Aesthetic taste and consumer demand for cultural goods: an application to theatre

Anita Zednik

Macquarie University

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Abstract

This paper puts forward and tests whether the philosophical concept of *aesthetic* taste (as a perceptive skill rather than a synonym for the notion 'preference') can explain two commonly observed phenomena in cultural goods consumption: firstly, the phenomenon that cultural goods are said to be an "acquired taste" in that some experience or knowledge is necessary to enjoy those goods. Current models account for this phenomenon by including proxy variables, such as past exposure, that offer little opportunity for arts policy makers or arts organisations to influence. The second phenomenon we aim to explain is the fact that goods that are aesthetically rewarding are generally not as highly demanded as those that are considered entertaining.
We use data from a discrete choice experiment that was conducted online with over 400 Sydney residents, using real theatre plays. Direct and indirect measures of individual aesthetic taste are developed. Binary conditional logit models and a latent class model were estimated from the survey data to test the hypotheses. An overall positive effect of aesthetic taste on consumer choice of cultural goods, separate from the effect of past attendance, is established.

INTRODUCTION

Whether it be visual arts exhibitions, opera performances, theatre plays or live music concerts, two phenomena can generally be observed amongst consumers: firstly, some people are passionate about a particular cultural good, whilst others remain indifferent or even get bored; secondly, the best-sellers are generally the ones considered the most entertaining rather than the most awe-inspiring, however these two qualities are defined.

Observing this difference between arts and non-arts consumers is not new. The arts are said to be "an acquired taste" and several cultural economists have written about this process of taste acquisition. For example, Bruce Seaman observes that "cultural economists have always stressed that current arts demand ... is especially influenced by past arts exposure" (Seaman 2006, p.441). Stable preferences, so the argument goes, cannot be

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assumed for the arts since exposure to artistic goods and acquisition of knowledge about such goods influence and change preferences. The same point is made when Morrison and West write that "It is generally accepted that the arts are an acquired taste that must first be cultivated before individuals voluntarily attend performances" (Morrison and West 1986, p.19), or when McCain defines very broadly that "In the process of cultivation of taste, tastes are changed by the experience of consumption" (McCain 1981, p. 332), or when Levy-Garboua and Montmarquette claim that "…taste for arts is acquired or discovered and the rate of art consumption increases over time with exposure" (Levy-Garboua and Montmarquette 2003, p.202). David Throsby emphasizes the point that tastes for artistic goods and services are cumulative: "It is apparent that a person's enjoyment of music, literature, drama, the visual arts and so on, and hence her willingness to spend money on consuming them, are importantly related to her knowledge and understanding of these art forms. Such cultural competence is acquired through education and experience, and hence stronger and more discriminating tastes for the arts are likely to be shown by the better educated and by those who have already become consumers" (2001, p. 115).

However, the conclusions drawn for policy-makers are somewhat circular in their reasoning; Seaman sums up the literature on arts demand by pointing out that current studies recommend "…increasing attendance by increasing attendance" (Seaman 2005, p.108). A concept is needed that can be incorporated into an economic analysis of demand for cultural goods that (a) breaks the circular advice currently given to policy-makers to increase attendance by increasing attendance (Seaman 2005, p.108); and (b) explains the heterogeneity in tastes for cultural goods between those looking for an aesthetic experience and those looking for entertainment.

In this paper we put forward and test the proposition that the concept of aesthetic taste can capture the "taste acquisition" phenomenon sufficiently and distinct from past exposure, and therefore provide more specific information to policy makers and arts organisations as to how to engage people in cultural goods consumption.

A significant number of philosophers have thought that the essence of arts consumption is development of aesthetic taste. Empirical research so far, however, has not attempted to measure this concept of taste directly or to investigate its role in economic demand as distinct from the role of other concepts such as past exposure and education.

REVIEW OF THE LITERATURE

Aesthetic taste, a perceptive skill

Economists have often used the notion of taste interchangeably with notions such as wants, ends, preferences or desires (Weizacker 1971; Stigler and Becker 1977; Pollak 1978; McPherson 1987; Pareto in Hutter and Shusterman 2006, p.187). Taste in the sense of preferences cannot be refined. It also cannot be quarrelled about. Taste in that sense is personal and subjective, and has to be taken as given. Thus, economists have made "taste" the same as or closely related to the notion of "preferences", which are defined as "liking for or estimation of one thing before or above another; prior favour or choice" or "that which one prefers; the object of prior choice; the favourite" (1998). A preference is a value judgment that is subjective and relative as it may change over time (Wright 1987).

Distinct from the way economists use taste, philosophers have defined *taste* as an ability in a person to understand and feel certain qualities in the world. Taste in this sense is described as "the sense of what is appropriate, harmonious, or beautiful; *esp.* discernment and appreciation of the beautiful in nature or art; *spec.* the faculty of perceiving and enjoying what is excellent in art, literature, and the like" (1998). In the 18th century, dozens of theories of taste were developed. Shaftesbury introduced the idea of disinterestedness into aesthetics (see for example Stolnitz 1961). Stolnitz sees disinterestedness as the central concept in aesthetics, as can be seen when he writes that "Ultimately the subject-matter of aesthetics is taken to be the experience of disinterested perception and the nature and value of its objects" (Stolnitz 1961, p.99). Hutcheson distinguishes taste from extensive knowledge

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"which is derived from external sensation" about details and measurements of the object in question, whereas men of fine taste have a "much more delightful perception of the whole" (Hutcheson 1729, p.10). He does add, however, that knowledge could possibly add additional "rational" pleasure. Reid defines taste as "that power of the mind by which we are capable of discerning and relishing the beauties of nature, and whatever is excellent in the fine arts" (Reid 1785/1852, VIII, I, p. 455). He distinguishes clearly between the pleasurable emotions a beautiful object produces, from the quality of the object itself that produces these emotions. He further distinguishes between people who experience pleasurable emotions when consuming something but don't know why this is so, from people who are "more enlightened"; who perceive the details of the object of taste and who understand the perceived beauty (Reid 1785/1852, VIII, I, p. 456).

The British philosopher David Hume argues that there are certain general principles of taste that are "… nearly, if not entirely the same in all men" (Hume 1757, p.7), which thus also implies that every person is capable of engaging these general principles of taste. However, the problem is that the "organs of perception" are often clouded in people, so that true taste is rare. Thus, only people who have unclouded taste, that is, who have delicacy of taste, who have gained practice through experience, who know enough to make appropriate comparisons, who have a "good sense" and lack prejudice are for Hume the people who define jointly the standard of taste.

Kant (1790/1987, p.476) identifies two fundamental necessary conditions that make a judgment of taste: subjectivity and universal validity. A subjective judgment is a judgment that is based on imagination (acting perhaps in conjunction with understanding as he notes) and is grounded in the subject's feeling of pleasure or displeasure. He distinguishes subjective judgments from empirical judgments that are based on cognition and logic. Empirical judgments refer to something in the *object*; something that is objective as opposed to judgments of taste that refer to something (pleasure or displeasure) in the *subject* and are thus subjective. The second characteristic of judgments of taste is "universal validity", which

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Kant derives from the already existing idea of disinterestedness as introduced by Shaftesbury. Being disinterested means that the person making the judgment has no interest or desire whatsoever in the real existence of the object of taste, since the delight, so he argues, that is connected with the real existence of an object always involves some desire. The sole important factor is whether or not the "mere representation" of the object is beautiful or ugly. Judgments that are made with even the slightest hint of an interest are partial and not pure judgments of taste (Kant 1790/1987, p. 477). It is this disinterestedness whereby the pleasure that judgments of taste are based on differ from pleasure in and judgments of the agreeable (such as food or wine); pleasure in what serves one's self-interest or moral satisfaction.

Based on these philosophical theories of taste we can define **aesthetic taste** as a form of perception, the perceptive faculty or faculties in humans that perceive(s) aesthetic qualities. **Aesthetic qualities** are qualities in artworks, the perception of which requires taste (Sibley 1959; Sibley 1965). They cannot be directly observed with the normal senses. They ultimately depend upon non-aesthetic qualities but the relationship between them is not condition-governed. The overall richness and arrangement of aesthetic qualities (the aesthetic character) of artworks are what makes artistic goods different from non-artistic goods. **Development of aesthetic taste** leads to greater sensitivity towards more subtle and complex aesthetic qualities. Aesthetic taste development takes place through experience and learning from people with more refined taste who make their aesthetic experiences and their perceptions of aesthetic qualities accessible. Refinement of taste can be defined as developing greater sensitivity of perception towards more subtle and complex aesthetic qualities. Addison argues that there are several ways to "cultivate and improve it" (Addison 1712): exposure to great works of arts, conversations with people who have developed taste, and reading ancient and modern critics' works.

Aesthetic taste can be seen as a form of perceptive expertise, which allows for the concept of aesthetic taste to be firmly grounded in empirical research in cognitive

psychology. Perceptual expertise refers to a particular kind of expertise where learning improves perception and categorization (Gauthier et al. 2009). Developing greater perceptual expertise in a subject field influences categorisation. Novices to a particular subject area tend to categorize objects first and fastest at their basic level (dog) rather than a superordinate (animal) or subordinate level (poodle) (Rosch et al. 1976). In contrast, experts in an area divide stimuli into finer categories than do novices since experts perceive more details in the objects. Thus, experts show a preference to identify objects at a level that is more specific, or subordinate to the basic level (Tanaka and Taylor 1991; Johnson and Mervis 1997). For example, a bird novice will identify a feathered animal at the basic level of "bird," in contrast to the expert bird-watcher, who will identify the same animal more specifically as a subordinate-level "sparrow" or "chipping sparrow." This downward shift in the level at which an object is first identified has become one of the behavioural hallmarks of perceptual expertise (Tanaka and Taylor 1991; Gauthier and Tarr 1997).

Alba and Hutchinson (1987) define *expertise* as the ability to perform product-related tasks successfully. They define *familiarity* as the accumulated level of product-related experiences (any contact with the domain). The distinction is quite clear and research has shown that the two concepts cannot be regarded as the same. For example, Tanaka et al. (2005) showed in their experiment that perceptual exposure (that is, simple exposure to the objects without sub-categorical training) does not have the same effect (development of perceptual expertise and thus being better at categorizing the experimental stimuli) than when participants were exposed to the objects and trained on sub-categorical levels.

Despite the clear distinction between experience and expertise, experience alone can also lead to incidental or unintentional learning. However, one major drawback of incidental learning is "the inability of subjects to articulate their reasoning process, which limits its usefulness in many decision problems" (Eisenstein 2010, p.8). This is an important point. Language use, the ability to name the categories by which one distinguishes objects seems to be an important feature of perceptual expertise that is lacking from pure exposure

or familiarity. It has been known for a long time that verbal cues (words) enhance recognition memory performance (Tulving and Osler 1968). Novices tend to use more abstract and general terms to describe their experiences than do experts, who use quite specific and precise terms (Lawless 1984). In 1990 Solomon noted that "experts appear to differ from nonexperts in their ability to use language to describe their perceptions" (Solomon 1990, p. 499). Latour and Latour (2010) distinguish between pure familiarity with a product and expertise when they define aficionados as "those who consume a product frequently and are enthusiastic about it but who have not obtained the highly developed product schemata and lexicon associated with expertise" (p. 688). In other words, aficionados are asymmetrical in their knowledge levels in that they have had a lot of product experience but lack the conceptual knowledge. They might have picked up different terms and chunks of knowledge but they have not structured their conceptual knowledge in a way that allows them to truly reflect their perceptual experience.

Empirical research on taste in consumer demand for cultural goods

In terms of aesthetic taste in economic research on arts demand, we make the following observations: Early research showed that attitude towards theatre (Andreasen and Belk 1980) had a positive effect on current consumption. A substantial report prepared by the U.S. National Endowment for the Arts in 1981 concluded that "interest in the performing arts while growing up is high on the list of predictors of adult attendance" (1981, p.6). Morrison and West (1986) found a strong effect from having *participated* in the arts as a child as being an influential variable on current arts demand.

We further observe that because economists often use secondary data, aesthetic taste – a non-observable, "soft" variable – is either left out or represented by proxies such as parents' education, general education, art-specific education, frequency of past consumption of cultural goods, active arts participation or other personal involvement (e.g. as a donor or as a family member of an artist) in one or more art forms. Even in the case of primary data

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collection, economists have been hesitant to measure aesthetic taste (or "cultural capital accumulation" or "taste stock") directly, and have therefore been unable to distinguish the effects of aesthetic taste on consumer behaviour from other variables such as habit or consumption of cultural goods for reasons of social signalling or distinction.

Taste changes are much harder to detect empirically than taste heterogeneity, since this requires panel data that is usually expensive and time-intense to obtain. Research on taste changes has thus been mainly theoretical or, if empirical, on an aggregate level.

Initial models of taste change, mostly termed "habit-formation models", did not specifically focus on arts consumption. They aimed to account for an inter-temporal positive correlation between past and current consumption by including a one-year lagged dependent variable as an explanatory variable (Houthakker and Taylor 1970; Goudriaan et al. 1983; Oteri and Trimarchi 1990; Krebs and Pommerehne 1995; Urrutiaguer 2002), which turned out to be positive and strongly significant.

