, which was expected: Private taste accounted for a significant part of meaningful variance stable over time regardless of the task instruction. I argue that this is due to abstract artworks' ambiguity and lack of semantic content, which appears to grant greater opportunities for subjective interpretation and thus leads to low rater agreement. Further studies comparing abstract artworks with representational ones will surely allow greater

insight into the effectiveness of manipulating the task instruction. Further research investigating differences in the "manipulation-potential" of laypeople as opposed to art experts may also be insightful.

In conclusion, the present thesis can be said to have provided some additional understanding of the mechanisms underlying the influence of private and shared taste on the perceived attractiveness of male faces, as well as the appreciation of abstract artworks by laypeople, by using a task instruction manipulation.

References

Alley, T. R., & Cunningham, M. R. (1991). Averaged faces are attractive, but very attractive faces are not average. *Psychological Science, 2*, 123-125. doi:10.1111/j.1467-9280.1991.tb00113.x

Apicella, C. L., Little, A. C., & Marlowe, F. W. (2007). Facial averageness and attractiveness in an isolated population of hunter-gatherers. *Perception, 36*, 1813-1820. doi:10.1068/p5601

Baker, R. R. (1997). Copulation, masturbation, and infidelity. State-of-the-art. In A. Schmitt, K. Atzwanger, K. Grammer, & K. Schäfer (Eds.), *New Aspects of Human Ethology* (pp. 163-188). New York, NY: Springer.

Bates, D. M. (2010). *lme4: Mixed-effects modeling with R*. Retrieved from http://lme4.r-forge.r-project.org/lMMwR/lrgprt.pdf

Beauducel, A., Strobel, A., & Brocke, B. (2003). Psychometrische Eigenschaften und Normen einer deutschsprachigen Fassung der Sensation Seeking-Skalen, Form V. *Diagnostica, 49*, 61-72. doi:10.1026//0012-1924.49.2.61

Belke, B., Leder, H., & Augustin, M. D. (2006). Mastering style: Effects of explicit style-related information, art knowledge and affective state on appreciation of abstract paintings. *Psychology Science, 48*, 115-134.

Bereczkei, T., Gyuris, P., Koves, P., & Bernath, L. (2002). Homogamy, genetic similarity, and imprinting; Parental influence on mate choice preferences. *Personality and Individual Differences, 33*, 677-690. doi:10.1016/S0191-8869(01)00182-9

Bereczkei, T., Gyuris, P., & Weisfeld, G. E. (2004). Sexual imprinting in human mate choice. *Proceedings of the Royal Society of London B, 271*, 1129-1134. doi:10.1098/rspb.2003.2672

Berlyne, D. E. (1970). Novelty, complexity and hedonic value. *Perception & Psychophysics, 8*, 279-286. doi:10.3758/BF03212593

Boothroyd, L. G., Jones, B. C., Burt, D. M., DeBruine, L. M., & Perrett, D. I. (2008). Facial correlates of socio-sexuality. *Evolution and Human Behavior, 29*, 211-218. doi:10.1016/j.evolhumbehav.2007.12.009

Brennan, R. L. (2001). *Generalizability theory*. New York: Springer.

Bressan, P., & Dal Martello, M. F. (2002). Talis pater, talis filius: Perceived resemblance and the belief in genetic relatedness. *Psychological Science, 13*, 213-218. doi:10.111/1467-9280.00440

Burdick, R. K., & Graybill F. A. (1992). *Confidence intervals on variance components*. New York: Marcel Dekker Inc.

Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences, 12*, 1-40. doi:10.1017/s0140525x00023992

Buss, D. M., & Barnes, M. (1986). Preferences in human mate selection. *Journal of Personality and Social Psychology, 50*, 559-570. doi:10.1037/0022-3514.50.3.559

Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review, 100*, 204-232. doi:10.1037/0033-295X.100.2.204

Chen, C. C., Wu, J. H., & Wu, C. C. (2011). Reduction of image complexity explains aesthetic preference for symmetry. *Symmetry, 3*, 443-456. doi:10.3390/sym3030443

Cunningham, M. R., Barbee, A. P., & Philhower, C. L. (2002). Dimensions of facial physical attractiveness: The intersection of biology and culture. In G. Rhodes & L. A. Zebrowitz (Eds.), *Facial attractiveness: Evolutionary, cognitive, and social perspectives* (pp. 193-238). Westport, CT: Ablex.

Cunningham, M. R., Barbee, A. P., & Pike, C. L. (1990). What do women want? Facialmetric assessment of multiple motives in the perception of male facial physical attractiveness. *Journal of Personality and Social Psychology, 59*, 61-72. doi:10.1037/0022-3514.59.1.61

Cunningham, M. R., Roberts, A. R., Barbee, A. P., Druen, P. B., & Wu, C. H. (1995). "Their ideas of beauty are, on the whole, the same as ours": Consistency and variability in the cross-cultural perception of female attractiveness. *Journal of Personality and Social Psychology, 68*, 261-279. doi:10.1037/0022-3514.68.2.261

Currie, T. E., & Little, A. C. (2009). The relative importance of the face and body in judgments of human physical attractiveness. *Evolution and Human Behavior, 30*, 409-416. doi:10.1016/j.evolhumbehav.2009.06.005

Darwin, C. (1871). *The descent of man, and selection in relation to sex*. London (UK): Murray.

