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Large scale analysis on visual perception of love amongst individualistic and collectivistic cultures

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Abstract

Current research for brand love lacks an exploratory view on connecting the framework of interpersonal love and love towards products and brands. In an analysis of twenty thousand online generated images from individualistic and collectivistic cultures, differences in the expression of love are researched. Combined statistically aesthetic and content analysis reveal that collectivistic cultures on average uses brighter images with less contrast. Individualistic cultures represent love more frequently using images with two persons, almost thrice as much as the collectivistic counterpart. Furthermore, collectivistic culture expresses love using significantly more objects than the individualistic culture does.

Executive Summary

This executive summary is divided into three parts, in correspondence with the original report: it starts with the theoretical background, continues by elaborating the methodology and finishes by presenting the conclusions found.

Background

Current research for brand love lacks an exploratory view on connecting the framework of interpersonal love and love towards products and brands. There exist many concepts to describe the constructs and dynamics of interpersonal love. Consumer research about passion and love towards brands and products have attempted to describe relationships with known marketing indicators like for instance word of mouth. Whereas the interpersonal frames do extend over multiple cultural dimensions, the product and brand love tend to stay within the western consumption boundaries. If the definition of interpersonal love is dependent on the cultural dimension individualism, the definitions of brand love and product love might be turn out to be dependent on degree of collectivism as well. How does the definition of love and its expression change over different cultures? More specifically, how do consumers perceive and express love towards brands and products in collectivistic and individualistic context?

The popular frameworks of interpersonal love come from psychology and relate love by balancing constructs. One of these frameworks is based on the constructs passion, love and intimacy. Combinations of these constructs yield different forms of love like passionate love, romantic love, parental love and soforth. Passion is related to self esteem, and self-actualisation, whereas commitment is the intention to maintain the existing love. Intimacy comes from emotional investment in the relationship.

When it comes to love toward brands and products, there are many different ways to evoke brand and product love. Whereas some products are loved because of practical utility, others are loved because of it enables social interactions, and others are loved purely for aesthetic reasons. Inability to practically or cognitively interact with an object makes it impossible to love it. Consumers tend to extend themselves with consumption, which can be supported by brand love or product love. The most loved objects and brands are the ones that enable self actualization. Brand love is influenced through the role assigned to others in the definition of the self, or degree of collectivism in cultural context. In passion, commitment and intimacy can be found influences from the relation others are

defined to have with respect to the self. For this reason the interactions and message content that evoke brand love, constructed out of passion, commitment and intimacy, is a function of degree of individualism.

The definition of individualism is defined by the constructs autonomy, privacy, and self development. These constructs have their influence on the construction of love, in which passion seems to be sharing the self development or self actualization with the cultural context of individualism. Where the collectivist tends to commonly share the favorable attributes, trades and desires, the individualist tends to not include these constructs into the self, but to builds its own associations that are not shared in group. Where the individualist uses the others to benchmark, the collectivist uses others to extend the definition of the self.

Brand love is influenced through the role assigned to others in the definition of the self, or degree of collectivism in cultural context. In passion, commitment and intimacy can be found influences from the relation others are defined to have with respect to the self. For this reason the interactions and message content that evoke brand love, constructed out of passion, commitment and intimacy, is a function of degree of individualism.

Passion is a state of intense longing for union with the other, in which the border between the self and the other in cognitive sense is a function of collectivism. In collectivism, the identity, values and beliefs are a shared part of the self identity, whereas the individualist includes only the products of these social values and beliefs as to be included into the self identity. Moreover, the individualist recognizes himself to be the source of these values. In other words, both cultures might in the end share the same values and beliefs. The fundamental difference is to whom the origin of these values and beliefs are addressed. The individualist will incorporate the values and beliefs independently of its social context into the self, regarding them as a correctly evaluated product of its social context. The collectivist will take possibly the exact same values but attributes them coming directly from its social surrounding, thereby assigning the origin to be correctly evaluated and shared by its social surrounding. Commitment is the decision to invest in a loving relationship, not the degree of moral obligation one feels towards maintaining the loving relationship. In collectivistic societies a relationship groups like family are more determining in creation of values and maintaining them, which therefore influences the natural level of commitment towards relationships, as a larger part of the self identity is dependent on these relationships.

Intimacy through emotions in collectivism are more grounded in assessment of social worth and of shifts in relative social worth. Interpersonal intimacy in individualism is sometimes hard to evoke, since the striving for intimacy can reduce the personal control, which leads to internal conflict. This conflict might not occur when considering intimacy towards a brand or object, since the consumer is in control over the intimacy it receives. Integration into the self in an individualistic context requires creation, physical incorporation, cognitive operation, boundary breaking experiences and or investiture. This also holds for a collective context, the circumstances that lead to these processes in both cultural contexts are however different, for the relation between the self and the social surrounding is different in both cultural stereotypes.

Physical or cognitive interaction with the object or brand enables experiencing feelings of love. The conditions under which cognitive interaction is best evoked is culturally dependent, since messages are perceived with more and less regard to the message context in collectivistic and individualistic cultures respectively. Furthermore, brands that offer more symbolic benefits over utilitarian of hedonic ones, are distinguished by consumers, in which the most positively perceived brands are the ones that govern self expression, at least in an individualistic cultural context. As holds for cognitive interaction, self expression is similarly dependent on degree of collectivism, both in the content as in its appearance. In other words, where self expression might be equally important in collectivistic cultures, one will not recognize self expression having a similar practical form, neither having the same content, as the identity of self is constructed differently.

Many researches on the concept of love have been researched using respondents belonging to predominantly individualistic cultures. Upon regarding the constructs of love used to describe the phenomena, one might conclude that these constructs are at least partly influenced by the cultural dimension of collectivism, since the constructs involve the perception of the self as an individual as a part of groups and society.

Methodology

This research tries to answer this question in a partly new way of approaching culture on a large scale. An exploratory research is performed in an attempt to discover patterns that might couple the interpersonal framework amongst cultures to the existing framework of product and brand love. In total twenty thousand images from a public online image data base is used. All of these images are tagged with the word *love*, where for every targeted culture the word love is translated into native

language. The image sets come from three individualistic range of users, and one collectivistic range of users, mainly belonging to the eastern-Asian culture (mainly Japan and China). The individualistic range are English speaking users, Dutch and Hungarian users. The differences are analyzed in aesthetic sense and in content sense. Descriptive statistics about image brightness, color tone and saturation and content analysis on amount of persons, appearing objects and social situation are gathered and tested for significance.

In an electronically resembled image, every pixel is represented by three color values (the so called *color channels*) and the respective position in two dimensions. Combining the color values in every pixel and displaying all pixels at their respective allocated position, a representation of an image is constructed using, just as with stock prices, numbers.

In order to bypass the challenge of understanding pixel values and doing research on large image databases, a new method is presented. This method uses visual *features* (a feature is computable with algorithms) to visually represent images. Instead of using the traditional representation of data, this method allows showing the actual images plot-wise. Where one normally represents a data point by a dot or point, the data points in this *imageplot* are the actual images, showed on the respective coordinates in the plot. The data represented by the axes are free to choose and one can therefore see the relation between for instance the average saturation and the average brightness of a set of images in a scatterplot, whilst seeing the actual images in the scatterplot. This method allows an exploratory research on visual trends and patterns, for not disregarding the actual content of the image. Since the human is able to understand and perceive images in a much wider perspective than algorithms can at the moment, this way of resembling image sets is promising.

A sample of about ten thousand Instagram images hashtagged with the translation of *love* is used. After having stored the set of pictures, an automated feature based image analysis will start. This automated feature based analysis has to be performed on both set of images in the data set. The first image is opened and all the pixel values of the image are stored. The procedure of computing the median and standard deviation for a feature is repeated for the whole image set. The data set is stored sorted by filename of image, image available metadata, feature median and feature standard deviation. The context analysis will focus on several criterion, like the amount of people on a picture, whether the image refers to non-human content, subdivided into the categories like landscape, animals, plants. Furthermore, social roles will be analysed: work life, leisure or family role patterns are

subject of research. A count for amount of persons per image is performed on 200 images per set, thereby attempting to provide an indication the whole data set. The selected set is then considered as a new dataset and the procedure of generating the imageplots is repeated for the random sample, accompanied by the data representing the amount of persons in the picture. In other words, the random sample is taken used to understand if the amount of persons depicted in the images is dependent on cultural context. Context analysis is used to acquire an increased understanding of this culture.

Results

As the image database from the two differing cultural backgrounds shows differences in aesthetic constants in communicating love, it shows that the perception of love is possibly partly determined by a difference in generic aesthetic features like brightness, saturation and hue. It is found that the collectivistic culture uses a larger range of brightness, which proves the visual representation to be brighter. Moreover, the standard deviation of the brightness in collectivistic cultures is lower, which shows that on average these images have a lower contrast than the individualistically generated images. Moreover the saturation on average is lower in the collectivistic culture than in the individualistic, whereas the standard deviation of the saturation is equal in both cultures. For the hue or color tone, it can be concluded that the color tone use on average is different between the collectivistic and individualistic. The standard deviation turns out to be close to equal.

The content analysis overall shows some clear differences. The collectivistic user seems to use more frequently objects and less frequently animals than the individualistic user does. Moreover, leisure is equally frequently used to communicate the concept of love, whereas in general many more images depicting two persons are generated and consumed by individualistic users. Moreover family situations are much more frequently used in public visual communication by individualistic culture. The discussion about the actual expression of the definition of love might actually be more thoroughly understood when recalling the difference between individualism and collectivism. Where individualism is partly characterised by privacy, the more frequent appearance of family might reveal a different definition or need for privacy between both cultures. Apparently the high public online exposure of family situations is not limited by feelings of privacy in the individualistic culture, which might as well indirectly state the opposite about collectivistic culture. The more similar both cultural stereotypes desire to publically express family situations, the more this dataset directly expresses the

differently perceived definition of privacy between the two stereotypes instead of an actual difference in the content-wise preference of communication of the concept of love involving family. This question cannot be answered more thoroughly with the current results and would require additional research to reliably answer.

The difference between leisure and family context is not easily made. A leisure situation can be found in family context, and vice versa. The fact that a leisure context is situation that involves a family members inherently influences the information and therefore perception of what is being transferred. The second question arising is, what situation actually is determining for the image and how does this translate into the results? In other words, two brothers playing football might in western context be a leisure situation, but the fact that the persons playing football are brothers, does influence the perception of the image. In other words, it is confusing to draw conclusions on what actually on a perceptual level is the implication of this social context, of which the perceived importance is actually culturally dependent as well. Where for an individualistic researcher a family situation might not be the driving signifier for the two brothers playing football in a leisure situation, a collectivistic researcher might very well determine this to be a determining signifier. Concludingly, this categorization of situational context is by itself culturally dependent, which gives rise for many possible faulty perceived situations. Moreover, it is frequently not visible who are family members, which makes such an analysis very prone to errors, for which in this research there is introduced an acknowledgement for ambiguity: it is noted whenever a family situation could also be a leisure situation or vice versa: 43 and 45 social situation out of 200 are determined to ambiguous in the respectively Chinese and Dutch data set.

Contents

Introduction

Love for objects, products and brands in different cultural contexts has been increasingly often subject of research, facilitating marketing, communication, psychology and ultimately economics. This definition of love is however often not researched in relation with the cultural dimension of collectivism. How differs the collectivistic visual expression of love from the individualistic visual expression? Are there patterns of brightness or color use to be discovered in the collectivistic and individualistic cultural stereotypes? Do collectivistic consumers use more group pictures to express their love? Are individualistic consumers expressing their love more using products than their collectivistic counterpart?

This research builds on previously developed models of interpersonal love and attitudes of love towards objects. It extrapolates the framework of interpersonal love into product and brand love, in an exploratory attempt to relate the frameworks for interpersonal love and love towards products and brands. The combination enables increased insight in user generated image content combined with aesthetics. An online public image database, represented by users from collectivistic and individualistic backgrounds, in this research, serves the purpose of analyzing trends in visual aspects and content. The statistical features applied are image brightness, color saturation and color tone, whereas the content analysis provides insights in the amount of persons on the images, the type of objects and the social setting in which the image is recorded. The statistics on visual features and content are combined to provide additional insight in the visual representation of love amongst the two cultural contexts of individualism and collectivism.

Chapter one provides an overview about the existing academic frameworks on interpersonal love, the constructs of love and the recently added frameworks on product and brand love. It concludes by reviewing the methodologies applied and its consequences for the results obtained. Chapter two elaborates the proposed research methodology, using partly statistical descriptives and partly manual image content. Chapter three reviews the research results, using an image database of Chinese, Dutch, English and Hungarian internet consumers. It concludes by stating the future opportunities and limitations of the research methodology applied, accompanied by practical recommendations.

Chapter 1 – Constructs of love in individualistic and collectivistic cultures

This chapter defines love towards objects and brands, explains the difference between interpersonal love and love towards objects and brands. It introduces the concept of the triangle of love, as proposed by Sternberg. It continues by extensively introducing Ahuvia's perspective on love towards objects and brands. Finally, the chapter describes the connection between the constructs of love and the cultural dimension of collectivism/individualism. In other words, it take the three constructs of love and describes the dependency on the cultural dimension of collectivism/individualism regarding and discussing the differences between interpersonal love and love towards brands and objects.

Triangle of interpersonal love

The triangle of love[i] is a concept dividing the concept of love into three constructs. The constructs are passion, commitment and intimacy. All of these constructs are separate and can vary in intensity during a relationship, and are to be seen as an illustration of a triangle. The more one of the constructs is present, the further the corner is away from the centre and the longer the two legs connecting it become. The distance from the centre is not distributive and can all increase without limiting or decreasing the other constructs. In other words, the theory states that an interpersonal relation of love can have any one of these constructs or can have multiple of these constructs. Every combination of constructs will result in a different kind of relation, which are all described by a certain form of relationship. For instance, Sternberg states that an interpersonal relationship containing predominantly the constructs of passion and intimacy is recognized being *romantic love*. Firstly, a description of the constructs of interpersonal love will be provided. A description, as defined by the theory, of the combinations of the prototypes (like romantic love) of interpersonal love will be provided. Aron and Aron (1986)[ii] have stated that '*love is the inclusion of others within the self'*, which will be reviewed later in comparison to Sternberg's view on interpersonal love.

Passion

Passion is the construct that refers to *'feelings of closeness, connectedness, and bondedness in loving relationships'*. It gives rise to the experience of warmth in a loving relationship. Sternberg states that passion refers to the drives that lead to romance, physical attraction, sexual consummation, and other related phenomena in loving relationships. Passion is, as Sternberg (1986) states, '*a state of intense*

longing for union with the other', of which the following phenomena contribute to experiencing passion: self-esteem, succorance, nurturance, affiliation, dominance, submission, and self-actualisation. These attributes are related to how an individual identifies itself to be in relation to others. Sternberg concludes that the component of passion as time progresses *'at best returns to the baseline'*. In other words, in any interpersonal relationship the passionate component of love is bound to vanish over time. In a later work, Sternberg explains that romantic love has played a major role in evolution of mankind[iii]. Containing the component of passion, romantic love has been the passion component that gave the drive for sexual consummation; spreading genes.

Commitment

Commitment or decision (as Sternberg refers to this construct) refers to what in the short term influences *'the decision that one loves someone else, and in the long term, the commitment to maintain that love'*. This component includes the cognitive elements that are involved in decision making about the existence of and potential long-term commitment to a loving relationship. Sternberg in later studies shows that commitment occurs more often together with intimacy than with passion, based on a western-American population[iv]. Again referring to Sternberg (2006), commitment has played a particular role in evolution of mankind. Opposing to what seems to be normal nowadays, in the past commitment has been seen as a necessity to provide offspring the best chance to survive. Relationships in far history lasted until the offspring ceases to require it.

Intimacy

Intimacy *'may be viewed as largely, but not exclusively, deriving from emotional investment in the relationship'*, and the *'decision/commitment component as deriving largely, although not exclusively, from cognitive decision in and commitment to the relationship'*. As is the case with commitment, Sternberg (1997) finds that the component of intimacy is more often found together with commitment than with passion. This seems to be consistent with his other finding, which points out that the component of passion is bound to decline over time.

Typology of love

Sternberg constructed typology of love to provide clearer definitions of interpersonal relationships that involve love. He does that by making combinations between the constructs and describing the

perceived relationship. *Nonlove* is a situation without any of the components involved. *Liking* is a type in which there is mainly an amount of just intimacy. *Empty love* is used to describe a relationship consisting mainly of the construct commitment. *Infatuated love* consists of predominantly passion. The total presence of all three constructs is referred to as *consummate love*. The presence of intimacy and passion results in *romantic love*, whereas intimacy together with commitment provides *companionate love*. Finally, passion together with commitment results in a *fatuous love*. All of these relationships have their characteristics and are dynamic; they can change over time and are subject to the conditions of the relationship. Furthermore relationships can change from one type to the other, since the components are not fixed. Sternberg shows furthermore that overall there is less presence of the component of passion than the components of intimacy and commitment within interpersonal love.