Only little research has aimed to *explicitly* capture aesthetic taste (or related concepts). Three models of changing tastes have been developed specifically for arts consumption (Stigler and Becker 1977; McCain 1979; Levy-Garboua and Montmarquette 1996). Two papers specifically aim to capture cultural capital (Ateca-Amestoy 2008; Grisolía and Willis 2010). The following table summarizes the most important research conducted in regard to aesthetic taste measurement and its role in explaining consumer demand for artistic goods (Table 1).

				empirical research		
authors	year	name used for what we call 'aesthetic taste'	what their measure of 'aesthetic taste' is assumed to be or consist of	proxy measure used to measure 'aesthetic taste'	dependent variable	significance/ results
Stigler, Becker	1977	music human capital Smj	function of past experiences and other human capital variables such as education	N/A	N/A	N/A
McCain	1979	sensitivity variable βi	function of the consumer's experience with the goods	lagged one-year dependent variable	aggregate demand	significant
Levy-Garboua, Montmarquette	1995	subjective perceived quality-adjustment st of the good in question	influenced by intrinsic taste for theatre and level of familiarity with theatre	appreciation scores for writers, directors and actors, quality of the text; percentage of writers, actors and directors known	probability of attending a theatre play in the past 4 years	only one minor proxy significant
					frequency of theatre attendances in the past 4 years	some proxy measures significant
					attendance and frequency of theatre attendance in the past 12 months	several proxy measures significant
Ateca-Amestoy	2008	cultural capital	a personal resource accumulated by past consumption of cultural goods which makes individuals more productive in the fulfilment of their cultural needs	parents' formal education level, the respondent's formal education level, whether the respondent had taken theatre classes and whether the respondent is an actor	frequency of theatre attendance	inconclusive results
Grisolia & Willis	2010	cultural capital	decodification skills which comes from education and culture background	education, frequency of theatre visits, number of books read, frequency of cinema attendance	choice of artificial theatre play	highly significant effects of possessing cultural capital and having a preference for complex, more serious plays

Table 1: Research aiming to measure aesthetic taste and its effect on consumer demand for artistic goods

Summarizing the literature on aesthetic taste and its role in consumer demand for artistic goods we make the following observations:

(1) there is not a lot of research focusing on aesthetic taste and its role in consumer demand for artistic goods;

(2) most of the research conducted does not incorporate a theory of _aesthetic_ taste but stems from Bourdieu's concept of taste as social distinction, i.e. the sociological interpretation of taste, and not the original, aesthetic concept;

(3) only one study measures the effect of aesthetic taste on the choice of goods within a product category (i.e. whether aesthetic taste refinement leads to different goods being demanded rather than simply more), and this study uses artificially constructed rather than real goods (Grisolía and Willis 2010); and

(4) none of the studies specifically sets out to measure aesthetic taste directly.

A GENERAL MODEL OF AESTHETIC TASTE DEVELOPMENT AND CHOICE OF CULTURAL GOODS

Hutter and Shusterman (2006) point out that the divide between economic and aesthetic theory in the late 18th century became most apparent when economic theory started focusing on self-interested action, while aesthetic theory focused on disinterested contemplation. From then onwards the arts and artistic value have played an increasingly diminishing role in economic theory, being gradually replaced by the concept of utility and the need to satisfy one's desires with commodities purchased in the market. In the model and hypotheses to be developed here we attempt to reverse this divide somewhat, in that we aim to include aesthetic concepts into a utility-based framework.

Development of aesthetic taste

Stating a general indirect utility function, we assume

$$V_{ic}(s_{ic}, fam_{ic}, X_i, X_{Qc}, X_{Kc})$$

where V_{ic} is the utility of individual i for cultural good c, s_{ic} is the aesthetic taste individual *i* has developed for cultural good *c*, fam_{ic} denotes the familiarity of individual *i* with cultural good *c*, X_i are commonly used socio-demographic variables that are known to influence consumption of cultural good *c* such as age, gender, income and education, X_{Qc} are aesthetic qualities of cultural good *c*, and X_{Kc} are other, non-aesthetic attributes of cultural good *c*.

Following the extensive line of thought on taste in the philosophy of aesthetics and, in addition, drawing on research on perceptive expertise in psychology, we take as our starting point the concept of aesthetic taste as a perceptive skill. We formalize development of aesthetic taste in the following way:

$$s_{c_t} = s_{c_{t-1}} + rx_{c_{t-1}} \qquad (1)$$

where s_{c_t} denotes aesthetic taste *s* for cultural good *c* at time *t*, s_{c_t} is the value of aesthetic taste at time $t-1$, and $x_{c_{t-1}}$ is the experience with cultural good *c* at time $t-1$; r is the weight given to this latest experience with cultural good *c* in $t-1$, where $rx_{c_{t-1}}$ represents the increment in aesthetic taste in time t. The cultural good c here refers to a specific category of cultural goods, such as theatre plays, operas or paintings. Equation (1) follows Levy-Garbuoa and Montmarquette's (1996) notation, so that differences and similarities between the models developed previously and the approach taken here become obvious.

As Levy-Garbuoa and Montmarquette (henceforth LGM) note, in the case of beneficial addiction (a case in which cultural goods are considered to belong) in the rational addiction model of Stigler/Becker (1977), $r > 0 \; \forall \; x$, meaning that every consumption experience leads to an increase in s_c and henceforth an increase in utility for the quality-

adjusted quantity X in their model. The relationship between consumption experiences and utility is thus strictly positive. In their own learning-by-consuming model (Levy-Garboua and Montmarquette 1996) r is assumed to be stochastic, reflecting positive or negative surprises when consuming cultural good c, which LGM interpret as "discovering one's taste".

In our case of development of aesthetic taste, r is always assumed to be positive as well (as in the rational addiction model), since we assume that every exposure to a cultural good, contemplation of a cultural good, or information obtained in relation to a cultural good, is increasing the level of aesthetic taste for the cultural good c. Everyday experience of learning a skill, whether it be bike riding, wine tasting, observing birds or playing chess, tells us that every moment one spends contemplating, practising, discussing or reading about the activity in question either increases the skill or – if the information read or experience gained was repetitive or brief – leaves the level of our skill unchanged. One could argue that there exist situations where a perceptive skill might be "unlearned" or where r could be negative, namely when information obtained is incorrect. Examples for such situations would be when an aesthetic term is used in a situation where the aesthetic quality the term refers to is not actually present, or when knowledge obtained about a cultural good is wrong. The image of a wanna-be-art-aficionado comes to mind, that is, someone who uses aesthetic terms in a more or less random fashion to project a certain image of himself. Within this paper, we will not deal with the case of "misguided" aesthetic taste development but will remain with the assumption that all information obtained in the course of a consumption experience or learning experience with a cultural good is correct.

In their learning-by-consuming model, LGM interpret s_{c_t} in equation (1) as a subjective quality of the cultural good, and, in the case of theatre, assume it to be influenced by intrinsic taste for theatre on the one hand, and level of familiarity with theatre on the other. Having reviewed the literature on aesthetic taste development and cognitive expertise development, we define aesthetic taste s_{c_t} to be a function of two variables different from those in the LGM model: aesthetic language proficiency (the ability to describe an aesthetic

experience with specific words) about or in relation to cultural good c, denoted by L, and knowledge developed in relation to cultural good c, denoted by K. We can thus write:

$$s_c = g(L, K) \qquad\qquad (2)$$

In this paper, for reasons of simplicity, we will assume g to be a linear additive function; however, given the literature, we can suspect that interaction effects between L and K could be significant or it could be the case that K influences L. The investigation of interactive effects between L and K will be left for future research. Note that, contrary to LGM, we do not include familiarity in our formalisation of aesthetic taste, but retain it as a separate variable, distinct from aesthetic taste.

Having defined aesthetic taste s_c, for cultural good c, we can now turn to the question of how aesthetic taste development is expected to affect consumption choices for cultural goods, and what role aesthetic qualities of cultural goods play.

Rather than focusing one's interest on the quantity of cultural goods demanded, one can just as easily regard the process of consumer choice of a cultural good as being discrete: In a choice situation where a consumer chooses to attend a performance of theatre, dance, opera or music, she chooses one alternative out of a finite set of alternatives, since she can only attend one play or concert on one evening or see one exhibition in one afternoon. Treating the individual cultural goods on offer as alternatives, decision makers' choices among those alternatives can be described with discrete choice models (Train 2009). Random utility theory (RUT), being close to consumer theory and generally invoked in regard to choice models, assumes that people always select the alternative with the highest utility to them (i.e. they do in fact have consistent and transient preferences), but that variations in choice behaviour are due to the analyst not observing all the variables that influence behaviour.

Can aesthetic taste explain the taste acquisition phenomenon?

We start with a random utility model

$$U_c = V_c + \varepsilon_c \qquad (3)$$

where U_c is the utility of cultural good c, V_c is the systematic component of the utility function and ε_c are disturbances that are not observed by the researcher.

If we define a choice set C_{bin} consisting of only two alternatives; either to purchase a cultural good c or not (e.g. attend or not attend a theatre play or arts exhibition)

$$C_{bin,c} = \{buy_{yes,c}, buy_{no,c}\}$$

we can write the choice probability to purchase cultural good c as

$$P_n(buy_{yes,c}|C_{bin,c}) = \Pr[V_{buy_{yes,c}n} + \varepsilon_{buy_{yes,c}} \geq V_{buy_{no,c}n} + \varepsilon_{buy_{no,c}n}] \qquad (4)$$

Our first hypothesis will be formulated in regard to this average choice probability for cultural good c (for example, in the case of theatre plays this would be the average choice probability for all theatre plays, which is different from the choice probability for particular theatre plays).

The literature in aesthetics is rarely concerned with preferences or choices as such and thus cannot be drawn upon to develop hypotheses about the relationship between aesthetic taste development and utility or choices. Prior economic research on the effect of cultivation of taste or taste refinement (concepts related to aesthetic taste development) showed that there is a positive relationship between those concepts and demand. We thus expect the same to be true in the case of aesthetic taste in our data, namely that on average respondents with higher levels of aesthetic taste are more likely to purchase a ticket to a theatre play than people with low levels of aesthetic taste. The most important research, on which we base our hypothesis in regard to the relationship between aesthetic taste development and the probability to choose cultural good c, comes from psychology. Here research has found that perceptive expertise in the form of greater category structure increases utility (Redden 2008; Smallman and Roese 2008; Eisenstein 2010). Even though such research has focused on fields other than cultural goods, there is no reason to believe this link not to be true for cultural goods. We therefore formulate our first hypothesis:

H1: The average choice probability of purchasing a cultural good c, $P(buy_{yes,c}|C_{bin,c})$ increases with increasing aesthetic taste for that cultural good, s_c.

Stating H1 in other words, we expect the utility of purchasing a cultural good c to increase as aesthetic taste increases respective to all other goods. Note that this hypothesis refers to the whole cultural good category (or to the average cultural good c) but does not make any statements about preferences within the cultural good category. In the particular case of theatre, we would thus expect to see the average choice probability for purchasing a theatre ticket to increase as aesthetic taste increases, disregarding any particular attributes a theatre play might or might not have.

As mentioned earlier, in their cultivation-of-taste model, LGM define familiarity with a cultural good as one of the two variables affecting cultivation of taste for theatre (the other being innate taste for theatre). In contrast, we have defined aesthetic taste to be a function of aesthetic language proficiency and knowledge of the product category. Nevertheless, we also assume that familiarity with theatre will play a significant role in explaining the probability of going to the theatre, distinct from the role aesthetic taste plays. We define familiarity with a cultural good as a function of past experiences with cultural good c (number of theatre attendances in the past):

$$fam_c = h(att_{past}) \tag{5}$$

In a choice situation, where we define a binary choice set C_{bin} consisting of only two alternatives, either to purchase a cultural good c or not (e.g. attend or not attend a theatre play or arts exhibition)

$$C_{bin,c} = \{buy_{yes,c}, buy_{no,c}\}$$

and repeating equation (4):

$$P(buy_{yes,c}|C_{bin,c}) = \Pr[V_{buy_{yes,c}n} + \varepsilon_{buy_{yes,c}n} \geq V_{buy_{no,c}n} + \varepsilon_{buy_{no,c}n}] \tag{6}$$

we would therefore expect that:

H2: On average, familiarity with cultural good c increases the choice probability $P(buy_{yes,c}|C_{bin,c})$ of consuming a cultural good c, ceteris paribus.

Note that we have defined H2 in identical terms to H1, the only difference being that H1 concerns aesthetic taste, whilst H2 concerns familiarity. In other words, we expect both aesthetic taste for a cultural good and familiarity with a cultural good to have a positive effect on utility and therefore on probability of choice for the average cultural good.

Can aesthetic taste explain preference heterogeneity within a cultural good category?

We now turn to the second phenomena commonly observed among arts consumption – that some consumers look for an aesthetic experience and others for entertainment. Latour and Latour (2010) in their research on wine drinking behaviour distinguished two groups of wine consumers: one group with high levels of past exposure but low levels of aesthetic taste, whom they name "aficionado consumers", and another group who has high levels of past exposure *and* has developed aesthetic taste ("expert consumers"). There is no reason why we should not assume similar groups to exist for cultural consumption.

As economists looking at demand for cultural goods, we are interested in how aesthetic taste development influences this demand, and how aesthetic taste influences preferences for certain aesthetic qualities and thus for specific cultural goods within a cultural goods category. There is a dilemma here: aestheticians writing about (aesthetic) taste made a great effort to point out that judgments of (aesthetic) taste are *not* judgments of liking, the formation of which aestheticians have not speculated about. Individual preferences expressed through consumption choices made, however, *are* judgments of liking. We thus have no prior notion of whether consumers of cultural goods who have developed aesthetic taste have a positive or negative preference for a particular cultural

good possessing a particular aesthetic quality. The only inference that might be drawn from philosophy as to individual preferences for aesthetic qualities is one that addresses the aesthetic character of the cultural good as a whole, where "aesthetic character" denotes all the aesthetic qualities a cultural good possesses taken together. In a simplified formalisation, we can define

$$X_{Q_c} = f(a_{1c}, a_{2c}, a_{3c}, \dots, a_{Pc}) \tag{7}$$

where X_{Q_c} denotes the strength of the aesthetic character of cultural good c, and $a_1, a_2, \dots, a_P$ denote individual aesthetic qualities of cultural good c. This simplification allows us to include aesthetic qualities into the utility function as an aggregate rather than each individual aesthetic quality separately.