DeBruine, L. M. (2002). Facial resemblance enhances trust. *Proceedings of the Royal Society of London B, 269*, 1307-1312. doi:10.1098/rspb.2002.2034

DeBruine, L. M. (2004). Facial resemblance increases the attractiveness of same-sex faces more than other-sex faces. *Proceedings of the Royal Society of London B, 271*, 2085-2090. doi:10.1098/rspb.2004.2824

DeBruine, L. M. (2005). Trustworthy but not lustworthy: Context-specific effects of facial resemblance. *Proceedings of the Royal Society of London B, 272*, 919-922. doi:10.1098/rspb.2004.3003

DeBruine, L. M., & Jones, B. C. (2006). *Why study physical attractiveness?* Retrieved from http://www.faceresearch.org/students/attractiveness

DeBruine, L. M., Jones, B. C., Crawford, J. R., Welling, L. L. M., & Little, A. C. (2010). The health of a nation predicts their mate preferences: Cross-cultural variation in women's preferences for masculinized male faces. *Proceedings of the Royal Society of London B, 277*, 2405-2410. doi:10.1098/rspb.2009.2184

DeBruine, L. M., Smith, F. G., Jones, B. C., Roberts, S. C., Petrie, M., & Spector, T. D. (2009). Kin recognition signals in adult faces. *Vision Research, 49*, 38-43. doi:10.1016/j.visres.2008.09.025

Dion, K. K. (2002). Cultural perspectives on facial attractiveness. In G. Rhodes & L. A. Zebrowitz (Eds.), *Facial attractiveness: Evolutionary, cognitive, and social perspectives* (pp. 239-259). Westport, CT: Ablex.

Dion, K. K., Berscheid, E., & Walster, E. (1972). What is beautiful is good. *Journal of Personality and Social Psychology, 24*, 285-290. doi:10.1037/h0033731

Dipboye, R. L., Fromkin, H. L., & Wiback, K. (1975). Relative importance of applicant sex, attractiveness, and scholastic standing in evaluation of job applicant resumes. *Journal of Applied Psychology, 60*, 39-43. doi:10.1037/h0076352

Dissanayake, E. (2007). What art is and what art does: An overview of contemporary evolutionary hypotheses. In C. Martindale, P. Locher, & V. Petrov (Eds.), *Evolutionary and neurocognitive approaches to aesthetics, creativity, and the arts* (pp. 1-14). Amityville, NY: Baywood.

Eisenman, R., & Gellens, H. K. (1968). Preferences for complexity-simplicity and symmetry-asymmetry. *Perceptual and Motor Skills, 26*, 888-890. doi:10.2466/pms.1968.26.3.888

Eva, K. W., & Wood, T. J. (2006). Are all the taken men good? An indirect examination of mate-choice copying in humans. *Canadian Medical Association Journal, 175*, 1573-1574. doi:10.1503/cmaj.061367

Fechner, G. T. (1876). *Vorschule der Ästhetik*. Leipzig, Germany: Breitkopf & Härtel. Reprint retrieved from http://www.uni-leipzig.de/~psycho/wundt/opera/fechner/vrschul1/VAesth09.htm

Feingold, A. (1992). Good-looking people are not what we think. *Psychological Bulletin, 111,* 304-341. doi:10.1037/0033-2909.111.2.304

Feist. G. J. (1998). A meta-analysis of the impact of personality on scientific and artistic creativity. *Personality and Social Psychological Review, 2*, 290-309. doi:10.1207/s15327957pspr0204_5

Feist, G. J., & Brady, T. R. (2004). Openness to experience, non-conformity, and the preference for abstract art. *Empirical Studies of the Arts, 22*, 77-89. doi:10.2190/Y7CA-TBY6-V7LR-76GK

Folstad, I., & Karter, A. J. (1992). Parasites, bright males and the immunocompetence handicap. *The American Naturalist, 139*, 603-622. doi:10.1086/285346

Frijda, N. H. (1986). *The Emotions*. Cambridge (UK): Cambridge University Press.

Furnham, A., & Bunyan, M. (1988). Personality and art preferences. *European Journal of Personality, 2*, 67-74. doi:10.1002/per.2410020106

Furnham, A., & Walker, J. (2001). Personality and judgments of abstract, pop art, and representational paintings. *European Journal of Personality, 15*, 57-72. doi:10.1002/per.340

Galton, F. (1879). Composite portraits, made by combining those of many different persons into a single resultant figure. *The Journal of the Anthropological Institute of Great Britain and Ireland, 8*, 132-144. doi:10.2307/2841021

Gangestad, S. W., & Buss, D. M. (1993). Pathogen prevalence and human mate preferences. *Ethology and Sociobiology, 14*, 89-96. doi:10.1016/0162-3095(93)90009-7

Gangestad, S. W., & Simpson, J. A. (2000). The evolution of human mating: Trade-offs and strategic pluralism. *Behavioral and Brain Sciences, 23*, 573-644. doi:10.1017/S0140525X0000337X

García, L. F., Aluja, A., García, Ó., Cuevas, L. (2005). Is Openness to Experience an independent personality dimension? Convergent and discriminant validity of the openness

domain and its NEO-PI-R facets. *Journal of Individual Differences, 26*, 132-138. doi:10.1027/1614-0001.26.3.132

Gilmore, D. C., Beehr, T. A., & Love, K. G. (1986). Effects of applicant sex, applicant physical attractiveness, type of rater and type of job on interview decisions. *Journal of Occupational Psychology, 59,* 103–109. doi:10.1111/j.2044-8325.1986.tb00217.x

Grammer, K., Fink, B., Juette, A., Ronzal, G., & Thornhill, R. (2002). Female faces and bodies: N-dimensional feature space and attractiveness. In G. Rhodes & L. A. Zebrowitz (Eds.), *Facial attractiveness: Evolutionary, cognitive, and social perspectives* (pp. 91-125). Westport, CT: Ablex.

Grammer, K., & Thornhill, R. (1994). Human (homo sapiens) facial attractiveness and sexual selection: The role of symmetry and averageness. *Journal of Comparative Psychology, 108*, 233–242. doi:10.1037/0735-7036.108.3.233

Gridley, M. C. (2013). Preference for abstract art according to thinking styles and personality. *North American Journal of Psychology, 15*, 463-481.