Constructs of love towards objects and brands

After having constructed the theory of love with regard to interpersonal relationships, other academics continued researching how people perceive the concept of love towards objects, or ultimately brands. Ahuvia bases it initial research on love using Maslow's pyramid of basic needs. He described the nature of love and the history of perception of love in regard to how mankind has been functioning in different levels of the pyramid. Even though Ahuvia does not directly refer to the triangle of love, he does define the constructs of Maslow's pyramid, however directed towards objects and brands.

On a methodological level it is important to realize that Ahuvia encountered issues when researching love towards objects (and brands). Some respondents morally rejected applying the definition of love on objects, although explained to have perceived the same attributes of love as occurring in interpersonal love. Disregarding the moral rejection of love towards objects, one can however easily imagine how in parallel to interpersonal love, the love towards objects may be described. Where interpersonal love is the desire to include others into the self, love towards object might very well be described as the desire to include objects into the self in a non-physical way. This states that the perceived object attributes unleash the desire to be included into the self. To apply how Ahuvia (1993)[v] presents in his working paper the pyramid of Maslow's typology of needs, objects can fulfill a certain role in any level of the pyramid. Similarly can brands be considered to be doing the exact same,

although in an intangible fashion. Ahuvia does not claim by definition that love occurs towards objects, but certainly proves that a significant part of attributes of love were found upon informing on the relationship respondents had with objects.

Very shortly does Ahuvia introduces how sometimes objects are loved *'specifically for their aesthetic constants'* (1993), referring to the role of beauty. As this is valid for interpersonal love, this can easily be imagined to be equally valid when it comes to love towards objects (or images). Also when it comes to the appreciation of art, the role of aesthetics is clearly to unleash feelings of love because of the aesthetics per se.

Further investigating how feelings of love can be possible to occur, Ahuvia (1993) finds that '*an inability to interact with it*' makes it impossible to love an object for at least some of the respondents. The interaction in this case is a cognitive interaction, not a physical one. It moreover implies that an individual has the need to cognitively interact with an object or phenomena in order to possibly love it. In another way, the cognitive integration only takes place when there is the possible cognitive interaction. In other words, if it is impossible to construct a cognitive message coming from the object or phenomena, it will not be loved. On a more general level one could state that if the message content and message form is too much different from the individual's values or habitual form, it falls out of what is desired to be included in the self. One should have the desire to cognitively interact with the content, but moreover be able to comprehend the message in the form offered.

In an attempt to further understand how love towards objects functions, Ahuvia (2005)[vi] in another study tries to explore how consumers consider love and how they perceive it when regarding objects. Citing an earlier founding from Belk (1988)[vii], '*consumers use key possessions to extend, expand, and strengthen their sense of self*'. Ahuvia extends this reasoning using the Maslow's pyramid of typology of needs, and states that love is partly to extend the self, as well as to strengthen the sense of the perceived self. This refers to the last layer in the pyramid; self-actualisation. In conclusion one can state that love towards objects functions as an extension of the self in the sense of self-actualisation. Therefore, any object (or brand) that help extending the self by means of self-actualisation is an object or brand prone to be truly loved by an individual. Furthermore Belk (1988) states '*identity issues are central to consumption and that possessions are part of the self*', these possessions henceforth are

able to extend the self. This further reinforces the relevancy of the concept of love towards objects (and brands) from a consumer perspective.

In a later study, Ahuvia (2006)[viii] finds that '*brand love includes a willingness to declare love and involves integration into the consumers' identity*'. Keeping in mind the Maslows' pyramid of typology of needs, one could easily image that this is the top layer of the pyramid and its processes are parallel to self-actualisation, just as is the case with interpersonal love.

Merunka and Valette-Florence (2007)[ix] performed a study on French respondents, which from a methodological point of view yielded interesting results. French respondents on average are more prone to refuse application of the word love when it comes to objects or brands. A different methodology was applied by not mentioning the concrete concept of love. Instead, the attributes of the constructs were used in questionaires to understand what was loved by French consumers, without confronting them with the moral dilemma of love towards objects. It was found that the following product categories '*best represent the feelings of love':* shoes, cars, lingerie, watches, perfumes, food items, music, cigarettes, and furniture'. Moreover, the following eleven dimensions of love towards a brand are identified by the research: passion for the brand, relationship duration, self-congruity, dreams, memories, pleasure, attraction, uniqueness, beauty, trust and affect declaration.

Finally, brand love has been researched as a self-explanatory concept by Ahuvia et aliae (2012)[x]. The authors conclude that there are ten major components of love towards brands: '*great quality, existential meaning, intrinsic rewards, self-identity, positive affect, passionate desire/sense of natural fit, emotional bonding/separation distress, willingness to invest, frequent thought and use, length of use'*. The authors claim that there is limited knowledge of interaction between the identified components. Furthermore, the authors claim as well that these dimensions are expected to have a correlation with the constructs of interpersonal love.

Love in individualistic and collectivist cultures

Many researches on the concept of love have been researched using respondents belonging to predominantly individualistic cultures. Upon regarding the constructs of love used to describe the phenomena, one might conclude that these constructs are at least partly influenced by the cultural dimension of collectivism, since the constructs involve the perception of the self as an individual as a

part of groups and society. Firstly this research shortly introduces the concepts of individualism and collectivism. Hereafter, it is interesting to regard how the mechanisms function that enable love and in what ways love is connected to the perception of the self. Hereafter, it is possible to understand what might be the difference between the concept of love in individualistic and collectivistic cultures. These differences are derived from what earlier academic studies have concluded on the concept of love, however based on mainly individualistic respondents.

In order to fully understand the cultural dimension of individualism and collectivism, Gustavsson (2008)[xi] has researched how the dimension is perceived, how academics use the dimension and what on a deeper psychological level actually signifies. The author states that first of all there are two types of individualism; the external type and the internal type. The external type shows individualism with respect to actions, whereas internal individualism is found in the mind in the form of freedom of thought. The definition of individualism and collectivism carries a moral judgment dependent on culture, similarly to what applies for the construct of hate, as demonstrated by Sternberg (2004)[xii]. The normative description of the definition of individualism introduces biases the qualification. The author concludes by stating that individualism shall not be confused or equated with hedonism, or self-interest, nor with alienation or the absence of goals in life. Individualism is to be defined by the constructs of *'autonomy, privacy, and self-development'*. Especially self-development is an interesting notice in the light of this thesis, since a construct of love is self-actualisation, which can be easily related to self-development.

The researches performed on love have mainly relied on respondents having an individualistic cultural background. When it comes to the cultural background of the respondents Ahuvia (1993) used in his research, all respondents were western-Americans. Ahuvia notices that the term real love was predominantly applied to objects or activities that promoted individuation. Furthermore Ahuvia states that one of the mechanisms enabling love is the possibility to express the love towards the object or brand. If the object or brand does not enable to further express the feelings of love the individual experiences, it tends not to be loved truly. Again in a cultural context of western-Americans this would certainly makes sense, since part of the love is formed by the ability to express and define the self. This would be made impossible as soon as the self-definition and expression cannot be communicated towards the others, since one can only experience itself as an individual if there is a group to refer to.

Upon revisiting the determining the determinants for brand love for western Americans, two of them stand out when it comes to the individualistic background of the respondents: self-identity and emotional bonding, or separation distress.

Having understood the main context of love in the light of degree of collectivism, I now explore the implications on a psychological level. Kitayama (1991)[xiii] shows that the main difference of the self-identity in the two cultures come from the assigned role to the other and the self. For a collectivistic environment, the other is included into the boundaries of the self. Others are expected and assumed to reciprocate what the self is and vice versa. In the independent individualistic environment, the others are '*less centrally implicated in one's current self-definition or identity*'. Just as is the case in a collectivistic context, the others are there for social comparison and reflected appraisal, what is absent is '*a willingness to be responsive to others and to adjust one's own demands and desires so as to maintain the ever-important relation*'. The defining features of the independent self are '*attributes, abilities, traits, desires and motives that may have been social products but that have become the* property *of the self-contained individual*'. Especially the appearance of attributes as defining feature of the self shows how consumption helps to define the self in individualistic societies, and therefore can generate feelings of love towards an object. The proof of inclusion of love towards objects for an independent individualistic society does however not guarantee the exclusion of love towards objects for an interdependent society. Attributes might play a similar role in collectivistic societies, but might be present in a less determining manner. Secondly, loving an attribute might be regarded morally rejectable in collectivistic societies.

Averill (1985)[xiv] argued that since personal identity in collectivistic culture is not highly differentiated from the group, the social context fails to provide the conditions in which romantic idealization could develop. This is said to be the case for part of romantic love is to individualize the self. Dion and Dion (1993)[xv] continue stating that '*in more collectivistic societies, such as in China, traditionally, love and intimacy between a woman and a man were less important than other factors as a basis for marriage*'. Again, this refers to how the self is to be found positioned with respect to others and how the self is expected to behave and relate to the others on an psychological and practical level. Regarding love in the context of individualistic societies, the following is found by Hsu (1981)[xvi]: '*the western ideal of romantic love characterized by intense feelings, disregard of others' views of one's lover, and complete*

mutual absorption would be regarded as disruptive'. This shows the clear distinction between the position of the self and the self-identity when it comes to the emotional position towards others and the construction of the self-identity. In an individualistic society one constructs the self-identity independently from others, and uses others to test their positions and to refer to as a benchmark of the self. The collectivistic position incudes the others in the self as to partly define the self, instead of extending or benchmarking it. Paradoxically enough, the individualistic society looks to extend the self, allowing to a lesser extent a person to do this in order to avoid interdependence. It takes the reference to the traits, attributes, desires and motives that others have to measure and define the self identity. Interdependence on persons is regarded as weak, and therefore preferably avoided. For that reason others are not 'allowed' to be incorporated into the self constructed identity of oneself, but the appreciated traits and values are regarded to be incorporated in a form separated from the actual person. This line of reasoning however fully supports consuming to extend the self, since there is no interdependence occurring when extending the self using consumption of an object, attribute or activity. This would however question the role of consumption with respect to self extension or identification in a collectivistic society, a discussion which has been hinted upon earlier in this research.

Differences in mechanism and content of love between individualistic and collectivistic cultures

The conclusion combines the acquired knowledge about interpersonal love and love towards objects or brands, whilst considering the differences between individualistic and collectivistic cultures. Firstly, the content of love is discussed with respect to the cultures. Hereafter, the mechanisms of love and their differences in the respective cultures.

Constructs of love

The three constructs of love are passion, commitment and intimacy. This paragraph will consider the differences of these constructs in individualistic and collectivistic cultures. According to Markus and Kitayama (1991)[xvii], '*the most significant differences between these two cultures is in the role that is assigned to the other in self-definition'*. When considering the differences in the three constructs, this will be the point of view to start reasoning upon.

The question with regard to passion is how '*feelings of closeness, connectedness and bondedness in loving'* differ in the two cultures. Where the collectivistic culture will be dependent on others to have these feelings established, the individualistic culture is more dependent on the self. Sternberg (1986)[xviii] concludes that passion is '*a state of intense longing for union with the other'*, having the following attributes related to experiencing self-esteem, succorance, nurturance, affiliation, dominance, submission and self-actualisation. Union with the other is an interesting perspective to rethink when it comes to individualism. Individualism tends to make the self independent of the other, and promotes differences. Introducing feelings of union is seemingly interfering the need to remain independent. The union is however taking place in a different manner, as Markus and Kitayama (1991)[xix] find out: '*The defining features of an independent self are attributes, abilities, traits, desires and motives that may have been social products but that have become the* property *of the self-contained individual'*. In other words, the attributes and traits of the other are not inherited into the personal self, but a replication is constructed into the self, making the traits and attributes a property of the self instead of a reference to the other. This shows the fundamental difference between passion in interdependent and independent cultures. The independent actualizes the self through incorporating experiencing desired attributes and traits. After actualization they are identified as if they were constructed by the self, thereby owning the process of incorporation and avoiding feelings of dependency. The interdependent self would practice the attributes and traits, being recognized as something that comes from outside the self. For the interdependent it is important to owe the attributes and traits to the group, since it provides the feeling of fitting in and being in concordance with the group. In this way of reasoning, the same can be applied for passion towards persons or objects and brands. The only difference is that the person directly evokes the aforementioned, whereas the objects and brands are a means to evoke the exact same psychological processes. One has to keep in mind however that the idea of interdependence might be experienced different towards a product than towards a person. However also here the same holds: it is the interdependence that the product evokes, based on how this interdependence is governed by the product or brand. For instance, where a wedding ring in an individualistic culture might be perceived with passion directly towards the object, the same wedding ring might fuel the feeling of perceived interdependence towards the person giving the ring. In another case, the ring can represent collectivistically shared

values, which enables it to be perceived in a passionate way, since the ring evokes feelings of actualization of the self-identity through the underlying shared values. In other words, the appearing feelings of passion might be comparable, the process leading to it are however significantly different in the two cultural stereotypes.

Commitment is a construct describing, according to Sternberg (1986) '*long-term investment in a loving relationship, not to refer to the degree of responsibility one feels for another in a loving relationship'*. This shows that a higher long-term investment in a loving relationship will result in higher commitment. The collectivistic societies are more prone to be subject to influences from society and groups like family to maintain status. The individualistic form of commitment is the same long-term investment in a loving relationship, finds its origin however in the personal motivation of the self and relies on the self in the choice to commit. When transforming this line of thought to brand love or love towards objects, one could state that the choice of commitment towards an object or brand in a collectivistic society is more dependent on the perception of that choice by others. The judgment and support from peers considered to be within the group will contribute positively in deciding to engage in long-term commitment. In other words, a higher approval of peers might result in a higher level of commitment in collectivistic surrounding. In an individualistic society the same might happen, however with a different process. The individual self might experience an increased perception of the self identity by others, and for that reason decide to commit to the brand or object. As Belk (1988)[xx] introduces that '*consumers use key possessions to extend, expand, and strengthen their sense of self'*, this can perfectly hold for both individualistic as collectivistic consumers. The process on which the two stereotypes decide to commit might however be completely different. One of the dimensions of commitment is separation distress, which in both cultural stereotypes are to be found. The role of anticipated separation distress towards brands is mentioned by Ahuvia (2012), concluding this from research amongst dominantly individualistic consumers. Since Ahuvia performed its' research using individualistic consumers, it is unclear whether and how collectivistic consumers react with regard to anticipated separation distress.

A second interesting finding about commitment comes from Averill (1985)[xxi]. He finds that '*in more collectivistic societies, such as in China, traditionally, love and intimacy between a woman and a man were less important than other factors as a basis for marriage*'. In other words, if it is true that love

consists of (passionate) love, intimacy and commitment, the traditional relationship relies more on commitment than it does on passion and intimacy. This does not state the inverse however: one cannot deduce that in individualistic cultures passion and intimacy are more important. The statement either reveals how the collectivistic society is morally evaluating the long-term interpersonal relationships, or how the interdependent self decides to engage in long-term commitment because of the cognitive dependency on the other via the self-identity.

Intimacy takes place on a physical or cognitive level. As Mesquita (2001)[xxii] finds in a population of students of collectivistic and individualistic culture, '*emotions in collectivist cultures were more grounded in assessment of social worth and of shifts in relative social worth, were to a large extent taken to reflect reality rather than the inner world of the individual, and belong to the self-other relationship rather than being confined to the subjectivity of the self'.* In other words, intimacy towards the other in a collectivistic context is constructed using the joint belonging to each other in relation to the social environment, whereas the individualistic experiences this same intimacy subjectively towards the self and to a lesser extent in the context with its social environment.

Regarding initiation of intimacy, Sampson (1977)[xxiii] states that '*Problems with developing intimacy in a relationship should be most likely to occur among those persons characterized by* self-contained individualism'. Other authors (Bellah et Al., 1985)[xxiv] extend this line of thought by stating that for '*Attempting to reconcile the needs of two people in a relationship, each of whom is striving for intimacy, yet at the same time trying not to sacrifice personal control'.* The interpersonal intimacy intervenes with personal control, according to the authors. It might be questioned how this relates to love towards objects or brands, since objects or brands have a significantly different influence on control on a person. In general, the type and quantity of interaction with an object or brand is controlled fully by the consumer. For this reason, one could expect that the development of intimacy towards an object or brand might not be intervened by this control conflict. Considering the voluntary choice to develop a feeling of intimacy with an object or brand, it might even govern intimacy, for the consumer is in complete control of the level of intimacy it receives.