The systematic component of the utility function for cultural good c, V_c can now be further broken down into attributes of cultural goods, such that utility for cultural good c is defined in terms of the attributes it possesses:

$$V_c = \beta_{0c} + \beta_{Kc}h(X_{Kc}) + y_{Qc}p(X_{Qc}) \tag{8}$$

where β_{0c} is the alternative-specific constant of cultural good c, not associated with any of the observed attributes and capturing the average weight of unobserved sources of utility; β_{Kc} is a vector of parameters associated with a vector of observable attributes X_K of cultural good c. As we can see, there are K directly observable attributes entering the utility function for cultural good c, where the specific attributes depend on the type of cultural good investigated. Note that the functional form with which the attributes enter the utility function is not set *a priori*. In addition we define X_{Qc} as the attribute of cultural good c that captures the strength of the aesthetic character of cultural good c, and y_{Qc} as the parameter associated with this attribute.

The difference from other models developed by McCain (1979), Levy-Garbuoa and Montmarquette (1996) or Stigler and Becker (1977) is that the elements in the utility function are the attributes of the cultural goods rather than the number of (subjectively or objectively defined) goods consumed. The overall utility for a cultural good *i* for individual *n* depends on

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n's individual preferences for non-aesthetic characteristics *and* his preference for the presence of aesthetic qualities.

We can thus formulate a hypothesis in relation to cultural good consumption:

H3: Amongst others, we can distinguish two groups of consumers who differ in their preferences for cultural goods: consumers who have a high level of past exposure (familiarity) but low aesthetic taste (aficionado consumers), and consumers who have high levels of past exposure and high levels of aesthetic taste (expert consumers).

DESCRIPTION OF THE RESEARCH METHODOLOGY AND THE SURVEY INSTRUMENT

The hypotheses developed apply to all cultural goods. Within this paper, theatre plays have been chosen as the cultural goods category in which to test the hypotheses. Theatre plays form a category of cultural goods that has been well researched by other cultural economists, allowing for comparison of results. Data was collected via discrete choice experiment. The survey was carried out online and programmed using DISE (Schlereth and Skiera 2012). A major Australian panel provider was engaged to recruit participants for the survey who reside in Sydney, Australia. In addition, the sample was stratified by age according to the overall Sydney population aged 18 or older. To ensure a sufficiently high survey completion rate as well as a basic understanding of the theatre-going experience amongst survey respondents, we further restricted the population to people who had attended a theatre play in the past 12 months. Screener questions on the first screen of the survey ensured that respondents were in fact living in Sydney, aged 18 or older and had been to see a theatre play in the 12 months preceding the survey. Each respondent was rewarded with $3 for completing the survey. The survey was live from 15 August to 30 August 2012. In total, 479 respondents completed the main survey. Out of those, 73

respondents were deleted from the data, either because they had given random answers, several inconsistent answers or had answered the questionnaire too fast (under 7 minutes).

In addition to the discrete choice task, aesthetic taste was measured in two ways (see Appendix 1), and other socio-demographic information was captured about the respondents.

The plays used in the survey

In the online choice experiment respondents were asked to choose between theatre plays that were being staged in Sydney during a four-week window in September/ October 2012. The decision was made in favour of using real theatre plays and respective information about them. During the four-week window the complete choice set of theatre plays on offer in Sydney was 16. For each of the 16 plays the following information was gathered from the theatres' websites: title of the play, playwright, venue, aesthetic description of the play, plot, and price. All information was used in its original wording.

To ensure that each play was presented to respondents equally often and with each other play equally often, a Balanced Incomplete Block Design (BIBD) was used to combine the 16 plays into 20 choice sets, each containing four plays. In the discrete choice task respondents were shown 20 screens, each containing a choice set with information on four different plays. Every respondent was asked to answer all 20 choice sets. In each choice set respondents were asked to tick which one of the plays they preferred most, and which one they preferred least[1]. Below the choice set was another question that asked respondents whether they would buy a ticket to the play they ticked as most preferred above. Adding this option works similar to including a "none" alternative in a discrete choice experiment, in that we assume that "none" was chosen if the respondent ticked that he would not buy a ticket to the play he preferred most in that choice set. Since each choice set is understood to be an independent choice situation with only the four plays on offer (rather than all 16 plays), it is

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[1] Note that within this paper we only use information on the most preferred play.

necessary to asked this question in every choice set. The figure below shows a screenshot of one of the 20 choice sets used in the survey.

Which of the following theatre plays would you **most** like to see and which one **least** , if these four plays were the only ones offered and you had to pay for the ticket yourself?				
Title of the play	Water	Australia Day	The Sea Project	The Splinter
Playwright	Filter and David Farr	Jonathan Biggins	Elise Hearst	Hilary Bell
Venue	Sydney Theatre	Sydney Opera House	Griffin Theatre	The Wharf Theatre
Description	Water explores man's desire to push himself to the limits in an increasingly unstable world and asks whether people's inability to connect on a personal level could have potentially catastrophic repercussions on a global scale.	In a period when political correctness has overwhelmed us, the playwright's fearlessness is refreshing, but even when he is pointing out our ugliest features he does so with affection and quint-essentially Aussie good humour. A wickedly funny play.	The Sea Project is an evocative, unique story of migration, memory and desire. It's a joyous, poignant, and incredibly funny ride.	Inspired by the Henry James novel The Turn of the Screw and real life stories of abducted children, this work is an emotional thriller about all consuming obsession, grief, childhood and identity, a visually rich, image-based production.
Start of the plot	Spanning 26 years, two generations and two continents, ...	The small country town of Coriole. Does a sausage sizzle code as ...	Things are washing up on the shore: suitcases, spectacles, hair ...	A mother and father celebrate: Eliza has returned. ...
More plot (click grey bar to see)				
Price Adult/ Student/ Pensioner/ under 30	$75/$60/$60/$40	$85/ $70/ $70/$45	$30/ $23/ $26/$26	$75/ $60/ $60/$40
Prefer most	○	○	○	○
Prefer least	○	○	○	○
Would you buy a ticket for the play you ticked as most preferred above?				
○ yes				
○ no				

Figure 1: Screenshot of a choice set used in the survey

Measures of aesthetic taste

As mentioned before, we define aesthetic taste s_c for cultural good c as a function of two variables, proficiency of category-specific vocabulary (language) and general knowledge about the product category.

$$s_{c_t} = g(L, K)$$

In view of the importance of language in developing aesthetic taste, we thus assume that people with higher levels of aesthetic taste are able to use specific language to express their aesthetic perceptions in words and are, vice versa, also better able to understand such statements upon reading them. In addition to the choice experiment, respondents were asked to complete a survey component, where respondents' level of aesthetic vocabulary was assessed in two ways: directly, by asking respondents to reveal whether the meaning of a set of statements that people who presumably have high levels of aesthetic taste for theatre have made, was clear to them; and indirectly, by asking respondents how likely it is

that they would carry out activities that people who have developed aesthetic taste might do when attending a theatre play.

The level of an individual's theatre knowledge, the second component of aesthetic taste, was also assessed in two ways: directly, by asking respondents whether they knew or had had exposure to certain playwrights; and indirectly, by asking the respondents about how they themselves perceived their level of theatre knowledge.

Since both components of aesthetic taste, language and knowledge, were assessed directly and indirectly, we are able to construct two measures of aesthetic taste; one direct and one indirect. How these two measures of aesthetic taste were derived and the distribution of the variables amongst respondents is explained in Appendix 1.

RESULTS: TESTING THE HYPOTHESES

Aesthetic taste and the "taste acquisition" phenomenon: model results

To test H1 and H2 we can suppose that respondents were presented with only two choices in the choice sets: whether to purchase a ticket to a theatre play, or not. We make use of the fact that for each of the 20 choice sets respondents saw, they made two decisions – which of the four theatre plays given in the choice set they preferred most and whether they would *actually* buy a ticket to the play they ticked as most preferred. The latter decision only is of interest at the moment. We treat each of the choice sets respondents saw as independent choice decisions, which gives us 8120 observations (406 respondents * 20 choice sets).

Since we only have two choice outcomes in each choice set – whether a ticket to a theatre play would actually be purchased or not – we will estimate a binary conditional logit model. Economic analyses of theatre attendance often include socio-demographic variables other than aesthetic taste in demand models to explain heterogeneity of tastes, namely theatre attendance in the previous 12 months, theatre attendance as a child, gender, age,

education and income. For that reason the same variables will also be included here. We formulate the following utility difference function between the two alternatives (whether to purchase a theatre ticket or not):

$$\varDelta U = k_0 + k_1 aestaste + k_2 attpre18 + k_3 att12mths + k_4 female + k_5 age + k_6 educ + k_7 inc$$

where k_0 is the alternative-specific constant (essentially the mean utility) for the alternative to go to the theatre (decide to purchase one of the theatre tickets on offer in the choice set). Our interest at this stage is exclusively on the *average* probability of choosing or not choosing to go to see a theatre play, and we thus completely disregard any attributes of theatre plays. Since only differences in utility matter, it is common in choice models to define one alternative as the base alternative and set the coefficient of its utility function to zero, so that the coefficients of the utility functions of the other alternatives can be easily compared to the base. We will define the "not purchase ticket" alternative as the base alternative in all four models. The coefficients of the model thus have to be interpreted in terms of differences to this base alternative.

As mentioned earlier, we developed two different measures of aesthetic taste, a direct one and an indirect one. Two models will be estimated using the different measures of taste (Model 1 and Model 2). In addition, since the direct and indirect measures of taste are not highly correlated, we will estimate a third model that includes both direct and indirect measures of taste (Model 3). We will also estimate the model that only includes those socio-demographic variables conventionally used (Model 4):

$$\varDelta U = k_0 + k_2 attpre18 + k_3 att12mths + k_4 female + k_5 age + k_6 educ + k_7 inc$$

so that model performance can be compared. We also included $know_{fake}$, our measure of "yea-sayers"[2], in all the models to improve the quality of the utility coefficients. Table 2 shows the descriptive statistics for the independent variables used in the models:

variable name	variable type	min	max	mean	median	sd	proportion of respondents = 1
Direct measures of aesthetic taste							
taste_dir1	continuous	0.00	1.00	0.75	0.83	0.25	-
taste_dir2	continuous	0.00	1.00	0.42	0.39	0.26	-
Indirect measures of aesthetic taste							
taste_ind1	continuous	0.38	1.00	0.69	0.70	0.11	-
taste_ind2	continuous	0.01	1.00	0.51	0.50	0.16	-
taste_ind3	continuous	-0.22	1.00	0.41	0.38	0.20	-
Childhood exposure and past consumption							
attpre18_1	dummy	0	1	-	-	-	66.26
attpre18_2	dummy	0	1	-	-	-	27.09
att12mths_1	dummy	0	1	-	-	-	46.06
att12mths_2	dummy	0	1	-	-	-	13.05
Socio-demographic variables							
female	dummy	0	1	-	-	-	59.61
age_1	continuous	0.18	0.82	0.45	0.44	0.15	-
educ_1	dummy	0	1	-	-	-	32.76
educ_2	dummy	0	1	-	-	-	19.95
inc_1	dummy	0	1	-	-	-	23.4
inc_2	dummy	0	1	-	-	-	18.72
know_fake	dummy	0	1	-	-	-	21.92

Table 2: Descriptive statistics for the independent variables used in the models to test H1 and H2

Table 3 shows the results of the four different models estimated. All 406 respondents were included in the models, and the models all fit significantly better than a model without predictors (Prob>chi2 = 0). Coefficients significant at p>=0.1 are highlighted in bold[3]. Overall we can see that the model that does not include any measures of aesthetic taste has the

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[2] a variable capturing people who might have given incorrect answers in the survey

[3] Whilst it is common to exclude insignificant interactions from the analysis, we retained all variables in the models since every variable is at least significant in one of the models. This allows us to compare the overall model fit between the different models. Excluding one variable from a particular model would mean not being able to compare the model fit anymore, since models need to be nested in order to be able to compare them.

worst fit (Model 4), whereas Model 3, which includes both direct and indirect measures of aesthetic taste has the highest LL.

In general, a higher log likelihood indicates a better model fit; however, we need a test of whether a particular model is fitting the data significantly better than another model. To test whether the models with the higher log likelihood are significantly better, we perform likelihood ratio (L-ratio) tests. If the L-ratio test turns out to be significant, we can assume that the model to be tested fits the data significantly better than the conventional model. The L-ratio test assumes that one model is nested in the other, in which case the distribution is approximated by the χ^2-distribution. We use the conventional Model 4 as the base model and perform the L-ratio test for each of the other three models. The L-ratio test reveals whether these additional variables added in a model significantly improve the model fit. We calculated first the L-ratio between Model 1 and Model 4:

$$L - ratio_{1,4} = -2 \left(LL0 - LL1\right) = -2 \left((-5306.61) - (-5082.02)\right) = 449.19$$

where *LL0* is the LL of the base model (Model 4) and *LL1* the log likelihood of the model to be tested (Model 1). The L-ratio for Model 2 is 331.97, and for Model 3 it is 624.35. The L-ratio is χ^2-distributed and we can thus conclude that all models including variables measuring aesthetic taste (whether directly, indirectly or both), perform significantly better than the model excluding them. We can also compare Model 1 (base) against Model 3 which gives us a L-ratio of 175.16, and Model 2 (base) against Model 3 (L-ratio: 292.38), indicating that Model 3 performs better than the two models only using either the direct or indirect measure of aesthetic taste.