Hill, S. E., & Buss, D. M. (2008). The mere presence of opposite-sex others on judgments of sexual and romantic desirability: Opposite effects for men and women. *Personality and Social Psychology Bulletin, 34*, 635-647. doi:10.1177/0146167207313728

Hönekopp, J. (2006). Once more: Is beauty in the eye of the beholder? Relative contributions of private and shared taste to judgments of facial attractiveness. *Journal of Experimental Psychology: Human Perception and Performance, 32,* 199-209*.* doi:10.1037/0096-1523.32.2. 199

Jacobsen, T., & Höfel, L. (2002). Aesthetic judgments of novel graphic patterns: Analyses of individual judgments. *Perceptual and Motor Skills, 95*, 755-766. doi:10.2466/pms.2002.95.3. 755

Jones, B. C., DeBruine, L. M., & Little, A. C. (2007). The role of symmetry in attraction to average faces. *Perception & Psychophysics, 69*, 1273-1277. doi:10.3758/BF03192944

Jones, B. C., DeBruine, L. M., Little, A. C., Burriss, R. P., & Feinberg, D. R. (2007). Social transmission of face preferences among humans. *Proceedings of the Royal Society of London B, 274*, 899-903. doi:10.1098/rspb.2006.0205

Jones, B. C., DeBruine, L. M., Little, A. C., & Feinberg, D. R. (2007). The valence of experience with faces influences generalized preferences. *Journal of Evolutionary Psychology, 5*, 119-129. doi:10.1556/JEP.2007.1001

Jones, B. C., Little, A. C., Penton-Voak, I. S., Tiddeman, B. P., Burt, D. M., & Perrett, D. I. (2001). Facial symmetry and judgements of apparent health: Support for a "good genes" explanation of the attractiveness-symmetry relationship. *Evolution and Human Behavior, 22*, 417-429. doi:10.1016/S1090-5138(01)00083-6

Kaminski, G., Dridi, S., Graff, C., & Gentaz, E. (2009). Human ability to detect kinship in strangers' faces: Effects of the degree of relatedness. *Proceedings of the Royal Society of London B, 276,* 3193-3200. doi:10.1098/rspb.2009.0677

Kawabata, H., & Zeki, S. (2004). Neural correlates of beauty. *Journal of Neurophysiology, 91*, 1699-1705. doi:11.1152/jn.00696.2003

Kozbelt, A., & Seeley, W. P. (2007). Integrating art historical, psychological, and neuroscientific explanations of artists' advantages in drawing and perception. *Psychology of Aesthetics, Creativity, and the Arts, 1*, 80-90. doi:10.1037/1931-3896.1.2.80

Krupp, D. B., DeBruine, L. A., & Barclay, P. (2008). A cue of kinship promotes cooperation for the public good. *Evolution and Human Behavior, 29*, 49-55. doi:10.1016/j.evolhumbehav. 2007.08.002

Landau, M. J., Greenberg, J., Solomon, S., Pyszczynski, T., & Martens, A. (2006). Windows into nothingness: Terror management, meaninglessness, and negative reactions to modern art. *Journal of Personality and Social Psychology, 90*, 879-892. doi:10.1037/0022-3514.90.6.879

Langlois, J. H., Kalakanis, L., Rubenstein, A. J., Larson, A., Hallam, M., & Smoot, M. (2000). Maxims or myths of beauty? A meta-analytic and theoretical review. *Psychological Bulletin, 126*, 390-423. doi:10.1037/0033-2909.126.3.390

Langlois, J. H., Ritter, J. M., Casey, R. J., & Sawin, D. B. (1995). Infant attractiveness predicts maternal behaviors and attitudes. *Developmental Psychology, 31*, 464–472. doi:10.1037/ 0012-1649.31.3.464

Langlois, J. H., Ritter, J. M., Roggman, L. A., & Vaughn, L. S. (1991). Facial diversity and infant preferences for attractive faces. *Developmental Psychology, 27*, 79-84. doi:10.1037/0012-1649.27.1.79

Langlois, J. H., & Roggman, L. A. (1990). Attractive faces are only average. *Psychological Science, 1*, 115-121. doi:10.1111/j.1467-9280.1990.tb00079.x

Langlois, J. H., Roggman, L. A., Casey, R. J., Ritter, J. M., Rieser-Danner, L. A., & Jenkins, V. Y. (1987). Infant preferences for attractive faces: Rudiments of a stereotype? *Developmental Psychology, 23*, 363-369. doi:10.1037/0012-1649.23.3.363

Langner, O., Dotsch, R., Bijlstra, G., Wigboldus, D. H. J., Hawk, S. T., & van Knippenberg, A. (2010). Presentation and validation of the Radbound Faces Database. *Cognition & Emotion, 24*, 1377-1388. doi:10.1080/02699930903485076

Leder, L., Belke, B., Oeberst, A., & Augustin, D. (2004). A model of aesthetic appreciation and aesthetic judgments. *British Journal of Psychology, 95*, 489-508. doi:10.1348/ 0007126042369811

Leder, H., Gerger, G., Dressler, S. G., & Schabmann, A. (2012). How art is appreciated. *Psychology of Aesthetics, Creativity, and the Arts, 6*, 2-10. doi:10.1037/a0026396

Lindell, A. K., & Mueller, J. (2011). Can science account for taste? Psychological insights into art appreciation. *Journal of Cognitive Psychology, 23*, 453-475. doi:10.1080/20445911.2011. 539556

Little, A. C., Burriss, R. P., Jones, B. C., DeBruine, L. M., & Caldwell, C. A. (2008). Social influence in human face preference: Men and women are influenced more for long-term than short-term attractiveness decisions. *Evolution and Human Behavior, 29*, 140-146. doi:10.1016/j.evolhumbehav.2007.11.007

Little, A., Burriss, R., Petrie, M., Jones, B. C., & Roberts, S. C. (2013). Oral contraceptive use in women changes preferences for male facial masculinity and is associated with partner facial

masculinity. *Psychoneuroendocrinology, 38*, 1777-1785. doi:10.1016/j.psyneuen.2013.02.014