Mechanisms of love

Aron and Aron (1986)[xxv] show that if we love something or someone, it enables us to complete our needs and therefore we make it parts of ourselves. In order to understand how the feelings or perception of love gets constructed in our minds, it is important to know what mechanisms can govern the integration of a phenomenon into the self. According to Aron and Aron, these are creation, physical incorporation, cognitive incorporation, boundary breaking experiences and investiture. Hence it is impossible to transfer feelings of love towards anyone or anything without these mechanisms. The mechanisms are therefore of importance when aiming for being loved as a person, object or brand.

Ahuvia (1993) finds out what mechanisms enable integration into the self: '*creation, physical incorporation, cognitive incorporation, boundary breaking experiences and investiture'*. Without any of these phenomena it is impossible to integrate into the self. It seems that these phenomena lead to combinations of experiencing the constructs of love, being intimacy, commitment and passion. In other words, the mechanism that governs the love according to Ahuvia in an individualistically oriented society should evoke the desire of integration into the self. With regard to collectivistic societies, one could wonder if the same holds, or if the mechanism should enable the integration of the self into the group, since the self is supposed to be part of the group. In both ways however, one could still state that these mechanisms are fundamental to the human being. The factual events that lead to the process of the integration might be determined by culture. Regarding the cognitive way of interpreting or experiencing these events, Zhu e.a. (2007)[xxvi] applied neuroscience to explore how interdependent and independent cultures perceive the concept of self and others on a neural basis. The authors were able to prove that '*the representation of Chinese mother cannot be distinguished from the representation of their selves'.* Indicating that interdependent individuals have the same neural activity when defining the concept of the self as defining the concept of mother, whereas the independent individuals have a different neural activity when defining the concept of mother. This does not prove in the context of love that independent and interdependent individuals experience love differently: it does however make it plausible. Especially upon realizing that parental love, which involves the concept of mother researched by Zhu (2007)[xxvii], is one of the forms of love. This shows that seemingly similarly recognized forms of love are experienced differently on an emotional level,

which would explain how the cultures tend to approach the general prototype of love in a different way. Furthermore, there might very well be a difference in how love towards objects and brands is experienced as well. In conclusion, one could state that the whole concept of self and love might be attempted to be captured in the same concept, the experience on a cognitive and therefore practical level are different in nature. Parental love in an individualistic or a collectivistic context describes the same two subjects experiencing a form of love: the content of the love and therefore its experience is however different.

A second finding of Ahuvia (1993) reveals that '*an inability to interact with it'* makes it impossible to love an object. Sounding rather obvious, an inability to interact (physically or cognitively) with an object or brand disables cognitive incorporation. Ahuvia finds for instance objects being loved '*specifically for their aesthetic constants'*, which determine the way an object is perceived and therefore what cognitive interaction is generated. The possibilities of interaction in cognitive sense come from how the nature of cognition is built. This patterns of cognition are culturally driven, as Masuda e.a. (2008)[xxviii] have shown using images to compare preferences of eastern Asians and western Americans, or collectivistic and individualistic respondents. Furthermore, Ahuvia (1993) finds in a predominantly western American population that objects or activities that are said to be *truly loved* are those that promote individuation. This clearly shows the impact and relevancy of the dimension of collectivism in the way constructs love are constructed in a cognitive sense, even though the resulting content of the constructs might be the same. Since the cognitive perception of aesthetics are different in both cultural stereotypes, one would expect the visual representation of love to be different in both cultures.

In an attempt to further comprehend how consumers love objects through identity narratives, Ahuvia e.a. (2006)[xxix] continues by stating that '*brands that offer more in terms of symbolic benefits'* are distincted from hedonic or utilitarian brands. In other words, brands that have offer a deeper cognitive interaction with their consumers are perceived differently from the utilitarian and hedonic ones. Moreover, the most positively perceived brands are '*self-expressive brands'*, which seems to confirm how a brand or product is required to enable self-expression in order to be loved. The authors furthermore conclude that '*brand love includes a willingness to declare love and involves integration into the consumer's identity'*, which seems to confirm how love allows consumers to integrate traits

and attributes into the self by means of consumption. Upon realizing the respondents predominantly being western Americans, this conclusion might not be equally valid for eastern Asian consumers. Understanding that the construction of the self-identity for interdependent and independent individuals are significantly different, one can readily imagine the integration into the self occurs under different conditions as it does for individualistic consumers. Both the message content by which the self-expression is signaled, as well as the cognitive process (style of semantics, visuals) that leads to integration will be different in the two stereotypical cultures. In other words, the pure stereotypical individual self will express the self from an individual context and will refer to its own feelings and perception. Where others might have a practical supporting role in constructing the expression, the recognition of the origin will not be addressed to anyone else but the self. In contrast, the collectivist will address the origin to at least certain extent to be its' social surrounding.

In an exploratory study of brand love and cultural differences, Albert e.a. (2007)[xxx] find out that '*the memory and trust dimensions do not appear in U.S. studies but are clear in France*', which suggests that in brand love for French consumers trust and memory are of significant importance, whereas the U.S. consumer is not considering trust and memories when experiencing love towards a brand. France scores a 71 on the scale of individualism, whereas the United States score 91. The difference is significant, however not extreme. One could argue that the practical differences are caused by other cultural dimensions. It in any way shows the importance of cultural underpinnings when considering love, which will more likely be influenced by degree of individualism when the differences increase.

Ahuvia e.a. (2012)[xxxi] discovered ten major components of brand love according to a group of predominantly western Americans: *'great quality, existential meaning, intrinsic rewards, self-identity, positive affect, passionate desire/sense of natural fit, emotional bonding/separation distress, willingness to invest, frequent thought and use, length of use'*. The authors stress that the interaction between the components are not known. All of these are however easily imagined to have an equivalent component in the interpersonal relationship. The significance of the components in brand love and interpersonal love might differ, at least the two forms of love are to certain extent comparable in qualitative sense. At least the component of self-identity is a function of individualism, where existential meaning, sense of natural fit and emotional bonding also hint for a dependency on the degree of interdependency.

When it comes to existential meaning, Reker (1991)[xxxii] finds that *'personal relationships, personal growth, personal achievement, traditions and culture'* in individual and collective context contribute to an overall sense of existential meaning. This does not only confirm the intuitive fact that the degree of collectivism influences how existential meaning is assigned, it moreover confirms that brand love is a function of individualism over the component of existential meaning. Furthermore emotional bonding on itself might not as a concept significantly depend on the degree of collectivism, the circumstances through which emotional bonding gets evoked will be differing for sure. For the sense of natural fit the same holds. Even if in both cultures the sense of natural fit might be equally important, at least the practical circumstances in which a natural fit with the brand is achieved will differ. In conclusion, it is possible to state that with Ahuvia's research on brand love and its ten major components for western Americans, the content and process through which brand love exist is a function of degree of individualism.

Conclusion on brand love in collectivistic and individualistic societies

Brand love is influenced through the role assigned to others in the definition of the self, or degree of collectivism in cultural context. In passion, commitment and intimacy can be found influences from the relation others are defined to have with respect to the self. For this reason the interactions and message content that evoke brand love, constructed out of passion, commitment and intimacy, is a function of degree of individualism.

Passion is a state of intense longing for union with the other, in which the border between the self and the other in cognitive sense is a function of collectivism. In collectivism, the identity, values and beliefs are a shared part of the self identity, whereas the individualist includes only the products of these social values and beliefs as to be included into the self identity. Moreover, the individualist recognizes himself to be the source of these values. In other words, both cultures might in the end share the same values and beliefs. The fundamental difference is to whom the origin of these values and beliefs are addressed. The individualist will incorporate the values and beliefs independently of its social context into the self, regarding them as a correctly evaluated product of its social context. The collectivist will take possibly the exact same values but attributes them coming directly from its social surrounding, thereby assigning the origin to be correctly evaluated and shared by its social surrounding. Commitment is the decision to invest in a loving relationship, not the degree of moral obligation one

feels towards maintaining the loving relationship. In collectivistic societies a relationship groups like family are more determining in creation of values and maintaining them, which therefore influences the natural level of commitment towards relationships, as a larger part of the self identity is dependent on these relationships.

Intimacy through emotions in collectivism are more grounded in assessment of social worth and of shifts in relative social worth. Interpersonal intimacy in individualism is sometimes hard to evoke, since the striving for intimacy can reduce the personal control, which leads to internal conflict. This conflict might not occur when considering intimacy towards a brand or object, since the consumer is in control over the intimacy it receives. Integration into the self in an individualistic context requires creation, physical incorporation, cognitive operation, boundary breaking experiences and or investiture. This also holds for a collective context, the circumstances that lead to these processes in both cultural contexts are however different, for the relation between the self and the social surrounding is different in both cultural stereotypes.

Physical or cognitive interaction with the object or brand enables experiencing feelings of love. The conditions under which cognitive interaction is best evoked is culturally dependent, since messages are perceived with more and less regard to the message context in collectivistic and individualistic cultures respectively. Furthermore, brands that offer more symbolic benefits over utilitarian of hedonic ones, are distinguished by consumers, in which the most positively perceived brands are the ones that govern self expression, at least in an individualistic cultural context. As holds for cognitive interaction, self expression is similarly dependent on degree of collectivism, both in the content as in its appearance. In other words, where self expression might be equally important in collectivistic cultures, one will not recognize self expression having a similar practical form, neither having the same content, as the identity of self is constructed differently.

Finally, existential meaning is found to play a role in brand love. As multiple phenomena like traditions and culture, personal relationships, personal growth are all determining the perception of existential meaning, one can conclude that the construction of brand love is influenced by the dimension of individuality via the concept of existential meaning.

Current academic research perspective on approaching cultural phenomena

There have been many description of the constructs and predictions of the occurrence of love towards brands and products. Most of these researches focus on attempts to capture over questionnaires how respondents feel about several products, and how they would categorise feelings experienced towards objects or brands (Ahuvia 2005, 2006, 2012) from a consumption and psychological point of view. Other authors have focused on how to explain interpersonal relationships and how constructs of love are experienced, and what influence culture has on the dynamics of interpersonal relationships (Sternberg, 2003, 2006). Even the notion of brand love and cultural underpinnings have been touched upon, however there exists little knowledge about how love towards brands and objects are seen in the two different cultural prototypes of collectivism and individualism. Moreover, the authors researching brand love and its' constructs, mainly use questionaires and statistical models to dispute hypothesis. As many of the authors have already mentioned in discussions, these methods introduce cultural bias and possible misconception. One can hardly be sure that someone else understands a certain construct in a similar fashion.

Furthermore, even when possibly understanding how love is understood in different cultures, does not guarantee one is able to understand how love towards products or brands are understood. Or introducing more difficulty, the influence of moral rejection of brand love and therefore influencing the actual feelings that the love towards brands contains (Ahuvia, 1993). By attempting to generate the constructs of love and love towards brands, using a model that relies on the theoretical validity of all concepts and constructs used to define them, the validity, relevance but moreover correct cultural understanding of these is key. Regarding the balance of research performed in individualistic and collectivistic cultures, one could defend there is reasonable understanding of the topic when it comes to individualistic cultures.

From a methodological point of view one should however comprehend how the individualistic (American) mind set influences the research performed on collectivistic cultures, because the collectivistic culture, and therefore the understanding and implications of differences in love, are reviewed in the light of an individualistic background. In other words, the cultural context of the research performed is influencing not only the methods of research, but moreover the spectrum of possible hypothesis to be constructed and verified.

To defend this statement, one could realize that in the research of interpersonal love, there is found to be no western equivalent to the Japanese word '*amae'*, which supposedly describes a positively experienced interdependency within relationships (Dion and Dion, 1993)[xxxiii], which holds for relationship between parent and child, wife and husband, '*where one partner depends upon the other to provide indulgent gratification and considerate affection'*. Understanding that this is a view on a dimension of love that from a stereotypical individualistic culture can rarely be identified, one is bound to expect failure to recognize the complete spectrum of possible explanations on the construct of love from another culture.

The case of *amae* confirms this wide spectrum of possibly explanations, since it shows an interplay between the constructs that the individual stereotypical love would not consider to be positive, or to exist at all. Let us consider the following mathematical parallel to this abstract definition of love over the cultural dimensions. Imagine a two dimensional plane and the understanding of how a function performs on it, and a complete understanding of how to manipulate the inputs, the function, and therefore how to relate results to endogenous and indigenous variables. The two dimensional plane in this case represents a description of love, valid for a stereotypically individualistic culture. Expanding now the model space into a collectivistic culture, the two dimensional plane becomes three dimensional. Not only starts the quest for again understanding empirical results, also solution methods and data validation should be reviewed, for the influences of the third collectivistic dimension are unpredictable. To draw another parallel, one cannot apply linear solution methods to accurately explain second degree functions, whereas in this case the constructs and assumptions behind love and especially love towards products and brands cannot be taken from the individualistic model and used to accurately describe the collectivistic model. Again, where it is reasonable to assume a decent understanding of the construct of interpersonal love (and to certain extent brand love) in an individualistic context, the extension towards brand and product love over a collectivistic stereotype in my eyes is very little backed up by the knowledge acquired in the past, which is largely based on knowledge from an individualistic context.

As globalization and the amount of digital devices, and therefore the amount of generated and available media increases, the amount of interactions between media consumption and production increases too. Along with the global digitalization of the world, the amount of users generating data

on the world wide web has increased significantly in the last decades. *'User-generated content is one of the fastest growing part of the expanding information universe'* (Manovich, 2008)[xxxiv]. The International Data Corporation estimates a seventy per cent of data being generated by users, or consumers of the internet. This data contains valuable of information, of which culturally revealing either by its content, metadata or combination of the aforementioned. Manovich aims at leveraging this large pool of information by doing large-scale measurements on data available on the internet.

Understanding the rapid globalization and its vast effects, Manovich and his team even states that the contemporary frameworks of data analysis are not sufficient to keep track of changing cultural phenomena, and that temporal changes have an effect of globalization. '*Little intellectual energy has been spent on thinking about how cultural change happens. Perhaps this was appropriate given that, until recently, cultural changes of all kinds were usually very slow'.* New large data driven research methods are needed to keep track of global changes in communication, either expressing or not expressing culture, according to Manovich (2009)[xxxv]. When reviewing his own cultural analytics performed on mass data, Manovich (2011) [xxxvi] concludes that this increased worldwide interaction *'revs up both the speed and scale at which media interaction and form can lead to cultural ideas, flows and stylistic preferences'*.

In a later, more elaborate, work on these phenomena, Manovich (2013)[xxxvii] explains how contemporary methods of research and data analysis are outdated. He supports this by elaborating how cultural phenomena and cultural realities are increasingly shaped by software, an influence not represented in models. The author claims that due to the amount of software involved in the creation and consumption of visual media, it is impossible to exclude its influence on the perception of visual media. Further extending the line of reasoning that leans on the interconnectedness of cultural perception, digital media consumption and generation, Manovich calls for a '*software theory'.* This theory includes the generation method, consumption and interaction between the consumption and creation. Hereafter the author continues by elaborating how global connectivity can only occur if there is a certain level of compatibility. Or in other words, as soon as this global connectivity extends, there is at least a minimum level of compatibility, which in it carries for sure cultural values or perspectives.

This large compatibility influences could be used to argue about multiple discussions on different levels and scales, of which one of them is particularly interesting for this work. As the medium and software is influencing the visual content, a more globally unified software and medium base could slowly let global visuals converge. Since the largest software and hardware producers are already operating on a global level, the partly culturally determined perception of images is what remains. In the search for the differences between the experience of brand love in individualistic and collectivistic context, this large-scale data driven approach might reveal macro-trends and differences (or similarities) impossible to be discovered by traditional researches.

Previously applied research views on love

As long as love exists, there has been thought about it, contemplated, discussed and fought over it. Many academic disciplines have debated over the definition of love, its constructs or the connection with consumption or culture.

The concept of interpersonal love is not one-on-one related to consumption. It is however true that increasingly the concept of love is used to stimulate or support consumption. Already in the 20's diamonds have been branded to enable partners show the indeterminate love they foster for each other. How do these relationships get identified and how is research on this performed?

The marketing side of consumption is based on statistics and questionnaires. Statistics on returns and empirical data from questionnaires are used to construct hints of patterns, trends that can therefore offer clues of how love is being perceived by customers. This empirical approach tries to focus on the outcomes and the trends, it is not focused on defining the inputs or conceptually determining the fundamental definition of love, neither of its' constructs. This is not to be judged wrong, one simply has to comprehend what this methodology implies as limits. As these research models focus on the outputs and the constructed trends, one fails to identity the fundamental concept. For this reason, one cannot reliably set up a complete model that relates inputs to outputs. In other words, one can construct and deduce conclusions about the here and the now, it is however unreliable for predicting the situation in a different cultural context or a more distant point in time. Why? The empirical results coming from these data are valid for the conditions of the set and conditions of respondents. As respondents over time, and conditions over culture change, the model will decrease in reliability.