	Model 1		Model 2		Model		Model 4	
	including **only direct measures** of aesthetic taste		including **only indirect measures** of aesthetic taste		including **direct and indirect measures** of aesthetic taste		**without direct and indirect measures** of aesthetic taste	
number of observations	8120		8120		8120		8120	
Wald chi2	799.96		710.24		918.22		451.08	
Prob>chi2	0		0		0		0	
Log likelihood	-5082.02		-5140.63		-4994.44		-5306.61	
alternative 1: purchase ticket	Coefficient	z-statistic	Coefficient	z-statistic	Coefficient	z-statistic	Coefficient	z-statistic
taste_dir1	**1.25**	12.11	-	-	**0.72**	6.37	-	-
taste_dir2	**1.75**	13.25	-	-	**1.82**	13.56	-	-
taste_ind1	-	-	**3.49**	14.87	**2.48**	9.83	-	-
taste_ind2	-	-	**1.31**	8.44	**1.33**	8.35	-	-
taste_ind3	-	-	**0.29**	2.37	0.16	1.32	-	-
know_fake	-0.11	-1.48	**0.42**	6.58	**-0.18**	-2.31	**0.50**	8.27
attpre18_1	-0.03	-0.51	0.06	1.08	-0.05	-0.90	**0.13**	2.40
attpre18_2	**-0.25**	-4.06	**-0.12**	-1.93	**-0.25**	-4.01	-0.06	-1.07
att12mths_1	**0.32**	5.98	**0.37**	6.85	**0.26**	4.75	**0.50**	9.76
att12mths_2	**0.55**	6.17	**0.69**	7.56	**0.50**	5.39	**0.90**	10.59
female	0.06	1.18	0.08	1.56	0.02	0.34	**0.15**	2.97
age_1	**0.65**	3.77	**1.00**	5.87	**0.60**	3.42	**1.08**	6.49
educ_1	**0.29**	5.06	**0.38**	6.83	**0.31**	5.34	**0.37**	6.67
educ_2	0.07	1.08	**0.18**	2.62	0.08	1.21	**0.18**	2.72
inc_1	**0.37**	5.95	**0.36**	5.84	**0.38**	6.13	**0.31**	5.27
inc_2	**0.28**	4.06	**0.26**	3.84	**0.24**	3.42	**0.31**	4.61
constant	**-2.05**	-16.16	**-4.04**	-19.68	**-4.02**	-19.24	**-1.09**	-10.27
alternative 2: no purchase	base alternative		base alternative		base alternative		base alternative	

Table 3: Results of the binary logit choice models testing H1 and H2

Age is significant in all models, and this is consistent with prior literature. Being female does not affect the probability to purchase a theatre ticket. We included two dummies for education (Bachelor's degree and Postgraduate degree; base: no university education) and two dummies for income (high income, very high income; base: low-medium income) in all four models. The results are surprisingly consistent across the four models: *educ_1* (Bachelor's degree) has a significant effect with a similar coefficient in all four models, whereas *educ_2* (Postgraduate degree) has a small positive significant coefficient in two models. Income shows a consistent effect in all four models, namely that medium income has a positive significant effect on the probability to purchase a theatre ticket. This positive effect decreases somewhat as income increases.

Results for H1 and H2

Looking across all four models, *taste_dir1* and *taste_dir2*, the direct measures of aesthetic taste, are both positive and significant in the two models where we included them (Model 1 and Model 3). The indirect measures of aesthetic taste, *taste_ind1*, *taste_ind2* and *taste_ind3* are all significant and positive in Model 2. In Model 3 two out of the three indirect measures of aesthetic taste are significant and positive. In regard to testing H1, we thus find evidence that having aesthetic taste positively affects the probability of wanting to purchase a theatre ticket, independent of whether aesthetic taste is measured directly or indirectly.

The two dummies measuring exposure to the theatre in the past 12 months (*att12mths_1* and *att12mths_2*) are both significant and positive in all four models, although markedly smaller in the models that also contain measures of aesthetic taste. This indicates that past exposure in conventional models picks up some of the aesthetic taste effect (as a proxy variable) but that past exposure also has an effect over and above aesthetic taste development – a habit effect possibly – and that including direct and indirect measures of aesthetic taste helps in distinguishing these two effects. A real surprise is that we could not find a positive significant effect of childhood exposure in any of the models that account for aesthetic taste, but in fact, strong exposure as a child seems to have a small but significant *negative* effect on the probability to purchase a theatre ticket as an adult.

Aesthetic taste and general preference heterogeneity within a cultural goods category: Model results

Now we will start looking at the choice data as such rather than just at the binary decision of whether to purchase a ticket to a play. For the analysis, we set up the data in stacked format. Each respondent answered 20 choice sets, with each choice set consisting of 4 theatre plays where one had to be picked as most preferred, and the additional question "Would you actually buy the ticket you ticked as most preferred?" the answer to which we use as a fifth, the "none" alternative. If the respondent ticked "no" to the question, we

assume that the respondent chose not to purchase any ticket in the choice set. If she ticked yes, we use the actual response given (whichever play she chose in that choice set). We duplicate each observation (n=406) 100 times (20 choicesets * 5 alternatives), so that each respondent now has 100 rows in the dataset and the total dataset has 40,600 rows. Lastly, we will now test H3:

H3: Amongst others, we can distinguish two groups of consumers who differ in their preferences for cultural goods: consumers who have a high level of past exposure (familiarity) but low aesthetic taste (aficionado consumers), and consumers who have high levels of past exposure and high levels of aesthetic taste (expert consumers).

Latour and Latour (2010) investigate how far aficionado consumers and expert consumers differ in their abilities to correctly describe and detect a specific wine (perceptive abilities). We can test whether these two groups of consumers exist in our case for theatre, and how they differ in their consumption choices.

Methodology explained: Latent class analysis

To test H3, latent class analysis was chosen as the methodology to be employed. A latent class or finite mixture structure captures and accounts for preference heterogeneity amongst people, since it allows for the existence of latent classes with homogeneous tastes

(in the economic sense). Each class differs from the others with respect to the weights attributed to different variables in the utility function.

Latent GOLD Choice, the software used here to conduct the analysis, implements a nonparametric variant of the random-coefficient or mixed conditional logit model (Louviere et al. 2000; McFadden and Train 2000). Respondents expressed their preferences in 20 choice sets, which introduces dependence between the observations. This dependence makes it possible to estimate class-specific regression parameters. In addition a latent class model also allows us to predict class membership for an individual on the basis of the individual's characteristics.

The probability that individual *n* is in a particular latent class x is in our case dependent on those covariates that have already been used above to explain choice of theatre play in other choice models. To model class membership, a multinomial logit is specified in which class membership is regressed on covariates specified (Vermunt and Magidson 2005):

$$P_n(x|cov_n) = \frac{e^{G_{x|cov_n}}}{\sum_{x\prime=1}^{K} e^{G_{x\prime|cov_n}}}$$

where G_x is the class membership function specified as a linear function of the following individual's covariates:

$$G_{x|cov_n} = \gamma_{0x} + \gamma_{1x}taste_{dir1} + \gamma_{2x}taste_{dir2} + \gamma_{3x}taste_{ind1} + \gamma_{4x}taste_{ind2} + \gamma_{5x}taste_{ind3}$$
$$+ \gamma_{6x}know_{fake} + \gamma_{7x}attpre18_1 + \gamma_{8x}attpre18_2 + \gamma_{9x}att12mths_1$$
$$+ \gamma_{10x}att12mths_2 + \gamma_{11x}female + \gamma_{12x}age_1 + \gamma_{13x}educ_1 + \gamma_{14x}educ_2$$
$$+ \gamma_{15x}inc_1 + \gamma_{16x}inc_2$$

For identification purposes one class is set to 0 and the parameter estimates γ_{Hx} need to be interpreted with respect to that class.

The choice probability of alternative i is now conditional on n's class membership:

$$P_n(i|x) = \frac{e^{V_{i|x}}}{\sum_{j\in C_n} e^{V_{j|x}}}$$

where we specify the utility function for each class to be dependent on the observable attributes of the theatre plays as well as the measures of aesthetic qualities:

$$V_{i|x} = \delta_{0|x} + \delta_{1|x}gotheatre + \delta_{2|x}playwright + \delta_{3|x}thvenue + \delta_{4|x}tickprice + \delta_{5|x}romance$$
$$+ \delta_{6|x}catastrophic + \delta_{7|x}artistic + \delta_{8|x}critical + \delta_{9|x}comedic + \delta_{10|x}tragic$$
$$+ \delta_{11|x}psychol + \delta_{12|x}aesthetic$$

where aesthetic is a variable representing two measures of aesthetic qualities that were developed by the author based on the information about the plays and critics' reviews in newspapers. The choice probability of alternative i by individual n is thus the probability that individual n is in a particular latent class x (conditional on n's covariates) multiplied by the conditional probability of choosing alternative i, given that individual n is in this class, summed over all latent classes, where t are the 20 choice sets:

$$P_n(i) = \sum_{x=1}^{K} P(x|cov_n) \prod_{t=1}^{20} P(y_{nt}|x)$$

As compared to mixed logit models, latent class models are easier to understand, have greater practicability for developing policies (since covariates that are used to predict the latent classes make it easier to target specific groups of people), and can perform better statistically than mixed logit models (Grisolía and Willis 2012).

Results

Commonly used criteria for deciding on the right number of classes for a latent class model are the Bayesian Information Criterion (BIC) and the Akaike Information Criterion (AIC), where $BIC_{LL} = -2LL + \log(N)\,npar$ and $AIC_{LL} = -2LL + 2\,npar$. Effectively, the BIC penalises the number of parameters to be estimated more heavily than the AIC.

When estimating models with three and more classes, some model estimations using the expectation-maximisation algorithm in Latent Gold lead to non-convergence or reported different results, indicating several local maxima. As long as the BIC and AIC were lower for the k-class solution than the k-1-class solution, it did not matter whether the results were in

fact a local or global maximum, since assuming it to be a local maximum, the global maximum would only lead to a lower BIC and AIC. For the 7-class solution, estimation of the model showed that the BIC was higher than for the 6-class solution, indicating the best fit for the 6-class solution. To ensure a global maximum was reached, the 6- class model was estimated 100 times, each time using a random (i.e. different) seed for the starting values. The model with the lowest LL is assumed to have reached the global maximum on the LL function. The results reported in the following table are the results from the best model for each number of classes. The estimation results for all models can be found in Appendix 3.

# of classes	LL	BIC(LL)	AIC(LL)	AIC3(LL)	Npar	L²	df	p-value	Class.Err.	R²(0)	R²
1	-11588.7	23348.52	23215.48	23234.48	19	23177.4801	8101	7.5e-1428	0.00	0.10	0.02
2	-10928.2	22351.47	21966.35	22021.35	55	21856.3514	8065	6.0e-1252	0.11	0.29	0.22
3	-10640.3	22099.77	21462.58	21553.58	91	21280.5776	8029	2.9e-1181	0.09	0.29	0.22
4	-10344.1	21831.52	20942.25	21069.25	127	20688.2538	7993	3.0e-1109	0.03	0.23	0.15
5	-10094	21655.24	20513.9	20676.9	163	2.02E+04	7957	2.4e-1050	0.03	0.25	0.18
6	-9864.28	21519.98	20126.56	20325.56	199	19728.5608	7921	1.8e-997	0.03	0.27	0.20
7	-9754.89	21625.28	19979.79	20214.79	235	19509.7865	7885	3.3e-976	0.05	0.31	0.25

Table 4: Summary statistics for models with a different number of classes

As can be seen from Table 4, the AIC criterion is lower for the 7-class solution than for the 6-class solution, however, since it becomes increasingly more difficult to find global solutions as the number of latent classes increases and the results become increasingly difficult to interpret, a decision has been made to follow the BIC criterion – which is lowest for the 6-class solution – and take the results of the 6-class solution to be the best fitting model.

As measures of aesthetic qualities, we use *aestqual* (a binary variable whether a play conveys a strong aesthetic character or not) and four dummy variables that indicate strength of aesthetic character as assessed by theatre reviewers (*smh_stars1*, *smh_stars2*, *to_stars1*, *to_stars2*) jointly in the latent class model.

Table 5 shows the coefficients for the class membership function (insignificant coefficients in red) and Figure 2 displays significant coefficients of the membership likelihood function in a graph to facilitate interpretation.