Little, A. C., Burt, D. M., Penton-Voak, I. S., & Perrett, D. I. (2001). Self-perceived attractiveness influences human female preferences for sexual dimorphism and symmetry in male faces. *Proceedings of the Royal Society of London B*, 268, 39-44. doi:10.1098/rspb.2000.1327

Little, A. C., Cohen, D. L., Jones, B. C., & Belsky, J. (2007). Human preferences for facial masculinity change with relationship type and environmental harshness. *Behavioral Ecology and Sociobiology, 61*, 967-973. doi:10.1007/s00265-006-0325-7

Little, A. C., Jones, B. C., & DeBruine, L. M. (2011a). Facial attractiveness: Evolutionary based research. *Philosophical Transactions of the Royal Society of London B, 366*, 1638-1659. doi:10.1098/rstb.2010.0404

Little, A. C., Jones, B. C., DeBruine, L. M., & Caldwell, C. A. (2011b). Social learning and human mate preferences: A potential mechanism for generating and maintaining between-population diversity in attraction. *Philosophical Transactions of the Royal Society of London B, 366*, 366-375. doi:10.1098/rstb.2010.0192

Little, A. C., Jones, B. C., Penton-Voak, I. S., Burt, D. M., & Perrett, D. I. (2002). Partnership status and the temporal context of relationships influence human female preferences for sexual dimorphism in male face shape. *Proceedings of the Royal Society of London B, 269*, 1095-1100. doi:10.1098/rspb.2002.1984

Little, A. C., & Mannion, H. (2006). Viewing attractive or unattractive same-sex individuals changes self-rated attractiveness and face preferences in women. *Animal Behaviour, 72*, 981-987. doi:10.1016/j.anbehav.2006.01.026

Little, A. C., Penton-Voak, I. S., Burt, D. M., & Perrett, D. I. (2003). Investigating an imprinting-like phenomenon in humans: Partners and opposite-sex parents have similar hair and eye colour. *Evolution and Human Behavior, 24*, 43-51. doi:10.1016/S1090-5138(02)00119-8

Little, A. C., & Perrett, D. I. (2002). Putting beauty back in the eye of the beholder. *The Psychologist, 15*, 28-32.

Little, A. C., Saxton, T. K., Roberts, S. C., Jones, B. C., DeBruine, L. M., Vukovic, J., Perrett, D. I., Feinberg, D. R., & Chenore, T. (2010). Women's preferences for masculinity in male faces are highest during reproductive age range and lower around puberty and post-menopause. *Psychoneuroendocrinology, 35*, 912-920. doi:10.1016/j.psyneuen.2009.12.006

Lucker, G. W., Beane, W. E., & Guire, K. (1981). The idiographic approach to physical attractiveness research. *The Journal of Psychology, 107*, 57-67. doi:10.1080/00223980.1981.9915205

Manning, J. T., Scutt, D., & Lewis-Jones, D. I. (1998). Developmental stability, ejaculate size, and sperm quality in men. *Evolution and Human Behavior, 19*, 273-282. doi:10.1016/S1090-5138(98)00024-5

Manning, J. T., Scutt, D., Whitehouse, G. H., & Leinster, S. J. (1997). Breast asymmetry and phenotypic quality in women. *Evolution and Human Behavior, 18*, 223-236. doi:10.1016/S0162-3095(97)00002-0

Marlowe, C. M., Schneider, S. L., & Nelson, C. E. (1996). Gender and attractiveness biases in hiring decisions: Are more experienced managers less biased? *Journal of Applied Psychology, 81*, 11–21. doi:10.1037/0021-9010.81.1.11

Martindale, C., Moore, K., & Borkum, J. (1990). Aesthetic preference: Anomalous findings for Berlyne's psychobiological theory. *The American Journal of Psychology, 1* 53-80. doi:10.2307/1423259

McCrae, R. R. (1987). Creativity, divergent thinking, and openness to experience. *Journal of Personality and Social Psychology, 52*, 1258-1265. doi:10.1037/0022-3514.52.6.1258

Møller, A. P. (1997). Developmental stability and fitness: A review. *The American Naturalist, 149*, 916-932. doi:10.1086/286030

Møller, A. P., Christe, P., & Lux, E. (1999). Parasitism, host immune function, and sexual selection. *Quarterly Review of Psychology, 74*, 3-20. doi:10.1086/392949

Møller, A. P., & Thornhill, R. (1998). Bilateral symmetry and sexual selection: A meta-analysis. *The American Naturalist, 151*, 174-192. doi:10.1086/286110

Ostendorf, F., & Angleitner, A. (2004). *NEO-Persönlichkeitsinventar nach Costa und McCrae, revidierte Fassung (NEO-PI-R)*. Göttingen: Hogrefe.

Penton-Voak, I. S., Little, A. C., Jones, B. C., Burt, D. M., Tiddeman, B. P., & Perrett, D. I. (2003). Female condition influences preferences for sexual dimorphism in faces of male humans (homo sapiens). *Journal of Comparative Psychology, 117*, 264-271. doi:10.1037/0735-7036.117.3.264

Penton-Voak, I., Perrett, D. I., Castles, D. L., Kobayashi, T., Burt, D. M., Murray, L. K., & Minamisawa, R. (1999). Menstrual cycle alters face preference. *Nature, 399*, 741-742. doi:10.1038/21557

Perrett, D. I., Burt, D. M., Penton-Voak, I. S., Lee, K. J., Rowland, D. A., & Edwards, R. (1999). Symmetry and human facial attractiveness. *Evolution and Human Behavior, 20*, 295–307. doi:10.1016/S1090-5138(99)00014-8

Perrett, D.I., Lee, K.J., Penton-Voak, I., Rowland, D., Yoshikawa, S., Burt, D.M., Henzi, S.P., Castles, D.L., & Akamatsu, S. (1998). Effects of sexual dimorphism on facial attractiveness. *Nature, 394*, 884-887. doi:10.1038/29772

Perrett, D. I., Penton-Voak, I. S., Little, A. C., Tiddeman, B. P., Burt, D. M., Schmidt, N., Oxley, R., Kinloch, N., & Barrett, L. (2002). Facial attractiveness judgements reflect learning of parental age characteristics. *Proceedings of the Royal Society of London B, 269*, 873-880. doi:10.1098/rspb.2002.1971

Peterson, M. A., & Rhodes, G. (2003). *Perception of Faces, Objects, and Scenes: Analytic and Holistic Processes*. New York, NY: Oxford University Press.

