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Abstract

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Keywords

Culturometrics, Humanistic Research Methods, Qualitative Measurement, Self-Norming, Q Methodology, Cultural Studies, Cultural Identity, CommittedCommunication, Constructionism

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Culturometrics: A Constructionist Philosophy for Humanistic Inquiry in Qualitative Identity Research

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Culturometrics is a new person-centred research philosophy that has shaped new tools for measuring and revealing the subjectivities of cultural identities. By focusing on tractable processes of identity communication rather than attempting to categorise the infinitely variable forms of identity outcomes it has developed intuitively acceptable computationally simple bridges across the qualitative /quantitative research divide. By reframing social constructs as cultural identities and categorising cultural groups by the fluidity of their membership it has extended the remit of traditional qualitative research. This paper gives a brief overview of the humanistic intentions of Culturometrics that underpin its objective methods for measuring and revealing the rich subjectivities of cultural identity. The paper demonstrates one of the self-norming processes that regulate personal expectations allowing subjective self-evaluations of identity to be compared. It demonstrates efficient two-phase etic/emic social network sampling of cultural groups and effective contrast interviewing for revealing the unique values, attitudes, beliefs and intentions that define cultural Identity in specific research contexts. Keywords: Culturometrics, Humanistic Research Methods, Qualitative Measurement, Self-Norming, Q Methodology, Cultural Studies, Cultural Identity, Committed Communication, Constructionism

Introduction

This paper introduces a novel Culturometric methodology first developed to investigate ethnic values in a four-year ethnographic study in Fiji (Boufoy-Bastick, 2002, p. 39; 2007, p. 10; 2010, p. 518; 2013, p. 53). Culturometrics is a novel approach to qualitative inquiry in cultural identity that aims to promote diversity through dynamics of cultural change for those who want to change and to support the maintenance of cultural stability for those who don't. Culturometrics is a set of postmodern, person-centered strategies that enable researchers to measure cultural identity components of individuals and of groups. The anchors of its bi-polar dimension of interest are change and stability. Hence, its processes are concerned with the fluidity of individual identities – as in the identity negotiations of *Committed Communication* (Boufoy-Bastick, 2012a, pp. xxi–xxix). To this end, Culturometrics operationally defines "cultural identity" as "values in context" and so offers measures of cultural identity that enable such changes to be identified and quantified. This paper gives a very brief derivation and overview of the Culturometric humanist methodology and presents two of the procedural Culturometric techniques, vis. network sampling and the "celebrity questionnaire."

Culturometrics: A constructionist philosophy for
humanistic inquiry in Cultural Studies

What is Culturometrics?

Culturometrics is a humanist constructionist philosophy concerned with who we are and how we change (Boufoy-Bastick, 2012b, p. 78; 2013, p. 55; Floridi, 2011, p. 282; Gergen, 1994, p. 207; Kotarba & Fontana, 1987, p. 11, p. 49). Its orientation to scientific research is determinedly humanistic in reaching for the human fulfilment at the peak of Maslow's motivational pyramid of life's needs (Maslow, Frager & Fadiman, 1970). Within this ideological framework, Culturometrics offers measures of cultural identity that enable such changes to be identified and quantified so that associated causes and influences may be researched. By focusing on the flux and flow of cultural identity, Culturometrics makes this more tractable through its emphasis on the language of process rather than of object – as in its reframing of social constructs as cultural identities and in its definition of "cultural identity" being "values in context."

What does a Culturometric researcher do when they are conducting a culturometric study?

To explain simply what a culturometric researcher does in conducting a study, we briefly enumerate the four practical steps to be followed. The researcher:

(i)   Frames the construct they want to measure in terms of cultural identity;
(ii) Uses the culturometric two-phase etic/emic social network sampling, explained below, to identify people who are emically high and emically low on that construct by using the Cultural Index (Boufoy-Bastick, 2002, 2007).
(iii) Identifies and measures the cultural index of individuals who are high and low on that construct by applying cultural index regulator;
(iv) Selects the highest and the lowest persons showing that cultural identity through the analysis of the Cultural Index and uses contrast interviewing to expound the emic meanings and contexts of the construct

Humanistic foundations of Culturometric research methodology

Culturometric methodology is anchored in humanistic principles as indicated above and has three coextensive aims guiding its congruence with this philosophical doctrine: (i) Empowering participants, (ii) Appreciating diversity and (iii) Enhancing potential for identity change or stability.