	Class(1)	Class(2)	Class(3)	Class(4)	Class(5)	Class(6)
constant	0.00	77.77	-22.64	-18.89	46.13	9.24
taste_dir1	0.00	-99.40	-27.51	140.96	-34.87	-68.56
taste_dir2	0.00	-96.75	-26.53	-77.53	-72.21	1.10
know_fake(1)	0.00	-40.32	-125.54	-14.50	-17.07	-21.94
taste_ind1	0.00	80.28	40.63	-167.54	-38.27	-45.95
taste_ind2	0.00	-81.77	-31.22	-39.52	-3.74	-21.72
taste_ind3	0.00	-64.95	-17.53	21.00	-34.94	79.59
attpre18_1(1)	0.00	-2.98	8.93	28.05	3.57	48.81
attpre18_2(1)	0.00	31.40	5.55	-18.07	-107.99	26.06
att12mths_1(1)	0.00	21.65	6.38	32.26	4.22	-53.05
att12mths_2(1)	0.00	-5.93	58.13	34.70	61.92	5.42
female(1)	0.00	-15.98	7.62	-0.03	6.96	2.61
age_1	0.00	71.22	115.05	34.18	129.51	34.63
educ_1(1)	0.00	23.88	22.82	39.71	12.88	-5.24
educ_2(1)	0.00	29.44	37.09	53.87	50.91	0.13
inc_1(1)	0.00	-84.58	1.21	-17.16	-17.59	16.76
inc_2(1)	0.00	0.11	-14.99	-34.05	-45.76	-21.53
size of class (proportion)	0.1593	0.1012	0.3186	0.1373	0.2057	0.0779

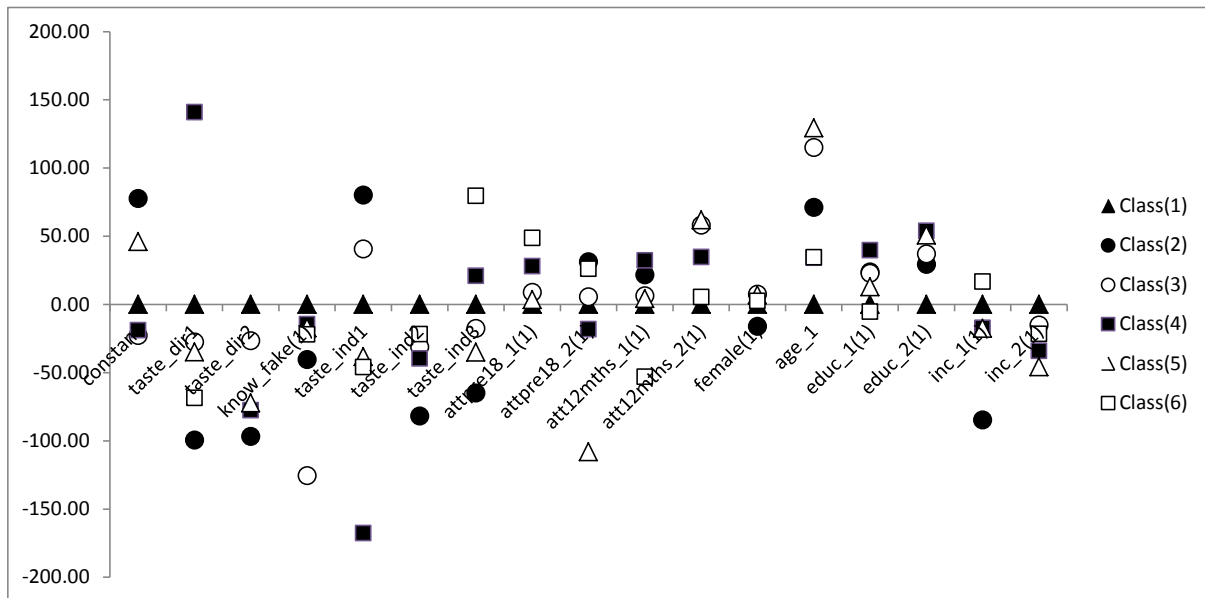**Table 5: Parameter estimates for the latent class membership function estimated to test H3**

Figure 2: Visual representation of the parameter estimates for the latent class membership functions estimated to test H3

The coefficients for the membership likelihood function of Class1 are set to zero, and all other coefficients need to be interpreted with respect to Class 1. We can, however, look at

the ranking of the classes with respect to the aesthetic taste and familiarity variables (Table 6).

	Class(1)	Class(2)	Class(3)	Class(4)	Class(5)	Class(6)
taste_dir1	high	low	medium	very high	medium	low
taste_dir2	high	low	high	medium	medium	n.s.
taste_ind1	medium	high	high	very low	medium	medium
taste_ind2	high	low	medium	medium	n.s.	medium
taste_ind3	medium	low	medium	medium	low	high
att12mths_1(1)	medium	high	medium	high	medium	low
att12mths_2(1)	low	n.s.	high	medium	high	low

Table 6: Simplified representation of the aesthetic taste and familiarity parameter estimates of the membership functions for the LC analysis conducted to test H3

Table 7 shows the coefficients for the utility function (again insignificant coefficients are displayed in red).

	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
gotheatre(1)	0.28	-2.38	-0.45	-1.46	-1.46	-17.56
playwright_1(1)	0.24	-1.55	-0.11	-0.13	-0.25	-3.43
playwright_2(1)	0.29	-1.93	0.66	0.32	-0.21	-11.24
thvenue_1(1)	0.02	-1.54	-0.04	-1.05	0.06	8.76
thvenue_2(1)	0.54	-1.67	0.69	-1.56	0.77	2.71
tickprice_1(1)	0.11	0.55	0.33	-0.22	-0.75	0.17
tickprice_2(1)	0.11	2.19	0.05	0.63	-0.44	-1.13
romance(1)	0.50	-1.60	0.60	0.60	0.50	6.23
catastrophic(1)	0.23	-4.35	-0.10	-0.19	1.04	3.30
artistic(1)	0.34	-1.14	0.34	1.20	0.95	7.28
critical(1)	-0.02	0.63	-0.12	0.02	-0.66	4.78
comedic(1)	-0.24	1.01	0.52	-0.09	-0.79	7.92
tragic(1)	0.09	-0.88	-0.41	1.00	-1.44	16.11
psychol(1)	0.10	2.11	-0.12	1.55	-0.40	5.40
smh_stars1(1)	0.01	2.52	0.32	1.41	-0.54	-12.08
smh_stars2(1)	-0.33	-3.28	-0.77	-2.08	-1.40	-8.15
to_stars1(1)	-0.09	-0.75	-0.18	-0.65	-0.68	-3.29
to_stars2(1)	-0.24	-0.81	0.22	0.39	0.73	5.05
aestqual(1)	-0.18	2.70	-0.26	-0.31	-0.95	-10.63
size	0.16	0.10	0.32	0.14	0.21	0.08
choose 'none'	0.12	0.90	0.22	0.44	0.65	0.73

Table 7: Parameter estimates for the utility functions for the six classes estimated to test H3

On average respondents chose the "none" alternative in 43 percent of choice sets. Class 1 on average chose the "none" alternative only in 12 percent of choice sets. Of all classes respondents in this class are the youngest, have the lowest education and the highest income (note the oddity). In addition, 87 percent of respondents in this class claim to know the fake playwright. These results alone make the answers given by respondents in this class highly questionable and we thus term them "random clickers" since we suspect that they either did not genuinely answer the questions asked or randomly clicked through the survey. This suspicion is further confirmed by the fact that in their utility function, few parameter estimates are significant, as compared to the other classes.

Class 2 is quite a small class (ten percent of respondents), and has the highest proportion who chose the "none" alternative (90 percent of times). These respondents are essentially not interested in theatre plays. The fact that most of their choices were "none" makes it difficult to produce reliable parameter estimates for their utility function, since effectively, on average we only have two choice sets per person where the "none" alternative was not chosen, i.e. where the attributes of the theatre plays were not zero. The results for levels of aesthetic taste of respondents in this class are contradictory. They have the lowest level of aesthetic taste according to the direct measures of aesthetic taste, but the highest level according to *taste_ind1*, which makes us suspect that the quality of responses delivered by those respondents is also poor, possibly because theatre plays are simply "not their thing".

Class 3 is the largest class with 32 percent of all respondents belonging to this class. Respondents belonging to this class are older, have a medium probability of having a Bachelor or Postgraduate degree, but quite a high probability to have a high income (assuming that Class 1 is an invalid class, Class 3 would be the most affluent). They have a high probability of having attended theatre plays frequently in the past 12 months, and have high levels in all measures of aesthetic taste. Since they have both exposure and aesthetic taste, they would classify as "expert consumers" in the terminology of Latour and Latour

(2010). In terms of their choices, this class is quite likely to go to the theatre (only in 22 percent of choice sets the "none" alternative was selected), they have a positive preference for well-known playwrights and venues, medium-priced theatre tickets and plays that are comedic.

It is quite surprising that Class 3, supposedly the "expert consumers" class, is also the largest class found. The author suspects that in fact this class contains two groups of respondents: on the one hand the *true* expert consumers, and on the other hand more mainstream consumers, which also explains why the coefficients for aesthetic qualities are quite weak. Given that 3 classes found in this analysis are either non-goers or have provided unreliable data (Class 1, Class 2, and Class 6), it is not surprising that Latent Gold has not separated out these two groups of consumers.

Class 4 prefers plays that are staged in small, rather unknown venues, and have a preference for plays that are introspective into the human psyche, are tragic or somehow relate to an artistic topic. In terms of aesthetic qualities, some of the parameters are either not significant (*aestqual*, *to_stars2*), and others (*smh_stars1* and *smh_stars2*) are inverted, which could be interpreted as respondents in this class being anti-establishment. People in this class are quite young, well-educated but on the lower side of the income distribution. They have the highest level of *taste_dir1* indicating that they are confident with aesthetic statements made in "theatre speak". On the other hand, they have by far the lowest value of *taste_ind1*. In terms of past attendance, they have attended theatre plays in the previous 12 months at least occasionally. A possible interpretation could be the following: this group of people is in fact involved in the arts and has high levels of aesthetic taste, but are interested in quite a niche offering of plays – the ones that are not regarded as aesthetically rewarding by "the establishment" (that is, the likes of the Sydney Morning Herald, a highly regarded newspaper) – but offer experiential rewards, such as being tragic, psychologically introspective and experimental (staged in a smaller venue). The author suspects that the very low levels of *taste_ind1* is due to the fact that these respondents – who are presumably

more experiential and "artsy" – were somewhat offended by the questions that aimed to measure the usage of aesthetic terms by asking them to respond to statements like "I am capable of perceiving aesthetic qualities of theatre plays" or "I am good at describing with words the aesthetic experience I have when attending a play". Taking this interpretation further, one could speculate that to people in this class, going to the theatre is to a great degree a mysterious, sacred experience that should not be analysed or measured.

Members of Class 5, the oldest class, are highly educated but have low income. They have the highest familiarity with theatre plays (in terms of past attendance in the previous 12 months) and have medium levels of aesthetic taste. In regard to their preferences for theatre plays, they are selective about which plays to attend, choosing the "none" alternative 65 percent of times. This is the only class with a negative coefficient for price. Their choice probability increases if the play is set in a well-known venue such as the Sydney Theatre Company or the Sydney Opera House and if it makes reference to a romance, a catastrophic event or has an artistic element in its story line, but decreases if a play has tragic, comedic or critical elements.

In regard to aesthetic qualities, Class 5 follows *Timeout* magazine's reviewers' star ratings, but has negative coefficients for *aestqual* and *smh_stars1* and *smh_star2*, which would indicate a taste for entertaining plays (if our suspicion is correct that *Timeout* magazine review reflect entertainment value). This class could potentially be interpreted as Latour and Latour's aficionado consumers.

With only 8 percent of respondents, Class 6 is the smallest class. Respondents in this class have a higher than average proportion of not attending a theatre play (73 percent of choice sets). Being a small group (eight percent of respondents) and having a large proportion of choice sets where "none" was chosen, leads to the data having only little variance (similar to Class 2) and the coefficients of the utility function unreliable. Respondents in this class are quite young and most of them have had at least some exposure to theatre plays before they turned 18, but they are not likely to have attended

theatre plays in the previous 12 months. The coefficients for their utility function are considerably more extreme than for all other classes. This is possibly due to the fact that some alternatives in a choice set were never chosen by respondents in this group. One of the outputs Latent Gold provides is a calculation of the choice probabilities for each class and each alternative in every choice set (not provided in this paper). Class 6 is the only class that contains choice probabilities for alternatives that are 0. Therefore we do not pay too much attention to the coefficients of the utility function.

We can summarize the six classes found in Table 8:

	Class name	percent of respondents
Class 1	random clickers	16
Class 2	not interested in theatre plays	10
Class 3	mainstream consumers + expert consumers	32
Class 4	artsy, experimental consumers	14
Class 5	aficionado consumers	21
Class 6	rare attenders	8

Table 8: The six classes found in the latent class analysis of theatre play choice

In regard to H3, our data gives some evidence for the existence of expert consumers who have developed aesthetic taste *and* have high levels of familiarity (Class 3), and aficionado consumers who have low levels of aesthetic taste but also high levels of familiarity (Class 5).

It is common in Latent Class Models to calculate the willingness-to-pay for each class and each attribute by calculating the ratio between the coefficient of an attribute and the price coefficient (Scarpa and Thiene 2005; Choi 2009; Grisolía and Willis 2012). We do not have a continuous price variable in our model , however, we are interested in the ratio between the attribute *thvenue_2* (for which the coefficients are similar between Class 3 and Class5) and the different attributes indicating an aesthetically rewarding play (*smh_stars2, to_stars2, aestqual*). We would expect those classes with high levels of aesthetic taste (Class3) to have higher ratios than those with low levels of aesthetic taste (Class5).

	Class 3	Class 5
coefficients		
thvenue_2(1)	0.69	0.77
smh_stars2(1)	-0.77	-1.40
to_stars2(1)	0.22	0.73
aestqual(1)	-0.26	-0.95
ratios		
smh_stars2/thvenue_2	-1.12	-1.81
to_stars2/thvenue_2	0.32	0.95
aestqual/thvenue_2	-0.38	-1.23

Calculating the ratio between smh_stars2 and thvenue_2 (well-known theatre venue), we can observe that Class 3 (the class that is assumed to contain expert consumers) has a higher ratio of -1.12 than Class 5 (-1.81). The same is true for the ratio of aestqual and thvenue_2 (-0.38 for Class 3 and -1.23 for Class 5). The results thus indicate that Class 3 are more inclined than Class 5 to prefer plays with strong aesthetic qualities. For the ratio to_stars2 to thvenue_2, Class 5 has the higher ratio with 0.95 as compared to the one for Class 3 (0.32). As mentioned earlier, we assume that the Sydney Morning Herald is the more reliable source for aesthetic qualities than the *Timeout* magazine.

Although these results are broadly in support of H3, we would have expected to see a more specific difference between Class 3 and Class 5. The number of expert consumers is rather small in the general population and also amongst theatre patrons. Our sample has been drawn from the general population, so the number of expert consumers in the sample of 406 respondents is most likely very small. This could be one explanation for why our model can only faintly distinguish this group of consumers in our data. It can be expected that when repeating this DCE with a sample of theatre-goers (e.g. by distributing links to the survey amongst patrons at one or more theatre venues), expert consumers will be much more easily distinguishable from aficionado consumers.