Consumption patterns in economics are more often approached from a macro perspective. This implies a set of data containing more information on the whole, however less clearly defined from a micro perspective. In other words, the total spending on love consumption might be known, the processes that govern this consumption on a cognitive level are disregarded or at least not to be deduced. The macro view justifies understanding how the main variables set are influencing each other, this is however solely valid for the environment included in the research. Moreover, economic researches tend not to connect cognitive decision making into macro-economic models. In other words, in an equal environment the cognitive decision process might be equal and therefore the model might still hold. When extrapolating the model towards other cultures and times, one cannot assume different cognitive decision making to result in the same dynamics. Macro-economic models constructed in the United States might very well predict how that society will be behaving in the coming ten years, the model will not be able to provide reliable data on how the European market, left alone the Asian market, will function right now. As is the case with empirical consumer research results, the validity highly leans on the similar conditions and environmental context.

Psychologists have been researching how interpersonal love is being experienced across different cultures, how the constructs of love interplay and how in different cultures individuals relate to loved ones. This approach increases the validity for the pure understanding of the concept of love. It however does not extend the definition into decision making and how consumers will react when influenced by the concept of love. Moreover, since the definition of love is more clearly defined closer to the source of where love in a cognitive sense gets created, it also means that the results are purer and stronger connected to the mindset of respondents. This increases the quality and reliability of the definition of love found amongst the group of respondents, but decreases the reliability of the results outside the experimental group, certainly when it comes to describing dynamics that are a result of the concept defined.

Concluding the view on consumption and love, the point is that the experience of the feeling of love is in essence unrelated to the decision making upon love. Circumstances, personal differences, moral value judgments, or cultural background introduce different decision making rationale based on a possibly similar experience of the feeling of love. Understanding that the experience of love probably differs, the assumptions that connect a framework to relate psychology towards macro-economic

models, make an overarching model rather unreliable. What remains are standalone models that might be proven reliable on itself, they are however not usable to extend each other and moreover certainly not suitable to extrapolate into other cultures, and therefore possibly not into future time periods.

Attempts to connect frameworks describing interpersonal love come from Ahuvia. The author has repeatedly tried to compare interpersonal love with love towards products and brands. Starting with exploratory studies to construct the construct of objects towards love, the author continued by using statistical methods to resolve how statements correspond with respondent behavior or experience of emotions. Again realizing the respondents were predominantly western Americans, one can easily question the validity of the findings when applied with another cultural background. For instance, upon realizing how moral rejection of love towards objects might bias the finding, Ahuvia later tried to bypass this obstacle by changing the research method. He used visual equivalents to describe constructs of love like passion or romance, and let respondents describe feelings and attitudes towards the objects, without literally stating the constructs described. In other words, scenarios of passionate love or romantic love were outlined and respondents were to confirm or object statements and attitudes presented.

The just mentioned change of research methodology shows the recognition of how deviation from the traditional questionnaires deemed required for a mere moral rejection of applying the concept of love in a non-interpersonal context. It is therefore readily imaginable that additional culturally governed attitudes toward love, passion or romance, is causing misconception. This moreover means that the more individual a research is performed, the less valid it becomes to apply to larger groups. Moreover, taking an average of attitudes and scores towards statements might not make sense from a fundamental psychological point of view. The cognitive processes and associations through which passion or romance exists are simply different in qualitative sense: averaging scores on statements and attitudes assumes them to be different in quantitative sense and will therefore allow acknowledgement of different ways of loving in for instance different familial education, left alone different cultural backgrounds.

The field of marketing is partly driven by communication. As some brands increasingly use love in the communication towards clients, it is of relevance to understand how love is exactly understood, how it is effectively communicated. The definition of love from a psychological point of view can be playing a supporting role in marketing, the main aim is however to communicate to customers in this case love or a construct or attitude of love. Marketing typically focusses on how communication inputs result in experienced feelings or attitudes toward a message, brand, or product. Even though collectivistic and individualistic consumer behavior has been topic of extensive research, the combination with the experienced definition of brand love and how to evoke it, has been researched to lesser extent. Moreover, these researches find their base on a fixed definition of love and its constructs, of which the construct dependencies are assumed not to vary between the groups of respondents. In other words, the definitions communicated to two different groups are assumed to be understood similar by both groups. Especially when it comes to love, marketing is not considered to define how humanity reflects upon romantic love or passionate love from a psychological perspective. This might however make the difference in the decision making scheme, and therefore consumer behavior or effect (from a marketing point of view), since two groups consisting of individuals with different cultural backgrounds are bound to understand the same definition of love in a different way, and moreover react differently to this supposedly same theoretical condition. It is therefore difficult to construct sound conclusions based on a method that fails to differentiate between types of love and their effects on a psychological level. To hereafter deduce statements about how communication is best constructed or received on a content or syntactical level, could therefore be considered at least partly invalid.

Large visual data sets and pattern recognition

Chapter two will further elaborate how large data driven researches can support in revealing differences in cultural perspectives on love, and possible love towards brands. The deviation from the traditional research methods enables more exploratory questions to be answered, like '*do users from collectivistic and individualistic cultures generate different media to represent love, or brand love?*', or '*what differences in visual features there exist in the aesthetic representation of the concept of brand love*?'. Moreover it is possible to answer questions like '*do different cultures represent love using similar colors, saturation or brightness?*' In an exploratory concept of visualizing user generated

content, quantifying parameters between the two cultures can be used to recognize differences or similarities. After an initial round of investigating, more thorough hypotheses can be disputed, like '*do collectivistic cultures depict love using groups more than individualistic cultures?'*, or '*is there a larger tendency to depict objects than to depict persons when depicting love?'*. Furthermore, on manual analysis of images one can try answering the question '*does love in individualistic cultures get depicted by persons or objects?'*, and '*do collectivistic cultures depict love by depicting more persons than individualistic cultures do?'*.

Chapter 2 – Methodology, conceptual limitations and opportunities

This chapter introduces the methodological rationale behind the research and from what angle visual data is regarded to be useful with regard to this methodology. It shows what is the line of reasoning applied and what in practice are the steps taken to yield the results. It firstly goes into how the images are converted and how the visual features are computed. Hereafter a manual inspection of a sample of the image set is discussed.

Research methodology rationale

This section introduces the data availability which enables to develop a research rationale, suitable to construct exploratory analysis in the field of visual representation of images across cultures.

As the amount of electronically registered generated, consumed and stored is increasing on a daily basis, the importance of this data increases likewise. Massive databases, massive data consumption and hosting platforms continue to grow and therefore provide opportunities for research. As analysts increasingly use large pools of data to research trends, patterns, behavior and a multitude of other phenomena, globally research is increasingly relying on so called big-data analysis, automated analysis and data mining. In other words, large databases are used to perform analysis, which can consequently confirm or reject hypotheses of interest. Just like an extensive database of stock price history can contribute to revealing patterns and trends, the availability of large visual databases offers interesting possibilities for communication and marketing areas. Where marketing and communication agencies focus on understanding how messages are perceived and how to understand best visual perception, a large database with images can be used to discover consumer preferences, perception, and much more. The continuously increasing amount of interlinked data is useful in researching complicated relationships that was previously impossible due to the low availability of metadata. In these days, an Instagram image appears online accompanied by the time it was posted, the location, the amount users following the user who posted the image, and much more. The diversity and quality of this so called metadata enabled testing complicated hypotheses. There have been multiple researches trying to unveil visual preferences of consumers based on databases of image ratings by users. This allows testing for correlation between image rating and visual features, which could reveal visual preferences amongst online users. This line of reasoning in combination with extracting information using large sets of data and its' metadata, can be applied to virtually any area of interest and any type of data

stored together with its' metadata. This research methodology aims to apply it on a large database of user generated visual content in order to discover cultural differences in visual representation of the concept of love.

Traditional representation and analyses of information in research areas like marketing, economics and marketing often rely heavily on numbers and values. When using big data analysis on visual information for the purpose of marketing and communication, traditional representation and research methods might not be able to provide reliable data representation nor validation methods. In other words, where a single stock price value is directly providing an insight, for visual information it is the combination of many pixels in an image that provide an insight into the data (the complete image). In other words, to the human perception, the numbers-driven way of researching image databases might not reveal useful insights.

When it comes to research performed on visual information representation like photography, there have been many researches, using many different methods. The method proposed here is relying on the images created by many different online users. Understanding that very much visual content on the internet is user generated, one could say that the consumption and generation of visual images is more and more (on a quantitative level) from consumer to consumer, certainly when using an online social platform like Instagram or Facebook. Since the perception of images are things that are partly culturally taught, one could state that in the cloud of users interacting with each other, there is present culture of consuming, creating and interpreting visual information. Understanding this, one could derive from this information habits, attitudes and preferences regarding creation, consumption and interpretation of visual information.

Using this method of hypotheses testing on visual images on a large scale, one needs to understand how the mass representation of visual information can be done in a large database context. The usual database constants like stock price trends, patterns, averages are commonly expressed in numbers and formulae, which are thereafter possibly visually represented in graphs, pie charts, scatter plots etcetera. Typically an electronically stored image is captured using pixel location and color values, of which a message is hardly resembled by a number. Since however perception of images is hardly expressed in a numerical fashion, a numerical approach to visual data might prove difficult. Looking at

sequences of color values and respective locations might not result in very much insight, since it is the particular combination of all of them that, only when displayed altogether, is assigned a meaning to. In other words, seeing all the color values and positions expressed in numbers does not make one understand what an image looks like, nor what the image means. How are images on a large scale able to be analysed by numbers without losing the meaning they represent?

In an electronically resembled image, every pixel is represented by three color values (the so called *color channels*) and the respective position in two dimensions. Combining the color values in every pixel and displaying all pixels at their respective allocated position, a representation of an image is constructed using, just as with stock prices, numbers.

Firstly, a color expressed in a number is not intuitively understood, as humans are used to visually perceive a color instead of pixel values that are supposed to represent a color. In other words, it is hard to 'perceive' the color red when reading [255,0,0], which is the electronic representation of the color red in the commonly used RGB color space. Secondly, even if we were able to perceive the pixel value of pure red in a similar way we perceive the primary color red, it are the pixel values altogether in their respective order that represent an image. In other words, a simple Instagram image (standardly 600 by 600 pixels) would be represented by 3600 of these values in their respective order, in total 10800 distinct numbers. In other words, the distinct pixel values, left alone the combination of all of them that construct an image, do not signify a message to the human brain; it is the visually represented image as a whole that conveys a message by showing an object, a situation or a feeling. Extending this line of reasoning, one could state that representing images purely by pixel values, or numbers and values, makes little sense to understand its perception, left alone to analyze visual information created to convey a message.

In order to bypass the challenge of understanding pixel values and doing research on large image databases, a new method is presented. This method uses visual *features* (a feature is computable with algorithms) to visually represent images. Instead of using the traditional representation of data, this method allows showing the actual images plot-wise. Where one normally represents a data point by a dot or point, the data points in this *imageplot* are the actual images, showed on the respective coordinates in the plot. The data represented by the axes are free to choose and one can therefore

see the relation between for instance the average saturation and the average brightness of a set of images in a scatterplot, whilst seeing the actual images in the scatterplot. This method allows an exploratory research on visual trends and patterns, for not disregarding the actual content of the image. Since the human is able to understand and perceive images in a much wider perspective than algorithms can at the moment, this way of resembling image sets is promising.

Contextual analysis and visual feature connections

Having performed the indexing of all the images organized per visual feature, it is possible to review the dataset and draw conclusion on patterns that promise interesting, like a combination of color use and brightness, a difference in standard deviation between cultures, and hypotheses alike. A focused manual inspection allows to form hypothesis by using additional contextual analysis, since the actual image is directly visible. In this way, visual feature probability can be linked to semantics in images. The occurrence of persons and objects like the sun, the sea, trees or cars can be directly related with visual features like brightness, saturation and hue. After the semantics of interest have been selected, the manual inspection yields contextual analysis within a certain range of feature value. As an example, one can obtain whether or not there are differences in the amount of persons on a picture between the two cultures when depicting love.

Methodology steps

This section will introduce the steps required for applying this methodology. It consists of measuring image *features* (a feature is a parameter computable by an algorithm) and constructing the plots of interest, which in this case will be dependent on the features like saturation, brightness and hue. This methodology supports partly visual comparison between multiple large set of images. This research focuses on discovering differences between visual user generated content in individualistic and collectivistic cultures. A sample of about ten thousand Instagram images hashtagged with the translation of *love* is used. After having stored the set of pictures, an automated feature based image analysis will start. This automated feature based analysis has to be performed on both set of images in the data set. The first image is opened and all the pixel values of the image are stored. The procedure of computing the median and standard deviation for a feature is repeated for the whole image set. The data set is stored sorted by filename of image, image available metadata, feature median and feature standard deviation. This tab delimited text file allows storing every image in a new row

whereas the individual filename, visual feature values and possibly metadata are stored in subsequent columns.

This methodology partly relies on pixel values of images, which consist of pixels usually represented in the *RGB color space*. The pixels are represented by three values; red channel, green channel and blue channel. The color channel values are defined in a range from 0 up till and including 255. The lower the value, the darker the *color channel* is represented. Vice versa, the maximum value of 255 represents a fully saturated color channel. The red, green and blue are all separated color channels and all colors represented on an electronic display are constructed by mixing the RGB color channels. All gray scales (which do not show any notion of color) vary from pure black to ultimate white are represented by mixing equally the three color channels. Pure black has the value [0,0,0] and ultimate white is represented by [255,255,255]. By mixing the color channels unequally colors appear, and therefore every pixel within an image can be expressed using three values. These RGB values can be used to compute the mean visual features of an image by using saturation, hue and brightness. The following sections will provide information on how these features are computed. The three visual features will be accompanied by intuitive examples.

Brightness

Brightness, as intuitively understood is a measure to indicate the level of light. A black color has a very low brightness, whereas a white surface is high in brightness. The brightness is a concept independent of color, it does not reveal nor show an indication of any use of color in an image. An equally lit image of a green surface, a red surface or a gray surface can all have the same brightness. Mathematically, the method approached brightness as follows. It takes for every pixel the average of the three color channels and assigns that value as a brightness per pixel. Hereafter the average (or median) brightness and standard deviation brightness of the whole image is computed using all the single brightness values of all the single pixels. The domain that indicates brightness is from 0 to 255, where 0 represents darkness and 255 is the lightest value there is. After computing the median brightness, the procedure computes the standard deviation of the brightness values of the single pixels in relation to the average brightness of all pixels together. To make this intuitive, a white wall will get a high brightness, whereas black dirt gets a low brightness. A gray building will be in between.

Saturation

The intuitive description of saturation is the color *purity*. This is a measure to show how much a color is purely displayed. The same color of pure red mentioned earlier with RGB values [255,0,0] will have a 100 per cent saturation, because the red channel is fully used. The saturation is not a measure for what color channel is dominant, it is an indication how much differ the usage of the color channels. In other words, if the green in an image is present in pure form [0,255,0], the saturation will be high. The same can happen for any other pure color, like cyan [0,255,255]. If all color channels are fully used [255,255,55], the color is pure white and there is 0 per cent saturation, since there is no difference in the color channels. If then for instance the blue channel is set to 0 (RGB notation [255,255,0]), a bright yellow color will emerge with a 100 per cent saturation, for the differences between the color channels are maximum. An intuitive example of a highly saturated image is to imagine grass field with a clear blue sky. The green grass fully uses the green color channel, and the sky relies on the blue color channel, which causes a high saturation in both the grass and the sky colors. Since all the pixels in this fictional image have a highly saturated value, the average saturation value will be high. Moreover, the standard deviation between the saturation of pixels will be low, since all of the pixels will be close to equally much saturated. An amount of white colored clouds would increase the standard deviation and decrease the median saturation, for pixels in the white clouds are not saturated and therefore increase the standard deviation. Bear in mind that the median will drop, for on average the pixels will become less saturated.

Hue

The feature hue is about the kind of color used. In other words, the hue shows the color tone of a pixel. A red pixel can increase in brightness and saturation without changing the color tone of the red and thereby the hue. The hue is best imagined to be a color wheel that is turned, where the increasing value represents turning the wheel, thereby slowly changing from red color tone to green color to ultimately blue color tone and back again to red. For this reason the values indicating hue in this method go from 0 to 255, where 0 is represented by red, the value increases gradually to represent respectively yellow, green, cyan, blue, and returns to violet/red tints when approaching 255. The average hue therefore indicates the dominant color in a picture, whereas the standard deviation shows how many pixels represent deviating colors from the dominant color in an image. In other

words, a clear blue sky will have the hue value corresponding to the color blue (about 140) and will have a low standard deviation, since all tints of blue in the sky are close to the average value of the blue found in the sky.

After the data preparation, the yielded results need to be represented in a way that enables hypothesis testing. This is done by representing the data set in two kind of ways. In this method, it is the combination of the two representations that enable validity and context analysis simultaneously. The hereafter introduced *imageplots* allow gaining contextual insights, whereas the histograms provide a way of validating the data set and the conclusions drawn.