Pike, A. W. G., Hoffmann, D. L., García-Diez, M., Pettitt, P. B., Alcolea, J., De Balbín, R., González-Sainz, C., de las Heras, C., Lasheras, J. A., Montes, R., & Zikhão, J. (2012). U-Series dating of paleolithic art in 11 caves in Spain. *Science, 336*, 1409-1413. doi:10.1126/science.1219957

Pollard, J. (1995). Attractiveness of composite faces: A comparative study. *International Journal of Comparative Psychology, 8*, 77-83.

Ramachandran, V. S., & Hirstein, H. (1999). The science of art: A neurological theory of aesthetic experience. *Journal of Consciousness Studies, 6*, 15-51.

Rhodes, G. (2006). The evolutionary psychology of facial beauty. *Annual Review of Psychology, 57*, 199–226. doi:10.1146/annurev.psych.57.102904.190208

Rhodes, G., Harwood, K., Yoshikawa, A., Nishitani, M., & McLean, I. (2002). The attractiveness of average faces: Cross-cultural evidence and possible biological basis. In G. Rhodes & L. A. Zebrowitz (Eds.), *Facial attractiveness: Evolutionary, cognitive, and social perspectives* (pp. 35-58). Westport, CT: Ablex.

Rhodes, G., Hickford, C., & Jeffery, L. (2000). Sex-typicality and attractiveness: Are supermale and superfemale faces super-attractive? *British Journal of Psychology, 91*, 125-140. doi:10.1348/000712600161718

Rhodes, G., Jeffery, L., Watson, T. L., Clifford, C. W. G., & Nakayama, K. (2003). Fitting the mind to the world: Face adaptation and attractiveness after-effects. *Psychological Science, 14*, 558-566. doi:10.1046/j.0956-7976.2003.psci_1465.x

Rhodes, G., Proffitt, F., Grady, J., & Sumich, A. (1998). Facial symmetry and the perception of beauty. *Psychonomic Bulletin & Review, 5*, 659–669. doi:10.3758/BF03208842

Rhodes, G., Sumich, A., & Byatt, G. (1999). Are average facial configurations attractive only because of their symmetry? *Psychological Science, 10*, 52-58. doi:10.1111/1467-9280.00106

Rhodes, G., & Tremewan, T. (1996). Averageness, exaggeration, and facial attractiveness. *Psychological Science, 7*, 105-110. doi:10.1111/j.1467-9280.1996.tb00338.x

Rhodes, G., Yoshikawa, S., Clark, A., Lee, K., McKay, R., & Akamatsu, S. (2001). Attractiveness of facial averageness and symmetry in non-western cultures: In search of biologically based standards of beauty. *Perception, 30*, 611-625. doi:10.1068/p3123

Rubenstein, A. J., Kalakanis, L., & Langlois, J. H. (1999). Infant preferences for attractive faces: A cognitive explanation. *Developmental Psychology, 35*, 848-855. doi:10.1037/0012-1649.35.3.848

Rubenstein, A. J., Langlois, J. H., & Roggman, L. A. (2002). What makes a face attractive and why: The role of averageness in defining facial beauty. In G. Rhodes & L. A. Zebrowitz (Eds.), *Facial attractiveness: Evolutionary, cognitive, and social perspectives* (pp. 1-33). Westport, CT: Ablex.

Russell, P. A. (2003). Effort after meaning and the hedonic value of paintings. *British Journal of Psychology, 94*, 99-110. doi:10.1348/000712603762842138

Schacht, A., Werheid, K., & Sommer, W. (2008). The appraisal of facial beauty is rapid but not mandatory. *Cognitive, Affective, & Behavioral Neuroscience, 8*, 132-142. doi:10.3758/CABN.8.2.132

Shavelson, R. J., & Webb. N. M. (1991). *Generalizability theory: A primer*. Newbury Park, CA: Sage.

Sigall, H., & Landy, D. (1973). Radiating beauty: Effects of having a physically attractive partner on person perception. *Journal of Personality and Social Psychology, 28*, 218-224. doi:10.1037/h0035740

Sigall, H., & Ostrove, N. (1975). Beautiful but dangerous: Effects of offender attractiveness and nature of the crime on juridical judgement. *Journal of Personality and Social Psychology, 31*, 410-414. doi:10.1037/h0076472

Silvia, P. J. (2005). Emotional responses to art: From collation and arousal to cognition and emotion. *Review of General Psychology, 9*, 342-357. doi:10.1037/1089-2680.9.4.342

Silvia, P. J. (2007). Knowledge-based assessment of expertise in the arts: Exploring aesthetic fluency. *Psychology of Aesthetics, Creativity, and the Arts, 1*, 247-249. doi:10.1037/1931-3896.1.4.247

Slater, A., Von der Schulenburg, C., Brown, E., Badenoch, M., Butterworth, G., Parsons, S., & Samuels, C. (1998). Newborn infants prefer attractive faces. *Infant Behavior and Development, 21*, 345-354. doi:10.1016/S0163-6383(98)90011-X

Tinio, P. P., & Leder, H. (2009). Just how stable are stable aesthetic features? Symmetry, complexity, and the jaws of massive familiarization. *Acta Psychologica, 130*, 241-250. doi:10.1016/j.actapsy.2009.01.001

Thornhill, R., & Gangestad, S.W. (1999). Facial attractiveness. *Trends in Cognitive Sciences, 3*, 452-460. doi:10.1016/S1364-6613(99)01403-5