One aim of this paper was defined as testing whether the philosophical concept of aesthetic taste can capture the "taste acquisition" phenomenon sufficiently and as a concept distinct from past exposure, and therefore provide more specific information to policy makers and arts organisations as to how to engage people in cultural goods consumption.

Two hypotheses were formulated specifically in regard to the taste acquisition phenomenon, H1 and H2. The two hypotheses state that aesthetic taste for a cultural good (H1) and familiarity with a cultural good (H2) increase the choice probability for that cultural good. In other words, it was hypothesized that both aesthetic taste and familiarity independently increase the likelihood of people choosing to go to the theatre rather than not.

To test the hypotheses, a discrete choice experiment of theatre plays was conducted online and answers from a sample of 406 respondents were obtained. Binary conditional logit models were conducted to test H1 and H2: Model 1 including only direct measures of aesthetic taste; Model 2 including only indirect measures of aesthetic taste; Model 3 including direct and indirect measures of aesthetic taste; and Model 4 not including any measures of aesthetic taste (Model 4 being the conventional model of demand for cultural goods). Apart from the different aesthetic taste variables, socio-demographic variables commonly used in empirical studies of demand for cultural goods were included in all four models: childhood attendance; attendance in the past 12 months; age; gender; level of education; and level of income. The results showed that those models where aesthetic taste was explicitly included (Models 1-3) perform significantly better than the model that does not include any measure of aesthetic taste (Model 4), in support of H1. In regard to H2, we found that in all four models familiarity has significant and positive coefficients. We can thus conclude that aesthetic taste and familiarity have distinct positive effects on the probability to consume a cultural good. Interestingly though, the coefficients for past exposure are much smaller in those models where measures of aesthetic taste were included, as compared to in

the model where they were not included. This implies that only including past exposure in a model for consumer demand for cultural goods captures some of the taste acquisition phenomenon, but by no means captures all of it.

With respect to the taste acquisition phenomenon, we can thus conclude the following: measuring aesthetic taste as a function of general knowledge of the cultural goods category and of an individual's comprehension of aesthetic language allows for the capturing of the effect of taste acquisition. This effect of taste acquisition is distinct from any effect familiarity with the cultural good (i.e. past exposure) might have, such as cultural goods consumption as a habit or an activity signaling social prestige.

For economic analysis of demand for cultural goods our results imply that including only proxies such as past exposure; education; or social status does not sufficiently capture the taste acquisition phenomenon. Economic studies of arts demand often are performed on secondary data that have not been collected specifically for the purpose of the analysis, but rather by an arts organisation over the years, or by a public entity (e.g. Census). Variables that could potentially represent aesthetic taste are generally not captured in such data sets and, as a consequence, aesthetic taste cannot be adequately integrated into the economic model under consideration. Such general studies of arts demand definitely have their use; however, the results presented here have shown that aesthetic taste is different from those variables commonly found in secondary data sets, and plays an essential role in explaining demand for cultural goods. We therefore suggest that, where possible, those general demand analyses should be supplemented with analyses on primary data, collected from a small sample that also includes measures of aesthetic taste.

Whilst exposure certainly is a necessary condition for developing aesthetic taste (how could one possibly understand theatre plays without attending them?), it is not sufficient to create longer-lasting future demand. Arts organisations such as theatre companies wishing to expand demand for their product should therefore focus their promotional efforts not only on attracting people to come and see plays, as they currently do

(for example through price-promotions; or staging plays or shows that attract audiences that generally would not consider going to the theatre, e.g. a play about a sports celebrity), but also on activities that promote the development of aesthetic taste amongst audience members.

The second phenomenon mentioned in the introduction of this paper referred to demand patterns within a cultural goods category. It can generally be observed that goods with strong aesthetic character are not the ones most frequently demanded, but rather that demand tends to follow those goods that are considered most entertaining.

The third hypothesis was formulated with respect to the consumption of cultural goods that have specific attributes (for example goods with strong aesthetic character or goods that are entertaining) and thus directly relate to the second phenomenon of aesthetically rewarding cultural goods not being the most popular. H3 tests for the existence of two particular types of consumers of cultural goods, namely those that have a high level of past exposure but have not developed aesthetic taste (presumably because their experiences with the cultural good lacked the reflection and discussion necessary for aesthetic taste to develop), i.e. the so-called "aficionado consumers", and a second group of consumers who also have a high level of past exposure and, in addition, have developed aesthetic taste, "expert consumers".

As mentioned earlier, the DCE was conducted by providing respondents with information about *real* theatre plays, where each theatre play formed one alternative. The consequence of doing so was that we did not have any pre-defined attributes and therefore the alternatives were not "attribute-combinations" as they commonly are in DCE. To test H3, however, measures of "strength of aesthetic character" were needed. For that reason the decision was made to "post-define" attributes, by coding each of the theatre plays on a set of attributes. With respect to "strength of aesthetic character", we drew on the literature in aesthetics and developed two alternative measures; one based on the intensity of the aesthetic language used in the description of the plays, and one based on critics' reviews.

To test H3 we conducted a latent class analysis and a 6-class solution was found to be the best fitting model, using the BIC criterion. Three of the classes found were only of minor interest: Class 1 (random clickers), Class 2 (respondents in this class are not interested in theatre plays), and Class 6 (smallest class with low average choice probability – most likely respondents in this class choose to attend only one or two of the plays on offer). Class 3 was the largest class, and we suspect that this class contained in fact two groups of consumers: the "expert consumers" we were looking for (who have a high level of past attendance and high levels of aesthetic taste), as well as more mainstream consumers. Class 4 contained "artsy" respondents, who prefer experimental, serious plays and presumably are offended by the attempt to measure aesthetic taste. Class 5 can be interpreted as "aficionado consumers", since respondents in this class have high levels of past exposure but only medium levels of aesthetic taste. We thus conclude that there is some evidence, albeit weak, in support of H3. In terms of the preferences of the two groups, we find that the expert consumers (Class 3) preferred plays with above average star rating by the *Sydney Morning Herald* and above average aesthetic qualities (*aestqual*), whereas preferences of "aficionado consumers" (Class 5) were more in line with the star rating of *Timeout* magazine. These results also support H3, since it was the "expert consumers" who preferred those plays that have a stronger aesthetic character, whereas "aficionado consumers" (who also have high levels of past exposure) preferred plays with a weaker aesthetic character.

These results once again show that developing aesthetic taste is indeed distinct from pure exposure (familiarity) and that preferences change in favour of plays with a stronger aesthetic character, as aesthetic taste is developed. With respect to the second phenomenon, that the goods highest in demand within a cultural goods category are generally not those that are most entertaining rather than those that promise the best aesthetic experience, we conclude that aesthetic taste does indeed explain this

phenomenon broadly, since testing the hypothesis has shown that developing aesthetic taste leads to greater preference for plays with a stronger aesthetic character.

Economists are concerned with true preferences and if one lacks a skill to understand (and therefore enjoy) aesthetic goods, a person's revealed preferences do not reflect their true preferences. Whilst some consumers of cultural goods might always look only for distraction and entertainment in their consumption activity, others might simply not be aware of aesthetic qualities, and would in fact be open to developing aesthetic taste; not accounting for aesthetic taste fails to distinguish between these consumers.

Arts organisations such as theatres need to be aware of the likelihood that two distinct groups exist amongst their frequent consumers: aficionado consumers who presumably choose those plays that are more easily accessible and entertaining, but do not provide such a high aesthetic experience; and expert consumers, who also are open to plays with stronger aesthetic qualities. Aesthetically rewarding plays require more skill from consumers (higher levels of aesthetic taste), but also offer greater aesthetic reward. Theatre companies can make use of this relationship between "more cognitive effort" and "more aesthetic reward", for example by offering existing "aficionado consumers" opportunities to learn (to develop aesthetic taste) via encounters with critics, educational sessions or discussion before/after the actual consumption situation, as described above. Not only would such activities lead to "more bums on empty seats" in aesthetically more challenging plays, but it would also allow companies to offer a wider variety of plays which in due course would lead to greater cultural capital being developed.

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APPENDIX 1: HOW THE MEASURES OF AESTHETIC TASTE FOR THEATRE WERE CALCULATED

The following sections will explain the alternative variables constructed to measure aesthetic taste in detail.
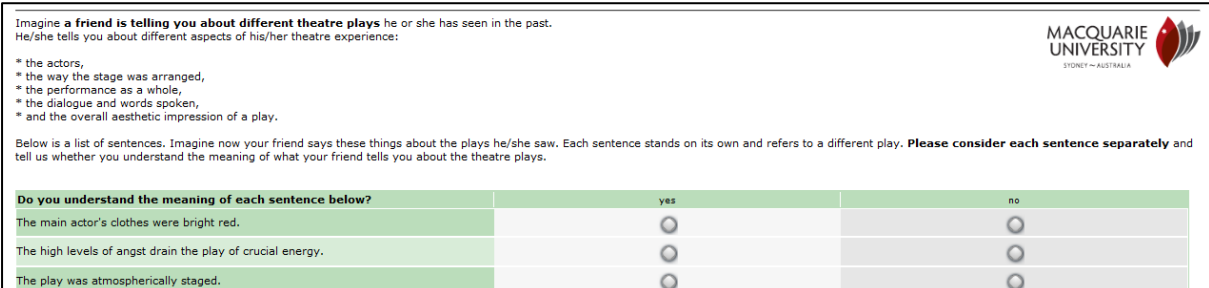
Direct assessment of aesthetic taste

The two variables influencing aesthetic taste, aesthetic language proficiency and general knowledge of theatre, were assessed separately.

Direct assessment of aesthetic vocabulary

We assume that people with developed aesthetic taste who have developed a specific vocabulary on how to express their experiences, not only understand statements of a descriptive nature made about theatre plays in everyday language, but also comprehend statements that aim to capture the aesthetic nature of the plays, as commonly found in critics' reviews. It is thus assumed that people do not differ in how well they understand generic, descriptive statements made about plays but that they do differ in how well they understand aesthetic statements made about theatre plays. The more developed one's aesthetic taste for theatre is, the greater is the likelihood that one can comprehend aesthetic statements.

Seven descriptive statements were generated, referring to generic characteristics of a theatre experience. In addition, 12 aesthetic statements were generated. All survey respondents were shown all 19 statements and asked whether they understood the meaning of each of them. Figure 3 shows a screenshot of part of the question.

Figure 3: Screenshot of direct taste assessment question

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The seven descriptive statements are statements whose validity can be easily observed by anyone, regardless of whether the person has had any exposure to or knowledge of theatre. Table 9 shows the seven descriptive statements used in the survey and for each descriptive statement the number of respondents who understood its meaning. On average, 89.4 percent of respondents understood the meaning of a descriptive statement.

Descriptive statements	Number of respondents who understood meaning of the statement *(in percent, n=406 respondents)*
The main actor's clothes were bright red.	84.0
The play was set in summer time, 1950s Ireland.	87.9
The actors all wore pink wigs.	83.0
The set changed quite often.	93.4
In total, at least 30 actors were in the play.	91.9
They play went for nearly two hours.	93.6
The stage was brightly lit all the time.	92.1

Table 9: Percent of respondents who understood the meaning of each descriptive statement

Overall, the large majority of respondents, 74.9 percent, understood all or nearly all descriptive statements (see Table 10). On average, respondents understood 6.3 descriptive statements (median=7 statements).

Number of descriptive statements	Number of respondents who understood certain number of descriptive statements *(in percent, n=406 respondents)*
0	1.5
1	1.5
2	2.2
3	3.5
4	4.2
5	5.2
6	7.1
7	74.9
Total	100.0

Table 10: Percent of respondents who understood a certain number of descriptive statements

The other 12 statements were aesthetic in their nature and used to assess aesthetic taste directly. They are shortened and slightly adapted versions of sentences from actual theatre reviews taken from widely available newspapers in Australia, the UK and the US. Table 11 shows that the number of people who understood each aesthetic statement varies. On average, 74.9 percent of respondents understood the meaning of an aesthetic statement, a surprisingly large number.

Aesthetic statements	Number of respondents who understood meaning of the statement *(in percent, n=406 respondents)*
The high levels of angst drain the play of crucial energy.	60.1
The play was atmospherically staged.	77.3
The play was clunking with inconsistent characterization and force-fed symbolism.	53.0
The acting was consistently honest.	85.7
The playwright's dialogue was rich, poetic, young, personal.	88.9
The play manages to be remarkably credible and rich in its portrait of the characters.	88.4
The play was preachy and slow.	81.8
There was robustness, even viciousness, to the way the play was written.	72.2
The storytelling was remarkably disciplined.	83.0
Toward the end, the energy started to sag and easier choices emerged.	64.5
There was a real fearlessness to the acting and writing.	81.3
In some moments the play feels like an illusion conjured from smoke and sadness.	63.1

Table 11: Percent of respondents who understood the meaning of each aesthetic statement

In contrast to the descriptive statements, respondents understood the meaning of fewer of the aesthetic statements (Table 12). On average respondents understood 8.99 statements (equivalent to 5.3 descriptive statements), with a median of 10 statements (equivalent to 5.8 descriptive statements).

Number of aesthetic statements	Number of respondents who understood a certain number of aesthetic statements *(in percent, n=406 respondents)*
0	1.5
1	1.2
2	1.5
3	1.7
4	4.2
5	4.7
6	4.9
7	7.4
8	9.1
9	10.6
10	11.6
11	15.0
12	26.6
Total	100.0

Table 12: Percent of respondents who understood a certain number of aesthetic statements

In the survey the statements were not marked as either descriptive or aesthetic, but presented in random order as "sentences a friend might tell you about different theatre plays he or she has seen in the past". For 24.9 percent of respondents all descriptive and aesthetic statements were clear. This quite large group of "yea-sayers" will have to be accounted for in the subsequent analysis.