Data representation in combination of Imageplots and histograms

The method relies on a combination of two types of plots. All the data is represented in an *Imageplot*, a term invented by software scientist Manovich. Hereafter, histograms are constructed using the same data. Firstly the imageplot construction is introduced, which is followed by an explanation of how to combine this with histograms.

Imageplots

The application plotting these *imageplots*, has an unconventional method of representing visual information. As is completely usual with two dimensional plotting, one can select two dimensions to be represented by the axes. The datapoints in the scatterplot do not consist of dots representing the points, they are the rescaled images themselves on the position where traditionally the data point
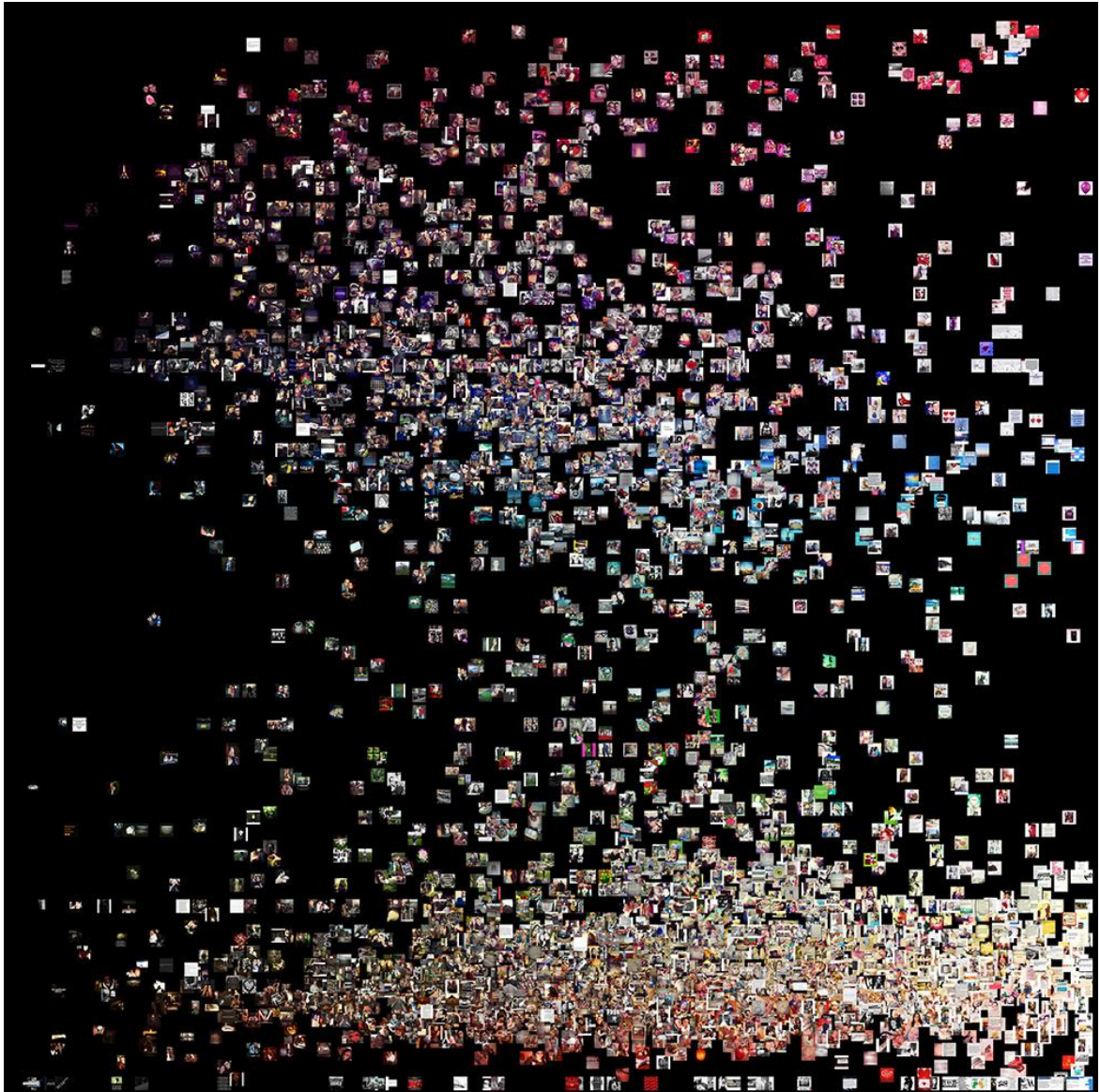
Figure 2.1 Imageplot of median brightness versus median hue, using approximately 5000 instagram images

would be. By retaining the actual images in the graph, one can directly see how the images look. By changing the axes of the graph, one can achieve to visualize relationships as desired. In this case it is desired to discover patterns and trends in visual features in images, such that the axes will represent the features of interest. An impression of such a plot is provided below in figure 2.1, in which the images have been reduced in size for reporting purposes.

The image plots are plotted using the features as axes. To get a general overview, every feature is plotted in an imageplot, using the median and standard deviation of every one of the features brightness, saturation and hue. Hereafter, combinations of features are constructed by using the median brightness and hue, brightness and saturation, and saturation and hue. The following axes are used when constructing imageplots for all image datasets, resulting in six imageplots per set of images.

1. Median brightness versus brightness standard deviation
2. Median saturation versus saturation standard deviation
3. Median hue versus hue standard deviation
4. Median brightness versus median hue (depicted rescaled in figure 1 above)
5. Median brightness versus median saturation
6. Median saturation versus median hue

The imageplots allow visual inspection of images sorted by visually recognizable features like brightness. The imageplots however do not directly allow to gain insight in the amount of images being found in the domains of the plot, which is useful for validation purposes.

Histograms

In order to get a grasp of what combination of features occur more frequently in the data set, both one dimensional and two dimensional histograms are constructed. The two dimensional type of histogram is used to easily compare probability with the imageplots.

The one dimensional histograms of the visual features allow to deduce probability in one dimension. Figure 2 illustrates a visual comparison between one dimensional histograms found, using the translation of the word 'love' in four different languages. For all subsequent features, these histogram plots are constructed and this is done for every set of images hashtagged with the word love in a

different language. This provides 6 one dimensional histograms for every translation of the word love in another language.

1. Median brightness (values 0-255)

2. Standard deviation brightness

3. Median saturation (values 0-255)

4. Standard deviation saturation

5. Median hue (values 0-255)

6. Standard deviation hue
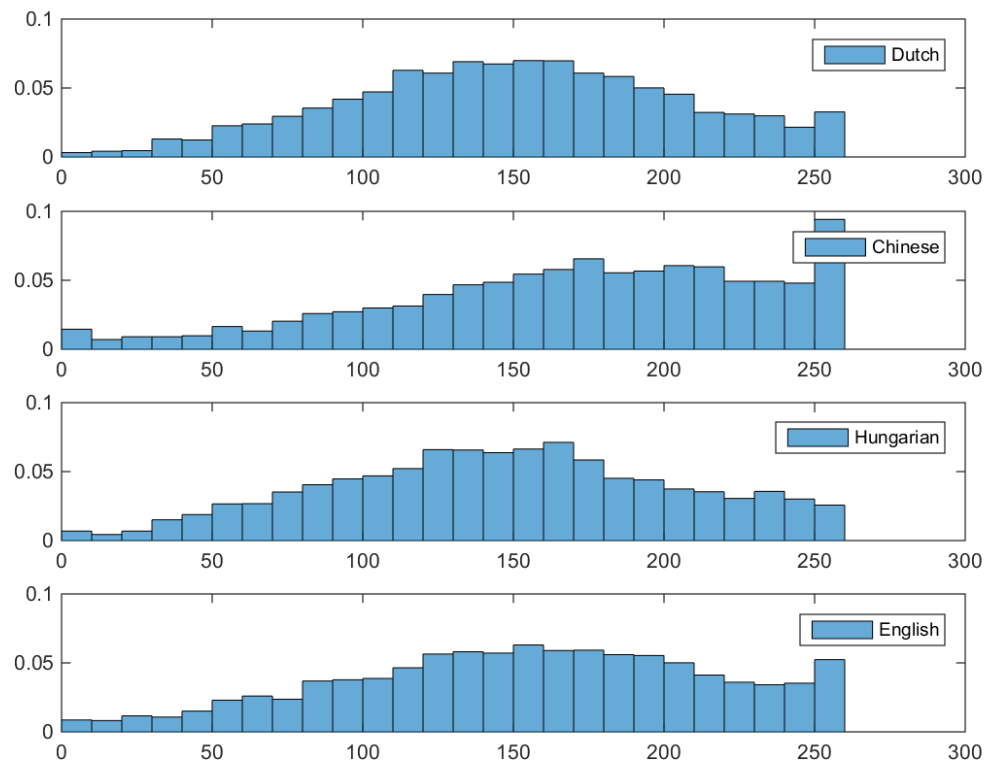
Figure 2.2 Example histogram showing median brightness values. The labels represent in which language the word love was used to find the images of the data set

The histograms in figure 2.2 do however not allow to connect the median brightness to any other feature, like for instance the brightness standard deviation. In particular, the histograms are hard to

be interpreted in relation with the imageplots, since the imageplot shows images in two dimensions, whereas the histograms do not provide the two dimensions as would be in correspondence with the imageplots. For this reason, two dimensional histogram is constructed using the same dimension on the axes as the imageplots do with the main features.

1. Brightness median versus standard deviation
2. Saturation median versus standard deviation
3. Hue median versus standard deviation (as exemplified by figure 2.3)
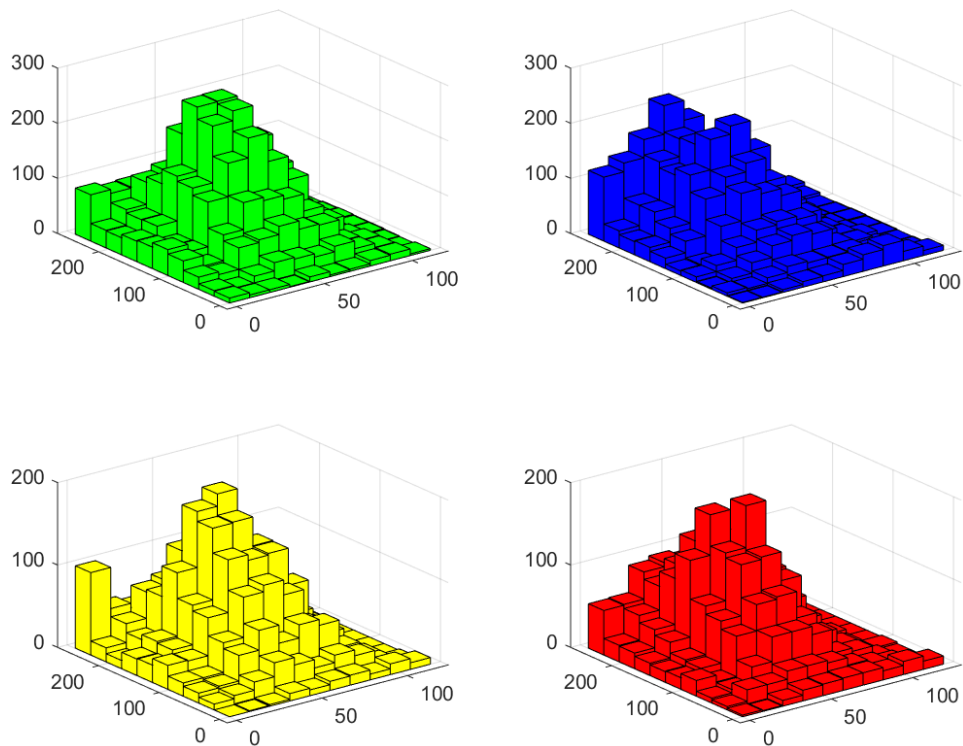
Figure 2 3 Two dimensional frequency histograms of the Hue median and brightness for four datasets of images hashtagged with love in different languages

The histograms provide an insight in the validity of the imageplots and the interesting domains. The peaking areas in the histograms provide the most probable occurrence of images, or in other words show the domain for an image set to be most likely to occur in relation with visual feature.

The plots generated provide insight into patterns. In this case, relations between brightness, saturation, hue in different cultural contexts can be compared with one another. Any difference can be noticed by visual inspection from either the imageplots or the histograms. Differences can be in the form of occurrence quantity, or in the form of content differences, visual in the imageplots. This allows an exploratory view on possible differences or similarities without disregarding the possibly important role of the actual content of the images.

Moreover, these histograms alone can answer questions that do not directly relate to image context or meaning, like '*does color use in images hashtagged with love differ according to cultural background?*', or '*are images representing love in collectivistic cultures brighter than images in individualistic cultures?*'. The histograms answer these questions by comparing the frequency of occurrence.

Context analysis

This research focuses on researching visual connotation of love in collectivistic and individualistic cultures. Instead of deriving the denotations of the concept of love, this data driven analysis focuses on revealing visual denotations of the message of love in individualistic and collectivistic cultures. In other words, the objects more frequently occurring will reveal what is more frequently used to denote a message involving the transmission of the concept of love. A count for amount of persons per image is performed on 200 images per set, thereby attempting to provide an indication the whole data set. The selected set is then considered as a new dataset and the procedure of generating the imageplots is repeated for the random sample, accompanied by the data representing the amount of persons in the picture. In other words, the random sample is taken used to understand if the amount of persons depicted in the images is dependent on cultural context. Context analysis is used to acquire an increased understanding of this culture.

The context analysis will focus on several criterion, like the amount of people on a picture, whether the image refers to non-human content, subdivided into the categories like landscape, animals, plants. Furthermore, social roles will be analysed: work life, leisure or family role patterns are subject of research.

Person count

The amount of humans in the image determines the person count. If the person is not displayed completely, this also counts as a person. Two sets of hands holding each other is counted as two persons, since the two sets of hands signal the inevitable presence of two persons. If there are four feet on the beach, the person count is two as well. A person on the background which is coincidentally captured in the image is not counted as a person. The most usual situations in which this happens is on the street, where people are passing. As long as the image clearly shows that these people are not consciously included on the image, they are not counted as a person. Furthermore, a drawing or illustration of humans or human figures (like in comics) are also counted as a person, as long as the person is deliberately shown in the image. Person count has four options. No persons results in 0, a single person in a 1, two persons in 2 and more than two persons is considered a group, resulting in a 3.

Content count

For the content analysis four categories are acknowledged: landscape, animals, plants and objects. The definition of a landscape is not the traditional definition of a landscape. Any environment deliberately taken to contribute in the understanding of the image is counted a landscape. An image taken in the kitchen or in public transport is not considered a landscape, whereas an image of a person posing in front of a national monument is counted to be a landscape. There is no count in the amount of landscapes: without landscape the count is 0, with one or possibly multiple landscapes the count is 1.

The animal count is done on all types of animals, as long as they are clearly depicted to be an animal. The amount of animals on the image is disregarded, and therefore the animal count is either 0 or 1.

Plants and flowers are both included in the plant count, including edible vegetation, as long as it is not presented as food. A tree in the background is counted as a plant as long as the tree is clearly visual. A bouquet of flowers is counted as 1, since also this count is not about the amount of plants.

The object count recognizes everything not mentioned before, except for food. As in daily life there are many objects, the object count is restricted to count objects deliberately depicted in the image. A chair on which persons are sitting is not counted an object, whereas an image of a chair presented as

the subject is counted to be an object. Whereas the table with food in front of people is not counted to be an object, this is counted an object if the table with food in front is the subject of the image, or in other words consciously included on the image. The same holds for any recognizable graphic of an object, like for instance a heart displayed in the image, or a star which is clearly recognizable in an image. Object count disregards the amount of objects, it is either a count of 1 or 0 in absence of anything qualifying to be an object.

Situational context count

The situation analysis focuses on the social context of the situation depicted. The three possible situations are family related context, work related context and leisure or free time context. In any obvious family situation or ritual, the family gets a count 1. In the case of labour, the work gets a count 1. If the first two conditions do not apply to the social context, the situation is counted to be a leisure situation and leisure gets count 1. In case there is no social context to be derived from the image, every category gets a count 0. In case of doubt between two situations, both corresponding categories score a 1. Any image of a single baby is counted to be in a family context.

Chapter 3 – Results and discussion

This chapter introduces the obtained results using the methodology as discussed in chapter two. Firstly, it presents the statistical findings of the visual feature like brightness, saturation and hue. Next is presented the content analysis. Hereafter, it connects the results with a content analysis in the light of chapter one. Concludingly, it reviews the applicability of the methodology used, the validity of the dataset and ends with recommendations.

Results

These results are divided in two sections. The first section focuses on the results obtained by only the data by means of histograms and imageplots, hence the context analysis is excluded from this first section. The second section presents the context analysis results, and how the results relate to the completely automated results in section one.