Thornhill, R., Gangestad, S.W., & Comer, R. (1995). Human female orgasm and mate fluctuating asymmetry. *Animal Behaviour, 50*, 1601-1615. doi:10.1016/0003-3472(95) 80014-x

Thornhill, R., & Møller, A.P. (1997). Developmental stability, disease and medicine. *Biological Reviews, 72*, 497-548. doi:10.1111/j.1469-185x.1997.tb00022.x

Tobacyk, J. J., Myers, H., & Bailey, L. (1981). Field-dependence, sensation-seeking, and preference for paintings. *Journal of Personality Assessment, 45*, 270-277. doi:10.1207/ s15327752jpa4503_8

Valen, L.V. (1962). A study of fluctuating asymmetry. *Evolution, 16*, 125-142. doi:10.2307/ 2406192

Vanhaeren, M., d'Errico, F., Stringer, C., James, S. L., Todd, J. A., & Mienis, H. K. (2006). Middle paleolithic shell beads in Israel and Algeria. *Science, 312*, 1785-1788. doi:10.1126/science. 1128139

Vartanian, O., & Goel, V. (2004). Neuroanatomical correlates of aesthetic preference for paintings. *Cognitive Neuroscience and Neuropsychology, 15*, 893-897. doi:10.1097/01.wnr. 0000118723.38067.d6

Vessel, E. A., & Rubin, N. (2010). Beauty and the beholder: Highly individual taste for abstract, but not real-world images. *Journal of Vision, 10(2):18*, 1-14. doi:10.1167/10.2.18

Wagatsuma, E., & Kleinke, C.L. (1979). Ratings of facial beauty by Asian-American and Caucasian females. *Journal of Social Psychology, 109*, 299-300. doi:10.1080/00224545.1979. 9924207

Wilde, O. (1890). The Picture of Dorian Gray. New York, NY: Barnes & Noble Classics.

Wilson, G. D., & Ausman, J., & Mathews, T. R. (1973). Conservatism and art preferences. *Journal of Personality and Social Psychology, 25*, 286-288. doi:10.1037/h0033972

Yu, D. W., & Shepard, G. H. (1998). Is beauty in the eye of the beholder? *Nature, 396*, 321-322. doi:10.1038/24512

Zahavi, A. (1975). Mate selection: A Selection for a handicap. *Journal of Theoretical Biology, 53*, 205-214. doi:10.1016/0022-5193(75)90111-3

Zajonc, R. B. (1968). Attitudinal effects of mere exposure. *Journal of Personality and Social Psycholigy, 9(2)*, 1-27. doi:10.1037/h0025848

Zajonc, R. B. (2001). Mere exposure: A Gateway to the subliminal. *Current Directions in Psychological Science, 10*, 224-228. doi:10.1111/1467-8721.00154

Zebrowitz, L. A. (1997). *Reading faces: Window to the soul?* Boulder, CO: Westview Press.

Zebrowitz, L. A., & Rhodes, G. (2002). Nature let a hundred flowers bloom: The multiple ways and wherefores of attractiveness. In G. Rhodes & L. A. Zebrowitz (Eds.), *Facial attractiveness: Evolutionary, cognitive, and social perspectives* (pp. 261-293). Westport, CT: Ablex.

Zuckerman, M. (2009). Sensation seeking. In M. R. Leary & R. H. Hoyle (Eds.), *Handbook of individual differences in social behavior* (pp. 455-465). New York, NY: Guildford Press.

Zuckerman, M., Kolin, E., Price, L., & Zoob, I. (1964). Development of a sensation seeking scale. *Journal of Consulting Psychology, 28*, 477-482. doi:10.1037/h0040995

Zuckerman, M., Ulrich, R. S., & McLaughlin, J. (1993). Sensation seeking and reactions to nature paintings. *Personality and Individual Differences, 15*, 563-576. doi:10.1016/0191-8869(93)90340-9

Appendix

List of figures

List of tables

Main study instructions

Welcome slide (Since the experimental blocks were balanced, half of the instructions stated "*In Block 1 sollen Sie Gesichter, in Block 2 abstrakte Bilder bewerten*"):

WILLKOMMEN!

Wir möchten Sie herzlich im Labor der Allgemeinen Psychologie begrüßen.

Wir danken Ihnen, dass Sie sich Zeit nehmen, an unserer Forschungsarbeit teilzunehmen.

Es geht dabei um die Erforschung von Unterschieden in der Kunst- und Gesichtswahrnehmung.

Das Experiment besteht aus zwei Blöcken: In Block 1 sollen Sie abstrakte Bilder, in Block 2 Gesichter bewerten.

Um fortzufahren, drücken Sie bitte die Leertaste!

PRIVATE TASTE abstract art appreciation block instruction:

Der Ablauf des ersten Blocks ist wie folgt:

Zunächst sehen Sie kurz alle abstrakten Bilder der Reihe nach eingeblendet. Dies dient dazu, Sie mit dem gesamten Bilder-Set vertraut zu machen – Sie müssen die Bilder zunächst nur aufmerksam betrachten!

Erst dann werden alle Bilder erneut gezeigt, jeweils gefolgt von einer 7-stufigen Ratingskala, auf der Sie einschätzen sollen, wie sehr Ihnen das Bild gefällt.

Es ist ganz wichtig, dass Sie die Bilder anhand Ihres PERSÖNLICHEN GESCHMACKES bewerten!

Wenn Sie noch Fragen haben, wenden Sie sich bitte jetzt an die Versuchsleiterin.

Bei Drücken der Leertaste startet der Präsentationsblock (Dauer ca. 3,5 Minuten)

(*Randomised presentation of all artworks; 2s*)

Sie werden die gleichen Bilder nun nochmals sehen.
Nach jedem Bild folgt jeweils eine 7-stufige Ratingskala.