Whilst only about a quarter of respondents understood all aesthetic statements, compared with three-quarters of respondents who understood all descriptive statements, the high number of respondents who understood all aesthetic statements is still surprising and could be due to several reasons: (a) online surveys are susceptible to people simply clicking "yes" without having read the statements properly, particularly if there is a lot of text to read as was the case with the 19 statements that were presented on two pages; (b) people know

that the statements are "theatre-speak" and like to think they do understand them when in fact they do not.

Nevertheless, we use the proportion of aesthetic statements that is clear to a respondent as a direct measure of aesthetic language proficiency: one of the two components influencing aesthetic taste:

$$taste_{dir_1} = \frac{m_n}{12}$$

where *m* is the number of aesthetic statements that were clear to respondent *n* and 12 was the number of aesthetic statements presented to respondents. Table 13 and Figure 4 show the descriptive statistics and frequency distribution for m[4].

	Min	Max	Mean	Median	Std. Dev.
m	0	12	9.0	10	3.0

Table 13: Descriptive statistics of the direct aesthetic taste component $taste_{dir_1}$ measuring aesthetic language proficiency
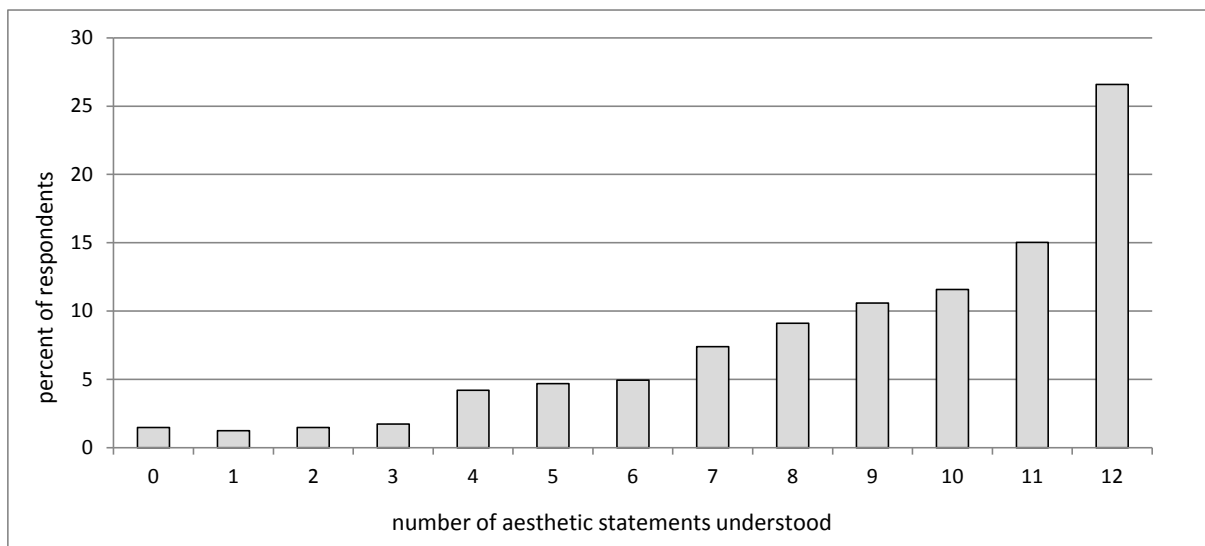

Figure 4: Frequency distribution of the direct aesthetic taste component $taste_{dir_1}$ measuring aesthetic language proficiency

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[4] The decision was made to present the descriptive statistics and frequency distribution for m rather than for $taste_{dir_1}$ since it is intuitively easier to understand and the two variables are 100 percent correlated.

Checking for yea-sayers

In order to check for yea-sayers, in addition to the 19 statements above approximately half of the respondents also saw two nonsense statements (Table 14) that were phrased in a similar way to aesthetic statements but contained words that are generally not used in a theatre context.

Nonsense statements	Number of respondents who understood meaning of the statement *(in percent, n=208 respondents)*
There was profound milkiness to the performance.	34.6
The playwright's dialogue was sky-coloured and wavy.	27.9

Table 14: Nonsense statements

Out of the 208 respondents who were shown the nonsense statements, 24.0 percent understood at least one of the nonsense statements and 19.2 percent understood both nonsense statements, which shows that in fact there were many yea-sayers answering this part of the survey. In fact, out of the 55 respondents who indicated that they understood all 12 aesthetic statements and had seen the nonsense statements, 43 percent also indicated that they understood both nonsense statements. Since these nonsense statements were only shown to half of the respondents, regrettably we cannot use this question to exclude yea-sayers from the survey and can only use the information for interpreting the results. It can be noted, however, that upon repeating such an assessment of aesthetic taste, it is advisable to include such nonsense statements to test for yea-sayers for all respondents.

Direct assessment of theatre knowledge

In the survey, respondents were also shown a list of playwrights and asked whether they knew some of the playwrights' work, whether they had heard the playwrights' name before or whether the playwrights were totally unknown to them. The list contained seven renowned playwrights, the 16 playwrights who had written the plays used in the survey, and one fake playwright to check for yea-sayers. Table 15 shows for every famous playwright the proportion of respondents who indicated that they know some of the playwright's work, that

they have at least heard the playwright's name before, or the name is totally unknown to them. Table 16 contains the 16 playwrights of the plays used in the survey and their respective popularity amongst respondents.

(in percent, n=406 respondents)	I know some of the playwright's work	I have heard the playwright's name before	Totally unknown to me	Total
Tennessee Williams	50.7	33.0	16.3	100.0
David Williamson	39.0	24.9	36.0	100.0
William Shakespeare	85.2	9.1	5.7	100.0
Bertholt Brecht	20.9	18.5	60.6	100.0
Henrik Ibsen	26.4	16.5	57.1	100.0
Arthur Miller	47.3	24.1	28.6	100.0
Andrew Upton	26.6	37.2	36.2	100.0
Mean	**42.3**	**23.3**	**34.3**	100.0

Table 15: Percent of respondents who are familiar with selected renowned playwrights

(in percent, n=406 respondents)	I know some of the playwright's work	I have heard the playwright's name before	Totally unknown to me	Total
Jonathan Biggins	10.0	31.8	58.4	100.0
Ian Meadows	3.9	20.0	76.1	100.0
Elise Hearst	5.0	17.5	77.6	100.0
DBC Pierre	5.9	17.7	76.4	100.0
Dan Giovannoni	12.1	25.4	62.6	100.0
Jeffrey Hatcher	9.1	28.6	62.3	100.0
Mirra Todd	3.2	17.0	79.8	100.0
Hilary Bell	9.0	25.9	65.5	100.0
Laura Eason	5.0	15.8	78.8	100.0
Tim Winton	34.2	28.3	37.4	100.0
David Farr	4.9	25.4	69.7	100.0
Jackie Smith	4.7	15.8	79.6	100.0
Noël Coward	43.4	21.7	35.0	100.0
Toby Schmitz	6.2	16.0	77.8	100.0
Chris Aronsten	2.7	16.5	80.8	100.0
John Logan	4.9	16.0	79.1	100.0

We can use the number of playwrights known to a particular respondent as a direct measure of respondents' theatre knowledge. Since knowledge of a playwright was assessed on a 3-point scale (familiar with the playwright's work; heard of the name of the playwright before; totally unfamiliar), two potential direct measures of theatre knowledge can be constructed: (a) the number of playwrights whose work a respondent knows; and (b) the number of playwrights whose name a respondent is *either* familiar with *or* whose work he or she knows. A decision was made for option (b)[5]. We use the proportion of playwrights a respondent claims to have heard of or knows the work of as a direct measure of general theatre knowledge, the second component influencing aesthetic taste:

$$taste_{dir_2} = \frac{pw_{heard_n}}{23}$$

where pw_{heard_n} is the number of playwrights that respondent *n* claims to have heard of or knows the work of, and 23 is the number of playwrights presented to respondents.

Table 17 shows the descriptive statistics of pw_{heard} and Figure 5 shows the frequency distribution[6].

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[5] Note that we also pursued option (a) and constructed a variable $taste_{dir_{2*}}$ that equalled the proportion of playwrights whose work a respondent knows as an alternative measure of the knowledge component of aesthetic taste. $taste_{dir_{2*}}$ has a mean of 4.60, a median of 4 and a standard deviation of 3.68. Early analysis revealed that $taste_{dir_{2*}}$ performed poorly compared to $taste_{dir_2}$ presented here, and thus a decision was made in favour of $taste_{dir_2}$.

[6] The decision was made to present the descriptive statistics and frequency distribution for pw_{heard} rather than for $taste_{dir_2}$ since it is intuitively easier to understand and the two variables are 100 percent correlated.

	Min	Max	Mean	Median	Std. Dev.
pw_{heard}	0	23	9.6	9	5.9

Table 17: Descriptive statistics of the direct aesthetic taste component $taste_{dir_2}$, measuring general theatre knowledge
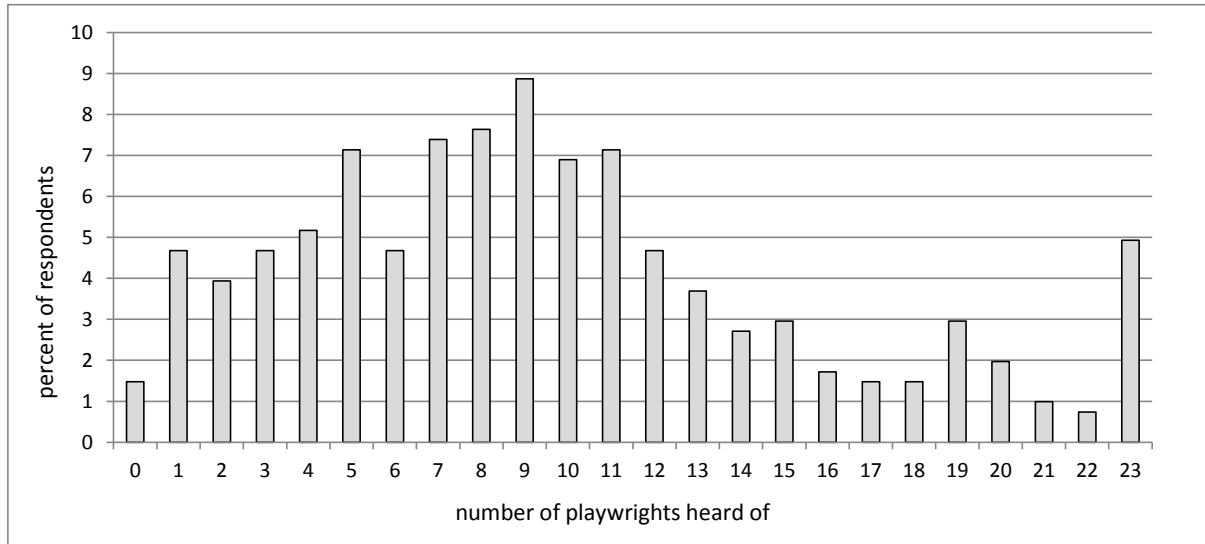

Figure 5: Frequency distribution of $taste_{dir_2}$, the knowledge component of the direct measure of aesthetic taste

The list of playwrights presented to respondents also contained one fake playwright (Table 18) to enable us to create a variable that identifies respondents who are untruthful about their theatre knowledge or click the same answer every time ($know_{fake}$). Luckily, unlike with the nonsense statements, the fake playwright was included in the survey for all respondents and can thus be used as a variable in further analyses. The spike at the end of the frequency distribution of $taste_{dir_2}$ (Figure 5) is well explained by this variable: Out of the 20 respondents who ticked that they know or at least have heard of all 23 playwrights, 19 have also heard of the fake playwright.

(in percent, n=406 respondents)	I know some of the playwright's work	I have heard the playwright's name before	Totally unknown to me	Total
Brooke Hackett	3.0	18.7	78.1	100.0

Table 18: Percent of respondents who are familiar with the fake playwright

Indirect assessment of aesthetic taste

The survey also asked respondents to assess their own level of aesthetic vocabulary proficiency (see Table 19) and their own level of general theatre knowledge (Table 20) as they perceive it on a 5-point Likert scale by agreeing or disagreeing with a set of statements.

One of the seven statements capturing aesthetic language proficiency, the one labelled *aest1*, is the most general, since it only says that "there is more to the experience of attending a theatre play than what you can see or hear" but it doesn't actually say what this "more" is. Over 87 percent of respondents agree with this statement. The statements *aest2 – aest5* capture more specifically the aesthetic aspect of theatre attendance and whilst the number of respondents disagreeing with these statements is still very low, the number of respondents who are uncertain (and ticked "neither") increases considerably. *aest6* and *aest7* specifically target the language aspect of aesthetic taste, namely that people who have developed aesthetic taste can express their aesthetic experience in words. As can be seen from Table 19, the number of respondents who are uncertain or who disagree increases even further. Nevertheless, around half of respondents still agree or strongly agree with *aest6* and *aest7*; an extraordinarily high number.