Algorithm based conclusions

This paragraph presents conclusions about the automatically generated results like the imageplots, one and two dimensional histograms. The dimension considered are both the mean and standard deviation of the features brightness, saturation and hue. Lastly, an ANOVA analysis is performed on all the images and the results are discussed at the conclusion of the feature based conclusions. The following table 3.1 presents the statistical values of the data set. It presents the average brightness and average standard deviation of the image sets, specified by language of hashtag and the by amount of images weighted averages of values found for the individualistic cultures. Hereafter, the differences are computed with respect to the weighted averages of the three sets of images from individualistic cultures.

Table 3.1 Statistical results of the feature based analysis, organised by language of hashtag

Image set	# images	Brightness		Saturation		Hue	
		Median	*Variance*	*Median*	*Variance*	*Median*	*Variance*
Hungarian	4520	146	63	78	51	80	70
English	4392	153	64	69	52	76	69
Dutch	6061	149	63	70	48	75	70
Weighted average	14973	149,3	63,1	72,3	50,0	76,8	69,7
Chinese	5520	168	60	63	51	69	67

Differences w.r.t. weighted average	Brightness		Saturation		Hue	
	Median	*Variance*	*Median*	*Variance*	*Median*	*Variance*
Hungarian	-2,6%	-0,5%	7,8%	1,1%	4,3%	1,0%
English	2,7%	1,0%	-5,2%	3,3%	-1,5%	-1,8%
Dutch	-0,1%	-0,4%	-2,8%	-3,4%	-2,3%	0,5%
Chinese	11,2%	-5,4%	-15,1%	1,4%	-12,0%	-4,7%

Brightness

As the median brightness shows, the Chinese data set on average is a rough ten per cent brighter than the individualistic data set. The average variance of the very same data set however yields a lower variance for the Chinese data set, indicating that the images are on average to be found brighter, but the brightness for a separate image varies less within the picture itself. In other words, since the variance of brightness also is a measure for contrast, the contrast is lower. Concludingly, the Chinese data set yields on average brighter images, having a lower contrast than the individualistic data set has.

Saturation

For the color saturation, the median saturation is significantly lower than the average individualistic image, scoring less than 15 per cent brightness. The average variance of the saturation for the pixels is not significantly different. Concludingly, an image from the collectivistic Chinese data set is probable to have a lower brightness than the image translating love in an individualistic data set. The variance of saturation is not noticeably different. Pixel brightness and saturation are interrelated, and the lower saturation might therefore be related to the elevated average brightness. The discussion will further elaborate on this.

Hue

The median hue value of the Chinese data set is 12 per cent lower than the median individualistic hue, whereas the variance in hue values are not significantly differing. This means that the median lowever hue value in the Chinese set, shows how the average color tone used in the image set is different. Since the hue is defined in color tone, the actual hue value is more interesting than the average difference expressed in percentages. The average hue for the Chinese data set is 69, whereas the average value for the whole individualistic data set is 76,8. The value 0 represents red, 120 green, 240 blue and ends at 360, being red again. The expression of the average hue in a value is less intuitively interpretable, since any color tone that represents some pink or violet in the color red, makes the value go below 0 and therefore is close to 360. For this reason, any kind of red, ranging from violet/pink-red up to orange range from a 330 degrees to a 360 degrees, and from 0 to 30 degrees for orange. For this reason, the actual hue value represents a dominancy of a certain color tone. The

average of all color tones however do not make sense as an absolute value, because a two colors of hue 1 (very close to pure red) and hue 254 (also very close to pure red) will average 127,5 which is close to blue. In other words, where the comparison of the values make sense (different color use will result in a different average hue), the actual median of the values do not make any sense to determine the average color.

ANOVA analysis on the overall data set

On the whole image set an ANOVA analysis is performed in order to more clearly articulate the differences between the natures of the image sets from differing cultures. Firstly the overall group is analysed in order to prove the existence of difference, after that the differing component is analyzed with respect to the remaining group in another one way ANOVA test. For the reason just mentioned, the hue is excluded from the report discussion, even though the findings support differences: it is impossible to support any other finding than the mere statement that the distributions are different. For completeness, the original SPSS output file (including the data on hue) is attached in appendix A, in which data set input number 1, 2, 3, and 4 represent the images collected from respectively Hungarian, British/American, Dutch, and Chinese.

The overall oneway analysis shows significant differences in the 95 per cent confident interval for the mean of the brightness, saturation and hue. The first three datasets together provide a 95 per cent mean brightness confidence interval between a total range of 143,83 and 155,16. The Chinese data set this interval from 166,51 to 169,82. For the median saturation the same holds, but vice versa. Whereas the median saturation overall is much higher, the Chinese image set shows a lower confidence interval on the possible saturation mean, having the maximum interval value below any minimum interval value of the other groups.

95 % Confidence Interval for the Mean			
		Lower	**Upper**
Median Brightness	Hungarian	143,83	147,19
	English	151,57	155,16
	Dutch	147,71	150,47
	Chinese	166,51	169,82
	Total	**153,54**	**155,17**
Median Saturation	Hungarian	76,93	79,89
	English	67,24	70,19
	Dutch	69,17	71,47
	Chinese	61,42	64,18
	Total	**69,05**	**70,42**

Table 3.2 Statistics generated by SPSS, revealing confidence intervals on the means of brightness and saturation

Continuing the analysis with the main ANOVA test, table 3.2 yields the F values for the median brightness and saturation found, in which a higher F value represents a larger deviation from the null hypothesis. The closer the value gets to 1, the more the compared distributions are similar. The significance level (or P-value, as oftentimes referred to) indicates the importance of the finding, which becomes significant below a value of 0.005 (as to be found in Appendix A).

ANOVA Results		
	F	**Signific.**
Median Brightness	151,52	0,000
Median Saturation	83,11	0,000

Table 3.3 ANOVA results for the overall data set

The ANOVA results in table 3.3 clearly show a large difference in the brightness, and a less large difference in the saturation. Both carry a significance of lower than 0,005, which makes them eligible to acknowledge the statement. This however does not support any difference in terms of intervals or quantity, it simply affirms a significant difference in the data sets with respect to the found median brightnesses and saturation. For this reason, the report now provides an additional ANOVA analysis ran on the difference between the first three and the last dataset, in other words: the Chinese data set versus the joint three other data sets of images.

ANOVA analysis of the collectivistic versus individualistic data set

In order to more clearly show the differences in the data set nature between collectivistic and individualistic data set, the ANOVA focus is now on comparing the Chinese data set directly on the

others, considered as a joint part. As the descriptive means are already presented, table 3.4 focuses on the 95 per cent confidence intervals for the Chinese versus the rest of the data set.

95 % Confidence Interval for the Mean			
		Lower	**Upper**
<u>Median Brightness</u>	Remainder	148,34	150,18
	Chinese	166,51	169,82
	Total	**153,54**	**155,17**
<u>Median Saturation</u>	Remainder	71,51	73,07
	Chinese	61,42	64,18
	Total	**69,05**	**70,42**

Table 3.4 Confidence intervals for the Chinese versus remainder, for brightness and saturation

Whereas table 3.4 clearly shows the differing 95 per cent confidence intervals, the ANOVA test is repeated for this data set and presented in table 3.5. As to be concluded, the Chinese brightness indeed differs a loft from the remaining data set, with a significance level affirming the validity. For the saturation median the same holds, but the F value is lower, indicating a less large difference. The significance level is however also here affirming the validity, being lower than 0.005.

ANOVA		
	F	**Signific.**
<u>Median Brightness</u>	414,1	0,000
<u>Median Saturation</u>	147,625	0,000

Table 3.5 ANOVA comparison of Chinese data set and the remainder, brightness median and saturation median

Even though these ANOVA tests do show some significant differences, further inspection would be needed to validate these conclusions. ANOVA functions under the assumption of similar standard deviations between the compared data series, which might not be the case at all. In this case, there are obvious differences to be found in the descriptive statistics and the confidence intervals of the predicted means. The interrelated analysis and the resulting F-values and P-values rely on the assumption that the standard deviations of the phenomena described are similar. Looking at the distributions generated earlier in this report, together with the standard deviations found in each of the data sets, this similarity between standard deviations are not affirmable without further research. The descriptive statistics do however strongly suggest for decent evidence of obvious differences, in which especially the 95 per cent confidence intervals confirm the visible differences in the histograms generated earlier on.

Content analysis conclusions

This paragraph presents conclusions regarding the context analysis performed, as a second step. The content analysis is performed on two hundred images of the Chinese and of the Dutch data set. In

total 400 images were manually analysed, yielding the following conclusions as presented in table 3.6. The content analysis is divided in three separate parts. On part attempts to find out what is the amount of persons on an image that is hashtagged with love. The second part is content-focused, or tries to understand what is the depicted content of an image. The last part shows the social context of the image.

Table 3.6 Content analysis statistics on two randomly selected samples of 200 images: the difference is expressed with respect to the Chinese counts

		Chinese	**Dutch**	*Difference*
Amount of persons	Single persons	51	42	*-18%*
	Two persons	28	82	*193%*
	Groups	31	26	*-16%*
Content	Landscape	28	32	*14%*
	Animal	14	23	*64%*
	Plant	14	11	*-21%*
	Object	72	41	*-43%*
Situation	Family	42	76	*81%*
	Work	18	7	*-61%*
	Leisure	142	143	*1%*
	Ambiguous situation	43	45	

Persons displayed

As can be deduced from the person count, the overall amount of images displaying persons is larger in the Dutch sample: 110 Chinese images and 151 Dutch images display persons. The distribution over the amount of persons displayed is not alike. The Dutch image set contains many more images representing couples, up to almost thrice the amount of couples than to be found in the Chinese sample. The single and group count display a 18 and 16 per cent difference respectively, which is significantly different but less evident than the almost 200 per cent more images displaying couples. Please bear in mind that any two persons depicted in an image count as a couple. A baby with a grandfather as well as two people kissing are counted as a couple.

A chi-square test is performed in SPSS on the amount of persons displayed versus the culture (please refer to appendix B for the SPSS output file). The person count varies from 0 to 3 in integer count. The chi-square test turns out significant, in which the null hypothesis is rejected for it scores a lower P

value than 0,000. In other words, the person count distribution is significantly differing between the Dutch and the Chinese image set.

Content results

The content results show some deviations, of which the largest contributor is the category animals. There are 64 percent more pictures displaying animals in the Dutch sample, whereas the object count is 43 percent lower than the Chinese sample. Landscapes are more often appearing in the Dutch sample, whereas plants are more often found in the Chinese sample. As can be seen in table 3.7, only the object count distribution is significantly differing enough to reject the null hypothesis. This yields a significant different distribution of only the category *objects*.

Table 3.7 Two tailed significance results of Chi-square test, per category

Category	2 sided asymptotic significance
Landscape	0,575
Animal	0,223
Plant	0,535
Object	0,001

Situational context

The situational context analysis yields the following result. Images are significantly more often found to be in family context in the Dutch sample: 81 per cent more than in the Chinese sample. The amount of images found to be possible taken in leisure context are comparable, equaling 142 in the Chinese and 143 in the Dutch sample. The amount of ambiguous situations is comparable as well, equaling 43 images for the Chinese sample and 45 for the Dutch sample. On a total of 200 images, this amount is significant and shows how many images are not exclusively to be determined to belong to just one social context. In other words, close to a fourth of all images could be misinterpreted or could be transmitting both social contexts and family contexts at the same time. The Chi square tests confirm this suspicion, as can be seen in table 3.8, in which only the family situations can be found to nearly surely reject the null hypothesis. The category work still has a 2,3 per cent of falsely rejecting the null hypothesis, whereas the category leisure for sure does not yield a significant difference. In other words, the amount of family is to be found significantly different, whereas the work distribution score

is rejected too based on a maximum level of 5 per cent. All of these results assume a correct visual recognition of the social context, of which the validity will be discussed later on in this chapter.

Table 3.8 Two tailed significance results of Chi-square test, per category of situational context

Category	2 sided asymptotic significance
Family	0,000
Work	0,023
Leisure	0,912

Content analysis significant results

The content analysis overall shows some clear differences. The collectivistic user seems to use more frequently objects and less frequently animals than the individualistic user does. Moreover, leisure is equally frequently used to communicate the concept of love, whereas in general many more images depicting two persons are generated and consumed by individualistic users. Moreover family situations are much more frequently used in public visual communication by individualistic culture. The discussion about the actual expression of the definition of love might actually be more thoroughly understood when recalling the difference between individualism and collectivism. Where individualism is partly characterised by privacy, the more frequent appearance of family might reveal a different definition or need for privacy between both cultures. Apparently the high public online exposure of family situations is not limited by feelings of privacy in the individualistic culture, which might as well indirectly state the opposite about collectivistic culture. The more similar both cultural stereotypes desire to publically express family situations, the more this dataset directly expresses the differently perceived definition of privacy between the two stereotypes instead of an actual difference in the content-wise preference of communication of the concept of love involving family. This question cannot be answered more thoroughly with the current results and would require additional research to reliably answer.

Concluding algorithms and content analysis

This section concludes the overall conclusions of this research, thereby combining the algorithm feature based conclusions and the content-driven conclusions. It connects the two in the light of the introduced theory from chapter one.

The typology of love constructed by Sternberg (1986) describes three constructs to describe the concept of love. In his definition, love consists of passion, commitment and intimacy, of which all of these constructs might have cultural functions in the actual perception and communication of these constructs. As the image database from the two differing cultural backgrounds shows differences in aesthetic constants in communicating love, it shows that the perception of love is possibly partly determined by a difference in generic aesthetic features like brightness, saturation and hue. It is found that the collectivistic culture uses a larger range of brightness, which proves the visual representation to be brighter. Moreover, the standard deviation of the brightness in collectivistic cultures is lower, which shows that on average these images have a lower contrast than the individualistically generated images. Moreover the saturation on average is lower in the collectivistic culture than in the individualistic, whereas the standard deviation of the saturation is equal in both cultures. For the hue or color tone, it can be concluded that the color tone use on average is different between the collectivistic and individualistic. The standard deviation turns out to be close to equal.

The content analysis yields large differences in the amount of persons represented in the images. Where the collectivistic culture uses less persons overall, the individualistic culture uses many more pictures of couples instead of single persons or groups to communicate love. In this case couples represent any two related persons whom are not friends. Furthermore, the amount of animals displayed by the individualistic data set is significantly higher, whereas objects are more popularly used in the collectivistic culture. Analyzing the sometimes ambiguous social situation of the image transferring love, many more family images are found in the individualistic data set. The amount of leisure situations turns out to not significantly differing.

Discussion

This section introduces perspective on the obtained results by comparing them to what is theory, as introduced by chapter one. In other words, it reviews the findings of both the visual features as well as the content analysis in the light of the first chapter: existing theories of interpersonal love and love towards objects and brands.

Interpersonal love expression, perception and privacy

Because the data set consists of images generated and consumed in a public fashion, all conclusions carry in itself the dimensions of expression, perception and privacy. Expression because the images show the love of the users, perception because it includes the vision of the user on the visual perception of love, whereas the definition of privacy is added because these images are publically shared. All three of these dimensions are dependent on cultural context.

Regarding the amount of persons on an image, one clearly sees on average more people to be present in a database with individualistic users. Then, the amount of groups and individuals displayed is larger in the collectivistic culture. The amount of groups being displayed being larger in the collectivistic culture might seem to be logical, since a more collectivistic culture might be assumed to express and their display more in group-fashion than an individualistic culture does. The significant difference in the amount of couples displayed, where the largest amount of couples displayed is in an individualistic culture, does however catch attention for its difference with a collectivistic culture. There are almost three times the amount of images displaying two persons in an individualistic culture than in a collectivistic culture. Which could be explained by several reasonings. Perhaps collectivistic cultures refrain from visually representing themselves as a couple on a social platform. It is also possible that it is less desired on average to represent love in an image using only two persons. Moreover, it might have to do with the constructs of love, in this case being passion. Whereas commitment and intimacy represent two out of three constructs of love, passion is the one commonly associated with expression. If one could regard sharing of visual content of couples as a passionate expression, one could deduce from this image set that passion is more often a reason, or more often desired to be shown on a public platform. In other words, either the individualistic culture causes the preference to represent human love more in couples instead of groups or individually, or the culture causes a difference in the behavior of online sharing human love. In the end, collectivistic culture might prefer to depict human love in couple fashion, but simply prefers not doing that on an online platform. The difference is in actual perception of interpersonal love, and in behavior when it comes to expression of this love. Individualistic cultures tend to rely more on privacy than collectivistic cultures (Gustavsson 2008), which seems to be consistent with the lack of a social context for romantic idealization in collectivistic cultures (Averill 1985). This could, as suggested before, indicate the definition of privacy

(and therefore public expression) to be unequal in the two cultural stereotypes. This research is not able to provide any further conclusions on this for the lack of focus on the perception of privacy between the two cultural stereotypes.