Bewerten Sie die Bilder danach, wie sehr Ihnen diese GEFALLEN.
Je besser Ihnen ein Bild gefällt, desto höher der Wert:

1 = gefällt mir gar nicht
7 = gefällt mir sehr gut

Es gibt keine richtigen oder falschen Antworten,
es ist hier Ihre PERSÖNLICHE MEINUNG gefragt.

Es ist ganz wichtig, dass Sie die Bilder anhand Ihres
PERSÖNLICHEN GESCHMACKES bewerten!

Wir bitten Sie Ihr Urteil zügig und möglichst spontan abzugeben.

Beim Drücken der Leertaste geht's los!

(*Randomised presentation of each artwork; 5s, followed by the rating slide*)

Wie sehr gefällt Ihnen das Bild?

gefällt mir gar nicht 1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7 gefällt mir sehr gut

PRIVATE TASTE facial attractiveness block instruction:

VIELEN DANK!

Im zweiten Block geht es nun darum, Gesichter zu bewerten.

Der Ablauf dieses Blocks ist analog zum Vorherigen:

Zunächst sehen Sie kurz alle Gesichter der Reihe nach eingeblendet.
Dies dient dazu, Sie mit dem gesamten Gesichter-Set vertraut zu machen –
Sie müssen die Bilder zunächst nur aufmerksam betrachten!

Erst dann werden alle Gesichter erneut gezeigt,
jeweils gefolgt von einer 7-stufigen Ratingskala,
auf der Sie die Attraktivität des Gesichtes einschätzen sollen.

Bei Drücken der Leertaste startet der Präsentationsblock
(Dauer ca. 3,5 Minuten)

(*Randomised presentation of all faces; 2s*)

Sie werden die gleichen Gesichter nun nochmals sehen.
Nach jedem Gesicht folgt jeweils eine 7-stufige Ratingskala.

Bewerten Sie die Gesichter nach deren ATTRAKTIVITÄT.
Je attraktiver Sie ein Gesicht finden, desto höher der Wert:

1 = gar nicht attraktiv
7 = sehr attraktiv

Es gibt keine richtigen oder falschen Antworten,
es ist hier Ihre PERSÖNLICHE MEINUNG gefragt.

Da die präsentierten Gesichter aus unterschiedlichen Quellen stammen,
bitten wir Sie, Ihr Urteil nicht anhand der Bildqualität,
sondern ausschließlich anhand der Personen zu fällen.

Es ist ganz wichtig, dass Sie die Gesichter anhand Ihres
PERSÖNLICHEN GESCHMACKES bewerten!

Wir bitten Sie Ihr Urteil zügig und möglichst spontan abzugeben.

Beim Drücken der Leertaste geht's los!

(*Randomised presentation of each face; 5s, followed by the rating slide*)

Wie attraktiv finden Sie das Gesicht?

gar nicht attraktiv 1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7 sehr attraktiv

SHARED TASTE facial attractiveness block instruction:

Der Ablauf des ersten Blocks ist wie folgt:

**Zunächst sehen Sie kurz alle Gesichter der Reihe nach eingeblendet.
Dies dient dazu, Sie mit dem gesamten Gesichter-Set vertraut zu machen –
Sie müssen die Bilder zunächst nur aufmerksam betrachten!**

**Erst dann werden alle Gesichter erneut gezeigt,
gefolgt von einer 7-stufigen Ratingskala, auf der Sie einschätzen sollen,
wie sehr Sie glauben, dass das Gesicht ALLGEMEIN attraktiv ist.**

Es ist ganz wichtig, dass Sie die Gesichter NICHT nach Ihrem persönlichen Geschmack bewerten, sondern danach, wie sehr sie Ihrer Meinung nach ANDERE als allgemein attraktiv einschätzen würden.

**Wenn Sie noch Fragen haben,
wenden Sie sich bitte jetzt an die Versuchsleiterin.**

**Bei Drücken der Leertaste startet der Präsentationsblock
(Dauer ca. 3,5 Minuten)**

(*Randomised presentation of all faces; 2s*)

Sie werden die gleichen Gesichter nun nochmals sehen.
Nach jedem Gesicht folgt jeweils eine 7-stufige Ratingskala.

Bewerten Sie die Gesichter danach, wie sehr Sie glauben,
dass sie FÜR ANDERE attraktiv sind.

1 = finden andere gar nicht attraktiv
7 = finden andere sehr attraktiv

Da die präsentierten Gesichter aus unterschiedlichen Quellen stammen,
bitten wir Sie, Ihr Urteil nicht anhand der Bildqualität,
sondern ausschließlich anhand der Personen zu fällen.

Es gibt keine richtigen oder falschen Antworten,
es ist aber sehr wichtig, dass Sie die Gesichter danach bewerten,
wie sehr sie Ihrer Meinung nach ALLGEMEIN als attraktiv empfunden werden.

Bewerten Sie die Gesichter NICHT nach Ihrem persönlichen Geschmack, sondern danach,
wie sehr sie Ihrer Meinung nach ANDERE als allgemein attraktiv einschätzen würden.

Wir bitten Sie Ihr Urteil zügig und möglichst spontan abzugeben.

Beim Drücken der Leertaste geht's los!

(*Randomised presentation of each face; 5s, followed by the rating slide*)

Wie attraktiv ist dieses Gesicht allgemein?

finden andere gar nicht attraktiv 1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7 finden andere sehr attraktiv

SHARED TASTE abstract art appreciation block instruction:

VIELEN DANK!

Im zweiten Block geht es nun darum, abstrakte Bilder zu bewerten.

Der Ablauf dieses Blocks ist analog zum Vorherigen:

Zunächst sehen Sie kurz alle abstrakten Bilder der Reihe nach eingeblendet.
Dies dient dazu, Sie mit dem gesamten Bilder-Set vertraut zu machen –
Sie müssen die Bilder zunächst nur aufmerksam betrachten!