Name	Statement	Strongly agree	Agree	Neither	Disagree	Strongly disagree	Total
aest1	There is more to the experience of attending a theatre play than what you can see and hear.	29.6	57.4	10.3	2.7	0.0	100.0
aest2	When attending a play I pick up subtle details that are not directly observable.	8.9	56.4	30.3	4.2	0.3	100.0
aest3	I am capable of perceiving aesthetic qualities of theatre plays.	12.3	56.4	28.6	2.5	0.3	100.0
aest4	When attending a play I actively interpret and analyse the impressions I get.	15.8	53.9	23.4	6.7	0.3	100.0
aest5	I can easily recall theatre plays I have attended in terms of how I experienced them.	16.0	58.4	20.0	5.4	0.3	100.0
aest6	I am good at describing with words the aesthetic experience I have when attending a play.	8.6	39.7	37.2	14.3	0.3	100.0

aest7	I would use terms such as graceful, dynamic or awe-inspiring in describing a theatre play to a friend.	10.3	41.6	27.3	19.0	1.7	100.0

Table 19: Frequency distribution of the seve statements respondents answered to self-assess their aesthetic language proficiency (in percent, n=406 respondents)

In contrast, in regard to their personal general knowledge about theatre, respondents are much less confident. Only 30 percent of respondents agree that they "know a lot of theatre plays", and only 20 percent agree that they "know a lot of history of theatre".

Name	Statement	Strongly agree	Agree	Neither	Disagree	Strongly disagree	Total
know1	I know a lot of theatre plays.	3.9	25.9	43.4	25.1	1.7	100.0
know2	I know a lot about the history of theatre.	3.2	16.5	38.7	34.7	6.9	100.0

Table 20: Frequency distribution of the two statements respondents answered to self-assess their level of general theatre knowledge

Table 21 displays pairwise correlation coefficients between the aesthetic language proficiency and general theatre knowledge statements. All significant correlation coefficients (.01 level) are starred.

	aest1	aest2	aest3	aest4	aest5	aest6	aest7	know1	know2
aest1	1								
aest2	0.3789*	1							
aest3	0.3417*	0.4919*	1						
aest4	0.3816*	0.4172*	0.5654*	1					
aest5	0.3520*	0.3292*	0.4318*	0.4304*	1				
aest6	0.2682*	0.4341*	0.4800*	0.4611*	0.4281*	1			
aest7	0.2437*	0.3967*	0.4032*	0.3729*	0.3207*	0.5063*	1		
know1	0.0951	0.3475*	0.4044*	0.3815*	0.3272*	0.5066*	0.3776*	1	
know2	0.1198	0.3258*	0.4010*	0.3440*	0.3237*	0.4852*	0.3698*	0.7058*	1

Table 21: Correlation coefficients between statements assessing aesthetic language proficiency and general theatre knowledge, significant correlations (.01 level) are starred

The intention is to use the responses to the aesthetic language proficiency and general theatre knowledge statements in further analysis to explain respondents' choices of

theatre tickets. For that reason we aim to summarize and reduce the information contained in the nine variables to fewer variables that are uncorrelated.

The method of principal component analysis (PCA) is the most appropriate technique to use for our purposes. Principal component analysis takes the total variance of all variables entering the analysis and partitions it by first finding the (unique) linear combination of the variables called component that accounts for the maximum amount of total variance:

$$y_1 = a_{11}x_1 + a_{12}x_2 + \cdots + a_{1p}x_p$$

where x are the variables entering the analysis, y_1 is the first principal component, and a_{1i} are the coefficients of the first principal component. The procedure then finds a second linear combination, uncorrelated with the first component, that accounts for the second-largest amount of variance left, and proceeds in the same manner to determine as many components as there are variables in the analysis (in our case 9) where all components are orthogonal to each other.

Some might question why we decided to use PCA rather than factor analysis, another common technique for data reduction. Unlike PCA, factor analysis is an estimation method (it has no unique solution) and it requires some level of knowledge on how many factors are to be extracted. It is generally used to detect underlying structure (latent constructs), whereas PCA is the preferred method for data reduction (Mazzocchi 2008, p. 230). In our case, we do not have any preconceived notion about different latent constructs of aesthetic taste and are more interested in reducing the number of variables.

The statements are measured on the same Likert scale. We thus base the PCA on the covariance matrix rather than the correlation matrix (Mazzocchi 2008, p. 233), in which case greater differences in the usage of the scale are weighted higher than smaller differences. Table 22 shows the eigenvalues and amount of variance explained by each of the components.

| | Eigenvalue | Variance explained | |
		Proportion	Cumulative
Comp1	2.79	0.47	0.47
Comp2	0.78	0.13	0.60
Comp3	0.58	0.10	0.70
Comp4	0.37	0.06	0.76
Comp5	0.34	0.06	0.82
Comp6	0.33	0.06	0.88
Comp7	0.28	0.05	0.93
Comp8	0.23	0.04	0.97
Comp9	0.21	0.03	1.00

Table 22: Eigenvalues and amount of variance explained by each of the components obtained from PCA.

As expected, the first component explains the greatest amount of variance (47 percent), followed by the second component (13 percent) and so on. Since our aim is to summarize the information contained in the nine variables in fewer components, we need to decide on how many components to retain for further analysis. Kaiser's rule (Kaiser 1960) on eigenvalues suggests to retain only those components whose eigenvalues are greater than the average eigenvalue. In our case the average eigenvalue is 0.66 which would lead us to retain only two components. Note, however, that the third component with an eigenvalue of 0.58 is quite close to this threshold. A second way to determine the number of components is to examine the scree plot of eigenvalues (Figure 6). In this case, the number of components retained is determined by the point in the plot where the steep descent levels off (Cattell 1966), which can be found at three components. Alternatively, one could interpret the scree plot as only indicating one important eigenvalue. A third method to determine the number of components to retain for further analysis is to decide on the amount of total variance that the researcher wants to have explained by the retained components. A level of 70 percent of variance seems to be a common minimum threshold (Stevens 2002, p.390; Mazzocchi 2008, p.234), which would lead us to retain three components.
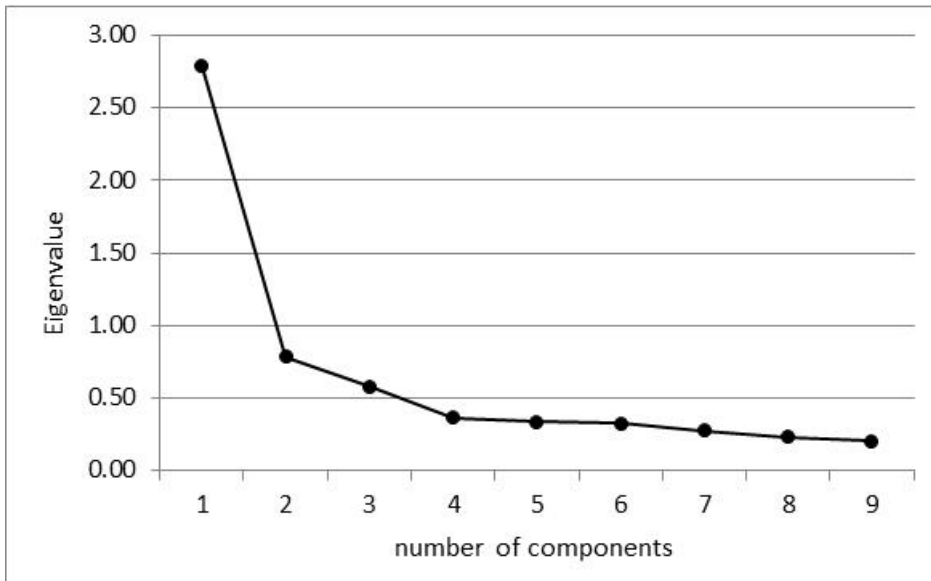
Figure 6: Scree plot of eigenvalues of all components of the PCA

Retaining only two components, as the Kaiser's rule would suggest, would leave us with only 60 percent of the total variance explained which is quite low. We thus decide to retain three components. Literature suggests the minimum threshold of 70 percent of variance should be explained by the retained components. In addition, the eigenvalue of the third component (0.58) is very close to the threshold suggested by Kaiser (0.66).

The components can be interpreted using the component-variable correlations, also referred to as component loadings (Table 23). Interpreting the three components, it seems that component 1 captures aesthetic taste in general, since all variables included in the PCA load positively and in roughly equal amounts on this component. In contrast, component 2 is characterized by the positive values of *aest1-5* and by the negative values of know1 and know2, leading us to think of this component as a "sensual experience" component where knowledge and adequate vocabulary do not play any or even a negative role, but variables capturing the experiential aspect of theatre-going are positive. The third component is dominated by a negative load of *aest7*, the statement that gives examples of the usage of aesthetic language.

	Comp1	Comp2	Comp3	Unexplained variance
aest1	0.17	0.44	0.23	0.22
aest2	0.26	0.20	0.06	0.26
aest3	0.29	0.17	0.18	0.20
aest4	0.33	0.28	0.30	0.22
aest5	0.28	0.22	0.28	0.28
aest6	0.40	0.02	-0.08	0.28
aest7	0.41	0.19	-0.84	0.03
know1	0.38	-0.49	0.11	0.14
know2	0.41	-0.57	0.13	0.12

Table 23: Component loadings and unexplained variance

We then compute the component scores for each respondent and each of the three components to use in subsequent analysis. We divide each of the three components by its respective maximum value, so as to restrict the variables' values to between 0 and 1 to facilitate interpretation in subsequent analysis, and name the three resulting variables $taste_{ind_1}$, $taste_{ind_2}$ and $taste_{ind_3}$. The sub-fix "ind" refers to the indirect (self) way of aesthetic taste assessment.

Correlations between direct and indirect measures of aesthetic taste and theatre knowledge

As explained above, $taste_{ind_1}$ is the first component derived from the PCA of indirect measures of aesthetic taste. It measures a general positive level of aesthetic taste (language proficiency and knowledge). This is also reflected in the correlation table below (Table 24), where $taste_{ind_1}$ is significantly positively correlated with $taste_{dir_1}$, the direct measure of aesthetic language proficiency, and $taste_{dir_2}$, the direct measure of general theatre knowledge. Interestingly, though, $taste_{ind_2}$ and $taste_{ind_3}$ only show very low correlations with the two direct measures of aesthetic taste, which might indicate that they pick up some aspects that have not been captured in the direct assessment. We also note that $taste_{dir_1}$ is significantly but not strongly correlated with $taste_{dir_2}$.

	$taste_{dir_1}$	$taste_{dir_2}$	$taste_{ind_1}$	$taste_{ind_2}$	$taste_{ind_3}$
$taste_{dir_1}$	1.00				
$taste_{dir_2}$	0.33	1.00			
$taste_{ind_1}$	0.44	0.32	1.00		
$taste_{ind_2}$	0.13	-0.14	0.00	1.00	
$taste_{ind_3}$	0.05	0.01	0.00	0.00	1.00

Table 24: Correlation between direct and indirect measures of aesthetic taste

Childhood exposure and past consumption of theatre

The frequency with which a person has consumed a cultural good in the past has been often used to explain current demand, serving as proxy for familiarity with the cultural good or habitual consumption behaviour. Two questions aimed to capture respondents' childhood exposure and past consumption of theatre plays respectively. Childhood exposure was captured by asking respondents for the number of times they had attended the theatre before they turned 18. Past consumption was captured by asking respondents how many times they had attended the theatre in the past 12 months. Table 25 shows the descriptive statistics. One respondent's answer to *attpre18* was obviously wrong (1,234) and thus replaced with the mean of the *attpre18*.

Name	Question	Min	Max	Mean	Median	SD
attpre18	In total, can you guess how many times approximately you have been to the theatre to see a play BEFORE you turned 18?	0	100	6.58	3.00	11.80
att12mths	In total, how many times in the last 12 months have you roughly attended a theatre play?	0	25	2.57	2.00	2.64

Table 25: Respondents' past theatre consumption

We would like to include responses of *attpre18* and *att12mths* as measures of childhood exposure and past consumption in subsequent analysis. However, we assume that respondents do not exactly remember the number of times they have attended a theatre play before they turned 18 years of age, or even within the last 12 months. For that reason

we proceed with caution and refrain from using the variables as continuous, but instead

generate four dummy variables to be used in subsequent analysis:

Variable name	Description	Proportion of respondents = 0	Proportion of respondents = 1
attpre18_1	=1 if respondent has attended 2-6 theatre plays < 18 years of age	33.8	66.3
attpre18_2	=1 if respondent has attended 7 or more theatre plays < 18 years of age	72.9	27.1
att12mths_1	=1 if respondent has attended 2-4 theatre plays in the past 12 months	53.9	46.1
att12mths_2	=1 if respondent has attended 5 or more theatre plays in the past 12 months	87.0	13.1

Table 26: Dummy variables created for childhood exposure and past consumption

Note that the author also checked correlations between the continuous versions of

attpre18 and *att12mths* as well as correlations between the two variables and the different

measures of aesthetic taste. As Table 27 shows, most correlations are significant but none

are high.

	att12mths	attpre18
att12mths		
attpre18	0.31	
taste_ind1	0.26	0.17
taste_ind2	-0.18	-0.12
taste_ind3	0.10	0.00
taste_dir1	0.16	0.16
taste_dir2	0.26	0.15

Table 27: Correlation coefficients between attpre18, att12mths and different measures of aesthetic taste

Socio-demographic variables

The survey also asked respondents about their gender, age, highest education completed, and level of income. Table 28 shows the details.

Gender (in percent, n=406 respondents)	
Female	59.6
Male	40.4
Total	100.00
Age (in years)	
Mean	44.5
Median	44
Min	18
Max	82
Highest education completed (in percent, n=406)	
Junior secondary school	3.9
Senior secondary or equivalent	17.2
Post-secondary diploma, certificate	26.1
Bachelor's degree	32.8
Postgraduate degree	20.0
Total	100.0
Gross personal income (in percent, n=406 respondents)	
Less than $1,000 per week (less than $52,000 per year)	38.4
$1,000 - $1,599 per week ($52,000 - $83,199 per year)	23.4
$1,600 or more per week ($83,200 or more per year)	18.7
Prefer not to say	19.5
Total	100.0

Table 28: Socio-demographic information about the survey respondents