A second way of regarding the significant differences in persons displayed comes from the way people define themselves within a group. Whereas the individualistic culture might not have any difficulties publically displaying a couple, this might be less desired for in the collectivistic counterpart. The collectivistic culture might perceive a single displayed couple as an isolation from the group, instead of fitting into the group. Although there is no significant proof to be found in the results, the extreme difference of depicted couples and known differing attitude towards fitting in might hint for causes along these lines. The same might hold when realizing that, as yet introduced in chapter 1, collectivistic societies traditionally love and intimacy between a man and a woman is less important than other factors as a basis for marriage (Averill 1985). If this holds, then it would be confirmed by the data set, displaying less intimacy and love between couples. Again, this too would require further research to confirm that the difference is not in the desire to publically display this intimacy. In other words, the love and intimacy might be equally important or even more important, yet is possibly considered undesirable to be publically displayed.

Nonhuman content differences between collectivistic and individualistic cultures

This section elaborates on how the nonhuman content differs between the two cultural stereotypes and reviews this in the light of the theory presented in chapter one.

The two most significantly differing objects are the amount of objects, for which the individualistic set shows 43 per cent less objects. This could show how the collectivistic culture seems to more frequently involve an object in the expression of love. In first sight, this seems not to be supporting earlier findings about how objects are loved for reasons of self extension or symbolic benefits (Ahuvia e.a. 2006), or it might show how this is not used in communication amongst users. Again, this might show how the actual definition differs, or how the communication with the label of the translation of love occurs. In this case, the Dutch (or individualistic) users tend to use less objects to communicate love or to represent love. In other words, objects seem to play a less important role for showing love in individualistic cultures as in collectivistic cultures. Also when projected the amount of objects

displayed on the amount of persons displayed in the data set, the same pattern arises. 151 out of two hundred images in the Dutch data set show persons and 41 show an object, whereas the collectivistic data set shows 110 images with persons, and 72 in which objects are to be found. This shows that the individualistic image consumer and creator is more prone to depict couples in order to communicate a message of love, whereas its collectivistic counterpart is more prone to share single person images and group images.

Situational context and ambiguity

This section discusses the situational context of images in the database and the ambiguity it introduces. Firstly it discusses the ambiguity between leisure situation and family situation, and hereafter continues by discussing the results found. More than the statistical insignificance for some category of the data, there is a practical issue.

The difference between leisure and family context is not easily made. A leisure situation can be found in family context, and vice versa. The fact that a leisure context is situation that involves a family members inherently influences the information and therefore perception of what is being transferred. The second question arising is, what situation actually is determining for the image and how does this translate into the results? In other words, two brothers playing football might in western context be a leisure situation, but the fact that the persons playing football are brothers, does influence the perception of the image. In other words, it is confusing to draw conclusions on what actually on a perceptual level is the implication of this social context, of which the perceived importance is actually culturally dependent as well. Where for an individualistic researcher a family situation might not be the driving signifier for the two brothers playing football in a leisure situation, a collectivistic researcher might very well determine this to be a determining signifier. Concludingly, this categorization of situational context is by itself culturally dependent, which gives rise for many possible faulty perceived situations. Moreover, it is frequently not visible who are family members, which makes such an analysis very prone to errors, for which in this research there is introduced an acknowledgement for ambiguity: it is noted whenever a family situation could also be a leisure situation or vice versa: 43 and 45 social situation out of 200 are determined to ambiguous in the respectively Chinese and Dutch data set.

Ignoring the just mentioned situation of ambiguity, the following can be concluded based on the context analysis. A plus 81 per cent of images show family situations in the Dutch dataset. In other words, the Chinese (or collectivistic) users have a lot less tendency to depict family situations than its Dutch counterpart. Similarly to what was the case earlier with the person count, this difference might arise from difference in expression or acceptance of public exposure than from an actual difference in perception of the concept of love. The former option might be supported by the shared high occurrence of possibly leisure situations overall, since online publically exposing leisure situations is less demanding on privacy issues than family situations.

Verifications, validations, recommendations

When defending cultural research there is to be sufficient quantitative backup from the proper sources in order defend any result drawn. In other words, the data set used for this research has to be large enough to resemble an actual culture, and secondly it needs to be ensured how the data set was actually obtained from a group of online internet users that actually resemble that culture. This section will elaborate on the cultural background of the users that generated this data set and puts into perspective the amount of data used to defend the predictive power of this dataset.

Verification – Quantitative

This section introduces the verification issues about the research. In other words, it reviews the soundness of the research process itself.

Even though it is technically possible to represent all images with the word love, every research has its' practical limitations. In this case a single PC and internet connection prevented a data set to succeed the amount of roughly five thousand images per hashtag. In this case, there were downloaded four times roughly five thousand images hashtagged with the translation of the general assembly of love.

Upon selecting the translation of love this research attempted to find the most general translation of the concept of love. In other words, just like the English is able to consider in general love, or passionate love, affection, romantic love, the general concept connecting all these words is love. This general assembly concept of love is translated into three other languages: Chinese, Hungarian and Dutch. The table presented at the end of this section shows the total amount of images on Instagram

using these hashtags, and furthermore the fraction of this total amount represented by the data set in this research. The Hungarian translation of love has been used in hashtags in total about twenty thousand images, of which the latest 4500 (or close to 25 per cent) are represented in this research.

The hue, saturation and brightness parameters are parameters expressed in numbers. The cohesion between these numbers is determined by how pixel values are transformed into numbers by computers. As a result, the numbers obtained for the brightness, saturation and hue are numbers each having a specific formula. The construction of the picture into picture values carries with it certain limitations and particularities. An example is how the brightness automatically influences the saturation, something which might have been the case in the results for the Chinese data set of images. As the brightness of an image increases, the less possible it is to represent a color. In other words, an image can never have full brightness and full saturation, because this is theoretically impossible. For this reason, it will naturally be less probable to encounter very bright and highly saturated images, which does have its impact on the interpretation of the data. There are similar examples to be provided when it comes to saturation and hue, which all have their specific impacts on the numerical results. In order to fully understand the numerical results generated by these visual features, one requires proper understanding of the underlying numerical procedures that convert images to pixel values. The elaborate discussion of these procedures and implications is outside the scope of this research.

Validation - Culture resemblance

Where a sufficient quantity of images provides predictive power on the accuracy of the model, a properly recognized cultural background defends the validity of the results. For this reason, it is important to remember the initial question posed at the start of this reseach. All hypothesis are based on the differences between visual representation by individualistic and collectivistic cultures. In other words, in order to guarantee the validity of this research, the users contributing these images are to be proven to resemble either the collectivistic or individualistic culture. As a result, the more likely it is that solely users from the respective cultures have generated the images, the more likely the image set is to represent the actual attitudes towards visual creation and consumption.

The English language is spoken around the globe and not solely used by English native speakers. As English has become a universal language of trade and commerce, also the amount of online users using English to communicate and therefore hashtag increases. This pool of users might very well be expected to be predominantly (native) English speaking, that does not guarantee belonging to an individualistic or collectivistic society. Moreover it should be noted that the word *love* in English is the most used word to hashtag an image on Instagram. That might provide an additional accuracy on the visual representation of the English translation of love, it does however also support of a decreased reliability with respect to the cultural background of the users hashtagging images with love. For this reason the images hashtagged with love in English is used as a control set.

Dutch is officially spoken in one country in the world: the Netherlands. Whereas South Africa also has a large population speaking and communicating in the dutch, it is reasonable to assume that any image hashtagged with '*liefde'* is dutch and therefore a user in a predominantly individualistic culture, for it scores an eighty on the scale of individualism.

The written symbol for the general assembly of love in Chinese is not just used in China to represent love. It is used in countries like Taiwan, Japan, Thailand, and some other countries in the southeast-Asian cultural cluster. Luckily, all these countries share not only the symbol of love: they also share a fair amount of collectivistic cultures, according to Hofstede. A list with countries using the same word as Chinese do to represent the general assembly of love is presented at the end of this section, together with the scores in the dimension of collectivism. For this reason, even though it might not be reasonable to assume all the users hashtagging their images with the Chinese translation for love are actually Chinese, it is reasonable to assume that any user hashtagging with the Chinese translation represents a collectivistic culture, scoring on average below twenty on the dimension of individualism.

Hungarian has quite a particular position from a linguistic point of view, a property exploitable by this research. It is solely spoken in Hungary and the language resembles little commonalities with neighbouring countries nor with any other languages. For this reason, any image hashtagged with the word '*szerelem'* is bound to be from Hungarian origins, scoring an eighty on the scale of individualism according to Hofsteede, and therefore representing a predominantly individualistic society.

Methodology review

This section reviews the methodology and remarks that connect the methodology on a conceptual level to the practical limitations encountered in this research.

Content analysis

The content analysis part is tricky from two perspectives. The choices made with regard to the categories might on itself influence the research results, as the content analysis is done from an individualistic cultural perspective. Hence the perception of categorisation might be culturally dependent, thereby possible wrongly judging social contexts like family and leisure contexts. Moreover, the object-oriented analysis might not be relevant from a perception point of view, since individualistic cultures are by the definition more object-oriented than context-oriented (Masuda et al. 2008)[xxxviii], where in this case context-oriented is a different definition of content from the social context analysis. This context is the presence of visual information which is not the subject, whereas the social context analysis does not refer to the interplay between visual information of the subject and its surrounding but the social role pattern in which the situation can be categorised. In other words, researching the subjects presented in the image might by definition exclude valuable information for the collectivistic data set. Where an individualistic object-oriented research methodology attempts to find correlation between object usage or persons and other phenomenae, there exists the possibility that the collectivistic data set reveals more information by using visual information not by means of objects or just persons, like color patterns, perspective or shadows and highlight display.

Data set

The data set is coming from Instagram users. Next to many more implications, the main one is the determining characteristics of Instagram images and users. These users might be assumed the relatively active online and therefore might have converged with respect to cognition of visual information. This would imply that differences in practice, or amongst the whole group represented by the segment of Instagram users might have less converged. This would result in larger differences in the preferences and cognition than actually found in this methodology. Moreover, different data sources could be used than Instagram, for instance Tumblr, Flickr or Facebook. However every data source has its characteristics of user base and metadata, which influences the relevant dimensions of

validation to a large extent. The characteristics of the platform used to gather the data influences the type of research possibilities. Facebook users are more influenced by direct social environment than Tumblr, changing for instance the feeling of anonymousness, thereby being less or more influenced from social environment. Already in this research environment changing database platform characteristics would influence the research quite a bit, since Instagram offers relatively safe and protected expression and consumption of images, whereas a completely public platform like Tumblr has a different user-platform interaction.

The data set could be more thoroughly controlled on other images. Right now, this data sets with twenty thousand images definitely is defined by the transmittance of the idea of love. It could however provide additional insight when compared with other hashtags, like for instance emotionally neutral subjects in order compare how emotional expression influences visual features. Moreover, the constructs of love as defined by the triangle of love could be used to generate image sets, thereby enabling detection of differences in visual features when it comes to passion, intimacy and commitment. The more perception of visual features are alike across cultures, the more these comparisons across cultures are able to reveal the perception of the constructs of love on a cognitive level.

Long term view on visual research

In general, the methodological power is in the large amount of data in combination with automation. Whereas before statistics have been used to validate system hypothesis by means of sample representation, this is no longer required when switching to computable image features. As automated object recognition and visual feature recognition continues to evolve, more complicated image structures will become recognizable in automated fashion, therefore becoming applicable for researches like these. In fact, where the Imageplot now governs exploratory analysis, it can become a mean of validation when the visual feature recognition increases in reliability. Up till that moment, traditional techniques can be used in combination with the imageplots for exploration and validation, as has been shown in this research.

As visual images platforms will continue to grow in qualitative and quantitative sense, the possibilities for the type of research questions and relevance of information will increase as well. With an

increasing amount of metadata being available, my expectation is that it will become soon very profitable to become more creative in combining methodologies from different fields. Where traditional image analysis is usually barely automated, a combination of images and metadata might perform these jobs in the future, thereby endlessly expanding the opportunities of visual research. Metadata like image category, hashtags, user rating, user commentaries, user culture, follow up posts, GPS-locations can be smartly combined to reveal increasingly complex information not only regarding image recognition itself, but also the cultural information and possibly trends governed by the image in combination with the metadata, in database form. Any manual step to be taken within such researches should be avoided, for the growth of absolute amount of data will for sure overtake the absolute capacity to manually keep up with analyzing the content, such that a sufficiently validated research is the result. To extend this line of reasoning, it might be more promising to adapt research hypothesis, methods and rationales that allow for automation, whilst continuing to improve automated visual recognition of features currently still manually performed.

Appendix A – SPSS output aesthetic statistics

Oneway

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Descriptives

		N	Mean	Std. Deviation	Std. Error
brightness_median	1	4520	145,51	57,623	,857
	2	4392	153,37	60,758	,917
	3	6065	149,09	54,904	,705
	4	5520	168,16	62,681	,844
	Total	20497	154,35	59,580	,416
saturation_median	1	4520	78,41	50,677	,754
	2	4392	68,72	49,905	,753
	3	6065	70,32	45,707	,587
	4	5520	62,80	52,387	,705
	Total	20497	69,74	49,867	,348
hue_median	1	4520	80,30	71,664	1,066
	2	4392	75,72	68,124	1,028
	3	6065	75,09	67,874	,872
	4	5520	68,58	67,212	,905
	Total	20497	74,62	68,726	,480

Descriptives

		95% Confidence Interval for Mean		Minimum	Maximum
		Lower Bound	Upper Bound		
brightness_median	1	143,83	147,19	0	255
	2	151,57	155,16	0	255
	3	147,71	150,47	0	255
	4	166,51	169,82	0	255
	Total	153,54	155,17	0	255
saturation_median	1	76,93	79,89	0	255
	2	67,24	70,19	0	255
	3	69,17	71,47	0	255
	4	61,42	64,18	0	255
	Total	69,05	70,42	0	255
hue_median	1	78,21	82,39	0	250
	2	73,70	77,73	0	253
	3	73,38	76,80	0	252
	4	66,81	70,35	0	253
	Total	73,68	75,56	0	253

ANOVA

		Sum of Squares	df	Mean Square
brightness_median	Between Groups	1578808,049	3	526269,350
	Within Groups	71177839,547	20493	3473,276
	Total	72756647,596	20496	
saturation_median	Between Groups	612655,454	3	204218,485
	Within Groups	50355826,637	20493	2457,221
	Total	50968482,091	20496	
hue_median	Between Groups	353685,853	3	117895,284
	Within Groups	96454074,387	20493	4706,684
	Total	96807760,240	20496	

ANOVA

		F	Sig.
brightness_median	Between Groups	151,520	,000
	Within Groups		
	Total		
saturation_median	Between Groups	83,110	,000
	Within Groups		
	Total		
hue_median	Between Groups	25,048	,000
	Within Groups		
	Total		

Post Hoc Tests

Multiple Comparisons

LSD

Dependent Variable	(I) COUNTRY	(J) COUNTRY	Mean Difference (I-J)	Std. Error	Sig.
brightness_median	1	2	-7,859	1,249	,000
		3	-3,580*	1,158	,002
		4	-22,655*	1,182	,000
	2	1	7,859	1,249	,000
		3	4,279*	1,168	,000
		4	-14,797*	1,192	,000
	3	1	3,580	1,158	,002
		2	-4,279*	1,168	,000
		4	-19,075*	1,096	,000
	4	1	22,655	1,182	,000
		2	14,797*	1,192	,000
		3	19,075*	1,096	,000
saturation_median	1	2	9,696	1,050	,000
		3	8,092*	,974	,000
		4	15,615*	,994	,000
	2	1	-9,696	1,050	,000
		3	-1,604	,982	,102
		4	5,919*	1,002	,000
	3	1	-8,092	,974	,000
		2	1,604	,982	,102
		4	7,523*	,922	,000
	4	1	-15,615	,994	,000
		2	-5,919*	1,002	,000
		3	-7,523*	,922	,000
hue_median	1	2	4,583	1,454	,002
		3	5,208*	1,348	,000
		4	11,718*	1,376	,000
	2	1	-4,583	1,454	,002
		3	,625	1,359	,646
		4	7,135*	1,387	,000
	3	1	-5,208	1,348	,000
		2	-,625	1,359	,646
		4	6,510*	1,276	,000
	4	1	-11,718	1,376	,000
		2	-7,135*	1,387	,000
		3	-6,510*	1,276	,000

*. The mean difference is significant at the 0.05 level.