Erst dann werden alle Bilder erneut gezeigt,
gefolgt von einer 7-stufigen Ratingskala, auf der Sie einschätzen sollen,
wie sehr Sie glauben, dass das Bild ALLGEMEIN gefällt.

Bei Drücken der Leertaste startet der Präsentationsblock
(Dauer ca. 3,5 Minuten)

(*Randomised presentation of all artworks; 2s*)

Sie werden die gleichen Bilder nun nochmals sehen.
Nach jedem Bild folgt jeweils eine 7-stufige Ratingskala.

Bewerten Sie die Bilder danach, wie sehr Sie glauben, dass sie ANDEREN gefallen.

1 = gefällt allgemein gar nicht
7 = gefällt allgemein sehr gut

Es gibt keine richtigen oder falschen Antworten,
es ist aber sehr wichtig, dass Sie die Bilder danach bewerten,
wie sehr sie Ihrer Meinung nach ALLGEMEIN gefallen.

Bewerten Sie die Bilder NICHT nach Ihrem persönlichen Geschmack, sondern danach,
wie sehr sie Ihrer Meinung nach ANDEREN allgemein gefallen.

Wir bitten Sie Ihr Urteil zügig und möglichst spontan abzugeben.

Beim Drücken der Leertaste geht's los!

(*Randomised presentation of each artwork; 5s, followed by the rating slide*)

Wie sehr gefällt dieses Bild allgemein?

gefällt anderen gar nicht 1 -- 2 -- 3 -- 4 -- 5 -- 6 -- 7 gefällt anderen sehr gut

Final slide:

Herzlichen Dank für Ihre Teilnahme!

Wenden Sie sich jetzt bitte an die Versuchsleiterin!

Kurzzusammenfassung

Neue Befunde in der Attraktivitätsforschung weisen darauf hin, dass Schönheitsstandards nicht ausschließlich angeboren und evolutionär-biologisch verankert sind (Langlois et al., 2000), sondern auch von individuellen Lernerfahrungen und sozialen Zielen abhängen (Zebrowitz & Rhodes, 2002). Ähnlich wird das ästhetische Gefallen bei der Betrachtung von Kunstwerken als etwas äußerst Subjektives und von individuellem Geschmack Getriebenes angenommen, was durch persönliche Assoziationen und Interpretationen geprägt wird (Lindell, & Mueller, 2011). Dies trifft vor allem auf abstrakte Kunst zu, die per Definition frei von semantischen Inhalten und somit besonders interpretationsbedürftig und -offen ist (Leder et al., 2004; Vessel & Rubin, 2010).

In der vorliegenden Diplomarbeit wird der relative Beitrag von kollektivem und individuellem Geschmack auf die Bewertungen von Gesichtsattraktivität und den Gefallensurteilen zu abstrakten Kunstwerken mit Hilfe einer Instruktions-Manipulation untersucht. Die Ergebnisse liefern erste Hinweise darauf, dass der Einfluss von kollektivem und individuellem Geschmack auf die Beurteilung der wahrgenommenen Gesichtsattraktivität anhand der Formulierung der Aufgabeninstruktion manipuliert werden kann. Wie erwartet zeigte diese Manipulation in der Kunst-Bedingung nicht die gleiche Wirkung, da hier mehr Möglichkeiten für individuellen Geschmack vorliegen – individueller Geschmack hatte hier unabhängig von der Gruppenmanipulation immer einen größeren Einfluss auf die Gefallensurteile.

Curriculum Vitae

Angaben zur Person

Vor- und Nachname:	Tanya Rigotti
Staatsangehörigkeit:	Italien

Ausbildung

Feb 2011	1. Diplomprüfung
seit Sept 2009	Diplomstudium Psychologie an der Universität Wien
Juli 2009	Ablegung der Reifeprüfung
Aug 2007 – Mai 2008	Evans High School *4550 Cox Road, 30809 Evans, GA (USA)* Auslandsjahr an einer staatlichen Highschool
2004 – 2009	Deutschsprachiges Realgymnasium Bozen *Fagenstraße 10, 39100 Bozen (BZ), Italien* Ausbildungsschwerpunkt: Angewandte Naturwissenschaften
2001 – 2004	Deutsche Mittelschule Dr. Josef Noldin *Aldo-Moro-Straße 1, 39040 Salurn (BZ), Italien*
1996 – 2001	Deutsche Grundschule Salurn *Rathausplatz 17, 39040 Salurn (BZ), Italien*

Praktika und Anstellungen

Sep 2014 – Jan 2015	Institut für psychologische Grundlagenforschung an der Fakultät für Psychologie, Universität Wien Studienassistentin Lehrunterstützung Prüfungsunterstützung (Erstellung, Aufsicht, Korrektur) Betreuung von Studierenden organisatorische und administrative Tätigkeiten

Mär 2014 – Jun 2014	Institut für psychologische Grundlagenforschung Studienassistentin
Sep 2013 – Jan 2014	Institut für psychologische Grundlagenforschung Studienassistentin
Mär 2013 – Sep 2013	Projekt *Opioidempathy*, SCAN-Unit, Universität Wien Confederate
Sep 2012 – Jan 2013	Gerontopsychiatrische Station, SMZ Ost (Donauspital) Pflichtpraktikum im Rahmen des Psychologiestudiums
seit Okt 2011	Ticket Express GmbH (oeticket) Agent (Callcenter und Direktverkauf), Customer Care
Apr – Okt 2011	Mobile Nachhilfe Gelegentliche Italienisch und Englisch Nachhilfe
Mär 2010 – Jun 2011	Verein *PsychoForum* Ehrenamtliche Tätigkeit

Sonstiges

Fremdsprachen	Italienisch (ausgezeichnet) Englisch (ausgezeichnet)
EDV Kenntnisse	Erfahrung mit zahlreichen Betriebssystemen (Windows, Mac OS, Linux), sehr gute Office Kenntnisse, gute SPSS-Kenntnisse, grundlegende Kenntnisse von E-Prime, Photoshop und HTML

Wien, Juli 2014