Multiple Comparisons

LSD

Dependent Variable	(I) COUNTRY	(J) COUNTRY	95% Confidence Interval	
			Lower Bound	Upper Bound
brightness_median	1	2	-10,31	-5,41
		3	-5,85	-1,31
		4	-24,97	-20,34
	2	1	5,41	10,31
		3	1,99	6,57
		4	-17,13	-12,46
	3	1	1,31	5,85
		2	-6,57	-1,99
		4	-21,22	-16,93
	4	1	20,34	24,97
		2	12,46	17,13
		3	16,93	21,22
saturation_median	1	2	7,64	11,75
		3	6,18	10,00
		4	13,67	17,56
	2	1	-11,75	-7,64
		3	-3,53	,32
		4	3,95	7,88
	3	1	-10,00	-6,18
		2	-,32	3,53
		4	5,72	9,33
	4	1	-17,56	-13,67
		2	-7,88	-3,95
		3	-9,33	-5,72
hue_median	1	2	1,73	7,43
		3	2,57	7,85
		4	9,02	14,42
	2	1	-7,43	-1,73
		3	-2,04	3,29
		4	4,42	9,85
	3	1	-7,85	-2,57
		2	-3,29	2,04
		4	4,01	9,01
	4	1	-14,42	-9,02
		2	-9,85	-4,42
		3	-9,01	-4,01

Oneway

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Descriptives

		N	Mean	Std. Deviation	Std. Error
brightness_median	,00	14977	149,26	57,568	,470
	1,00	5520	168,16	62,681	,844
	Total	20497	154,35	59,580	,416
saturation_median	,00	14977	72,29	48,659	,398
	1,00	5520	62,80	52,387	,705
	Total	20497	69,74	49,867	,348
hue_median	,00	14977	76,85	69,145	,565
	1,00	5520	68,58	67,212	,905
	Total	20497	74,62	68,726	,480

Descriptives

		95% Confidence Interval for Mean		Minimum	Maximum
		Lower Bound	Upper Bound		
brightness_median	,00	148,34	150,18	0	255
	1,00	166,51	169,82	0	255
	Total	153,54	155,17	0	255
saturation_median	,00	71,51	73,07	0	255
	1,00	61,42	64,18	0	255
	Total	69,05	70,42	0	255
hue_median	,00	75,74	77,95	0	253
	1,00	66,81	70,35	0	253
	Total	73,68	75,56	0	253

ANOVA

		Sum of Squares	df	Mean Square
brightness_median	Between Groups	1440930,057	1	1440930,057
	Within Groups	71315717,540	20495	3479,664
	Total	72756647,596	20496	
saturation_median	Between Groups	363616,696	1	363616,696
	Within Groups	50604865,394	20495	2469,132
	Total	50968482,091	20496	
hue_median	Between Groups	275513,440	1	275513,440
	Within Groups	96532246,800	20495	4710,039
	Total	96807760,240	20496	

ANOVA

		F	Sig.
brightness_median	Between Groups	414,100	,000
	Within Groups		
	Total		
saturation_median	Between Groups	147,265	,000
	Within Groups		
	Total		
hue_median	Between Groups	58,495	,000
	Within Groups		
	Total		

Appendix B – SPSS output Content analysis statistics

Crosstabs

[DataSet0]

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
culture * amount	400	100,0%	0	,0%	400	100,0%

culture * amount Crosstabulation

Count

		amount				Total
		,00	1,00	2,00	3,00	
culture	,00	50	42	82	26	200
	1,00	90	51	28	31	200
Total		140	93	110	57	400

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	39,247[a]	3	,000
Likelihood Ratio	40,593	3	,000
Linear-by-Linear Association	15,289	1	,000
N of Valid Cases	400		

a. 0 cells (,0%) have expected count less than 5. The mini mum expected count is 28,50.

Crosstabs

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ASSEGNAZIONI_2015\HUGO\data_content.sav

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
1=chinese; 0=dutch * landscape	400	100,0%	0	,0%	400	100,0%

```
        1= chinese; 0=dutch * landscape Crosstabulation
```
Count

| | | landscape | | Total |
		,00	1,00	
1=chinese; 0=dutch	,00	168	32	200
	1,00	172	28	200
Total		340	60	400

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1 sided)
Pearson Chi-Square	,314[a]	1	,575		
Continuity Correction [b]	,176	1	,674		
Likelihood Ratio	,314	1	,575		
Fisher's Exact Test				,675	,337
Linear-by-Linear Association	,313	1	,576		
N of Valid Cases	400				

a. 0 cells (,0%) have expected count less than 5. The mini mum expected count is 30,00.

b. Computed only for a 2x2 table

Crosstabs

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Case Processing Summary

| | Cases | | | | | |
| | Valid | | Missing | | Total | |
	N	Percent	N	Percent	N	Percent
1=chinese; 0=dutch * animal	400	100,0%	0	,0%	400	100,0%

```
        1= chinese; 0=dutch * animal Crosstabulation
```
Count

| | | animal | | | Total |
		,00	1,00	2,00	
1=chinese; 0=dutch	,00	177	22	1	200
	1,00	186	14	0	200
Total		363	36	1	400

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3,001[a]	2	,223
Likelihood Ratio	3,402	2	,182
Linear-by-Linear Association	2,741	1	,098
N of Valid Cases	400		

a. 2 cells (33,3%) have expected count less than 5. The minimum expected count is ,50.

Crosstabs

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Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
1=chinese; 0=dutch * plant	400	100,0%	0	,0%	400	100,0%

`1= chinese; 0=dutch * plant Crosstabulation`

Count

		plant		Total
		,00	1,00	
1=chinese; 0=dutch	,00	189	11	200
	1,00	186	14	200
Total		375	25	400

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1 sided)
Pearson Chi-Square	,384[a]	1	,535		
Continuity Correction[b]	,171	1	,680		
Likelihood Ratio	,385	1	,535		
Fisher's Exact Test				,680	,340
Linear-by-Linear Association	,383	1	,536		
N of Valid Cases	400				

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 12,50.

b. Computed only for a 2x2 table

Crosstabs

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Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
1=chinese; 0=dutch * object	400	100,0%	0	,0%	400	100,0%

1= chinese; 0=dutch * object Crosstabulation

Count

		object		
		,00	1,00	Total
1=chinese; 0=dutch	,00	159	41	200
	1,00	128	72	200
Total		287	113	400

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1 sided)
Pearson Chi-Square	11,853[a]	1	,001		
Continuity Correction[b]	11,100	1	,001		
Likelihood Ratio	11,969	1	,001		
Fisher's Exact Test				,001	,000
Linear-by-Linear Association	11,823	1	,001		
N of Valid Cases	400				

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 56,50.

b. Computed only for a 2x2 table

Crosstabs

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1= chinese; 0=dutch * family Crosstabulation

Crosstabs

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
1=chinese; 0=dutch * family	400	100,0%	0	,0%	400	100,0%

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Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
1=chinese; 0=dutch * work	400	100,0%	0	,0%	400	100,0%

1= chinese; 0=dutch * work Crosstabulation

Count

		work		Total
		,00	1,00	
1=chinese; 0=dutch	,00	193	7	200
	1,00	182	18	200
Total		375	25	400

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5,163[a]	1	,023		
Continuity Correction[b]	4,267	1	,039		
Likelihood Ratio	5,332	1	,021		
Fisher's Exact Test				,037	,018
Linear-by-Linear Association	5,150	1	,023		
N of Valid Cases	400				

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 12,50.

b. Computed only for a 2x2 table

Crosstabs

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Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
1=chinese; 0=dutch * leasure	400	100,0%	0	,0%	400	100,0%

```
1= chinese; 0=dutch * leasure Crosstabulation
```

Count

		leasure		Total
		,00	1,00	
1=chinese; 0=dutch	,00	57	143	200
	1,00	58	142	200
Total		115	285	400

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,012[a]	1	,912		
Continuity Correction[b]	,000	1	1,000		
Likelihood Ratio	,012	1	,912		
Fisher's Exact Test				1,000	,500
Linear-by-Linear Association	,012	1	,912		
N of Valid Cases	400				

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 57,50.

b. Computed only for a 2x2 table

[i] *'A Triangular Theory of Love'*, Sternberg, R.J., 1986, Psychological Review, nr. 2, page 119-135

[ii] Aron, A. & Aron, E.N., 1986, Love as the expansion of the self: Understanding attraction and satisfaction, New York: Hemisphere

[iii] *'The new psychology of Love'*, Sternberg, R.J., Weis, K., 2006, Yale University Press

[iv] *'Construct validation of a triangular love scale'*, Sternberg, R.J., 1997, European Journal of Social Psychology, nr. 27, page 313-335

[v] *'I love it! Towards a unifying theory of love across diverse love objects'*, Ahuvia, A., 1993, working paper #718

[vi] *'Beyond the Extended Self: Loved Objects and Consumers' Identity Narratives'*, Ahuvia, A.C., 2005, Journal of Consumers Research, nr. 32, page 171-183

[vii] Belk, Russel W., 1988, Possessions and the Extended Self", Journal of Consumer Research, nr. 15, page 139-168

[viii] *'Some antecedents and outcomes of brand love'*, Ahuvia, A.C., Carrol, A.C., 2006, Springer Science and Business Media, Inc.

[ix] *'When consumers love their brands: Exploring the concept and its dimensions'*, Albert, N., Merunka, D., Valette-Florence, P., 2007, Journal of Business Research

[x] *'Brand love'*, Batra, R., Ahuvia, A., Bagozzi, R.P., 2012, American Marketing Association, nr. 76, page 1-16

[xi] *'What individualism is and is not'*, Gustavsson, G., 2008, Workshop paper at the NOPSA Conference 2008

[xii] *'From Plato to Putnam: Four ways to think about hate'*, Royzman, E. McCauley, C.R., Rozin, P., 2004, The psychology of hate (Sternberg, R.J.), page 3-35

[xiii] *'Culture and the Self: Implications for Cognition, Emotion, and Motivation'*, Markus, H.R., Kitayama, S., 1991, Psychological Review, nr. 2, p224-253

[xiv] Averill, J. R. (1985) The social construction of emotion: With special reference to love. In K. J.

[xv] *'Individualistic and Collectivistic Perspectives on Gender and the Cultural Context of Love and Intimacy'*, Dion, K.K., Dion, K.L., 1993, Journal of Social Issues, nr. 3, p53-69

[xvi] Hsu, K L. K. (1981) Americans and Chinese: Passage to differences (3rd ed). Honolulu, HW; The

University Press of Hawaii.

[xvii] *'Culture and the Self: Implications for Cognition, Emotion, and Motivation'*, Markus, H.R., Kitayama, S., 1991, Psychological Review, nr. 2, p224-253

[xviii] *'A Triangular Theory of Love'*, Sternberg, R.J., 1986, Psychological Review, nr. 2, page 119-135

[xix] *'Culture and the Self: Implications for Cognition, Emotion, and Motivation'*, Markus, H.R., Kitayama, S., 1991, Psychological Review, nr. 2, p224-253

[xx] *'Possessions and the Extended Self'*, Belk, Russel W., 1988, ' Journal of Consumer Research, nr. 15, page 139-168

[xxi] Averill, J. R. (1985) The social construction of emotion: With special reference to love. In K. J.

[xxii] Mesquita, B., 2001, Emotions in Collectivist and Individualist Contexts, Wake Forest University

xxiii Sampson, E.E., 1985, Decentralization of identity: Toward a revised concept of personal and social order, *American Psychologist*, nr.40, p1203-1211

xxiv Bellah, R.N., Madsen, R., Sullivan, W.M., Swidler, A., Tipton, S.M., 1985, Habits of the heart: Individualism and commitement in American life, Berkeley: University of California Press

xxv Aron, A. & Aron, E.N., 1986, Love as the expansion of the self: Understanding attraction and satisfaction, New York: Hemisphere

xxvi Zhu, Y., Zhang, L., Fan. J., Han, S., 2007, Neural basis of cultural influence on self-reprecentation

xxviii Masuda, T., Gonzalez, R., Kwan, L., Nisbett, R.E., 2008, *Culture and aesthetic preference: comparing the attention to context of East Asians and Americans,* Personality and Social Psychology Bulletin, nr 34, p1260-1275

xxix '*Some antecedents and outcomes of brand love'*, Ahuvia, A.C., Carrol, A.C., 2006, Springer Science and Business Media, Inc.

xxx '*When consumers love their brands: Exploring the concept and its dimensions'*, Albert, N., Merunka, D., Valette-Florence, P., 2007, Journal of Business Research

xxxi *'Brand love'*, Batra, R., Ahuvia, A., Bagozzi, R.P., 2012, American Marketing Association, nr. 76, page 1-16

xxxii '*Contextual and thematic analyses of soureces of provisional meaning: A life-span perspective'*, Reker, G.T., 1991, paper presented at the Biennial Meeting of the International Socieety for the Study of Bevioral Development
xxxiii '*Individualistic and Collectivistic Perspectives on Gender and the Cultural Context of Love and Intimacy'*, Dion, K.K., Dion, K.L., 1993, Journal of Social Issues, nr. 3, p53-69

xxxiv *'Cultural analytics: Visualising Cultural Patterns in the Era of "More Media"'*, Manovich, L., 2008, online article

xxxv '*Visualising temporal patterns in visual media'*, Manovich, L., 2009, online article

xxxvi *'Cultural analytics at work'*, Manovich, L, 2011, online article
xxxvii '*Software takes command'*, Manovich, L., 2013, e-book, volume 5

xxxviii Masuda, T., Gonzalez, R., Kwan, L., Nisbett, R. (2008), *Culture and Aesthetic Preference*, Society for Personality and Social Psychology, Inc.

Bibliography

Ahuvia, A., 'I love it! Towards a unifying theory of love across diverse love objects', 1993, working paper #718

Ahuvia, A.C., 'Beyond the Extended Self: Loved Objects and Consumers' Identity Narratives', 2005, Journal of Consumers Research, nr. 32, page 171-183

Ahuvia, A.C., Carrol, A.C., 'Some antecedents and outcomes of brand love', 2006, Springer Science and Business Media, Inc.

Albert, N., Merunka, D., Valette-Florence, P., 'When consumers love their brands: Exploring the concept and its dimensions', 2007, Journal of Business Research

Aron, A. & Aron, E.N., 'Love as the expansion of the self: Understanding attraction and satisfaction', 1986, New York: Hemisphere

Averill, J. R. (1985) The social construction of emotion: With special reference to love. In K. J.

Batra, R., Ahuvia, A., Bagozzi, R.P., 'Brand love', 2012, American Marketing Association, nr. 76, page 1-16

Belk, Russel W., 'Possessions and the Extended Self', 1988, Journal of Consumer Research, nr. 15, page 139-168

Bellah, R.N., Madsen, R., Sullivan, W.M., Swidler, A., Tipton, S.M., 'Habits of the heart: Individualism and commitment in American life', 1985, Berkeley: University of California Press

Dion, K.K., Dion, K.L., 'Individualistic and Collectivistic Perspectives on Gender and the Cultural Context of Love and Intimacy', 1993, Journal of Social Issues, nr. 3, p53-69

Gustavsson, G., 'What individualism is and is not', 2008, Workshop paper at the NOPSA Conference 2008

Hsu, K L. K. (1981), 'Americans and Chinese: Passage to differences' (3rd ed). Honolulu, HW; The University Press of Hawaii

Manovich, L, 'Cultural analytics at work', 2011, online article retrieved on 20/03/2015

Manovich, L., 'Cultural analytics: Visualising Cultural Patterns in the Era of "More Media"', 2008, online article retrieved on 20/03/2015

Manovich, L., 'Software takes command', 2013, e-book, volume 5

Manovich, L., 'Visualising temporal patterns in visual media', 2009, online article retrieved on 21/03/2015

Markus, H.R., Kitayama, S., 'Culture and the Self: Implications for Cognition, Emotion, and Motivation', 1991, Psychological Review, nr. 2, p224-253

Masuda, T., Gonzalez, R., Kwan, L., Nisbett, R.E., 'Culture and aesthetic preference: comparing the attention to context of East Asians and Americans', 2008, Personality and Social Psychology Bulletin, nr 34, p1260-1275

Mesquita, B., 2001, 'Emotions in Collectivist and Individualist Contexts', Wake Forest University

Reker, G.T., 'Contextual and thematic analyses of sources of provisional meaning: A life-span perspective', 1991, paper presented at the Biennial Meeting of the International Socieety for the Study of Bevioral Development

Royzman, E. McCauley, C.R., Rozin, P., 'From Plato to Putnam: Four ways to think about hate', 2004, The psychology of hate (Sternberg, R.J.), page 3-35

Sampson, E.E., 1985, 'Decentralization of identity: Toward a revised concept of personal and social order', American Psychologist, nr.40, p1203-1211

Sternberg, R.J., 'A Triangular Theory of Love', 1986, Psychological Review, nr. 2, page 119-135

Sternberg, R.J., 'Construct validation of a triangular love scale', 1997, European Journal of Social Psychology, nr. 27, page 313-335

Sternberg, R.J., Weis, K., The new psychology of Love', 2006, Yale University Press

Zhu, Y., Zhang, L., Fan. J., Han, S., 'Neural basis of cultural influence on self-representation', 2007, Elsevier, NeuroImage 34