(i)   Culturometrics promotes participant empowerment by employing research methods specifically designed to acknowledge each participant's authority to define who they are and the authority of their cultural group to authenticate their cultural identity.

(ii)   Culturometrics promotes appreciation of diversity as a positive affirmation of acceptance which can be either personal or public. Thus, the methods of Culturometrics are designed to be suitable for applications that increase personal and public appreciation of diversity and applications that support protection policies for those who wish to maintain the cultural identities they have chosen.

(iii)   The methods of Culturometrics maintain the individual's cultural identity as the unit of analysis and are designed to be suitable for applications that can enhance potential for identity change. Culturometrics is premised on individual freedom to change and on openness towards change and stability according to the quality of one's group membership.

Humanist methods for objective comparisons of inter-subjectivities

Bridging the qualitative-quantitative divide

A problem posed by the humanists and now being resolved by Culturometrics is how to bring the rigour of scientific/objective research methodology to disciplines, and subject areas (Baldwin et al., 2004, p. 41) so profoundly epitomised by their inextricably rich and indefinable intra-subjectivities and inter-subjectivities.

In 1966 the psychologist Abraham Maslow explicated that although

The model of science in general, inherited from the impersonal sciences of things, objects, animals, and part-processes, is limited and inadequate when we attempt to know and to understand whole and individual persons and cultures….there is no "alternative model yet been offered to deal validly with the fully human person." (Maslow, 1966, p. iv)

Culturometrics seeks to close the qualitative-quantitative gap with innovative and eclectic humanistic methods which include intuitively acceptable and computationally understandable self-norming methods objectively grounded in consensus subjectivities of selected cultural groups (Boufoy-Bastick, 2010, p. 95).

Researching human inter and intra-subjectivities

"Objectivity" is basically what can be confirmed, e.g. by the agreement of observers who experience the same thing; whereas subjectivity cannot be so confirmed, usually because the same subjectivity cannot be sufficiently experienced and so confirmed by many observers. An example of objectivity is how much you weigh on a particular weighing machine. This result, of you on a weighing machine, can be confirmed by other observers who see the same result as you see when you get on those scales. A related example of subjectivity is how you feel about what you weigh. We cannot tell if the observers, watching you get on the scales, can experience exactly what you feel inside, and so be in a position to confirm your feelings. It is most probable that another cannot exactly know your inner pains and pleasures. Abraham Maslow made this distinction as "Experiential Knowledge and Spectator Knowledge" in his chapter 6 of *The Psychology of Science*.

Many things in life cannot be transmitted well by words, concepts, or books. Colors that we see cannot be described to a man born blind. Only a swimmer knows how swimming feels; the non-swimmer can get only the faintest idea of it with all the words and books in the world. The psychopath will never know the happiness of love. The youngster must wait until he is a parent in order to know parenthood fully and to say "I didn't realize." My toothache feels different from your toothache. And so it goes. (Maslow, 1966)

It is interesting that generally objective situations tend not to be so fruitful for significant research as subjective situations can be. This is because what we can know about objective situations is gleaned relatively easily by simple observation. The research on objective situations is usually a faithful counting or recording of the observations. However, "Not everything that can be counted counts, and not everything that counts can be counted" (attributed to Albert Einstein). In contrast, subjective situations do tend to make for more significant research, not least because we do not have currently the research tools to completely unveil their mysteries (Boufoy-Bastick, 2012a, p. lxv). As Elspeth Probyn observes in the 2007 Working Papers of the Centre for Contemporary Cultural Studies "we have yet to rebuild a method of research that effectively grasps networks of human inter- and intra-subjectivity" (Centre for Contemporary Cultural Studies, 2007, p. 432). So, what we, in Culturometrics, do to help resolve these issues is use methods that mediate subjectivities to allow objective research, faithful counting or recording, but of subjective situations so that we can all know more about them. As applied to the anthropological study of culture, this goes some way to fulfilling Max Weber's original anti-positivist agenda of *Verstehen* (Runciman, 1978). We can never completely know the emic subjectivity of another, for we are not them. Research communications, however, do endeavour to evoke our sympathetic etic understandings through veracious experience educed by various interpretations of symbolic representations of these subjectivities (Boufoy-Bastick, 2004; Harris, 2001). In this respect, Culturometrics is only a facilitator of applied research to uncover our subjectivities, objectively identifying, mediating and measuring subjectivities that cannot be completely known so that, having identified and measured them, researchers can enquire further into their meanings, their causes and how they change.

We next address a possible process vs. outcome confusion that seems to arise and widen the qualitative-quantitative researchers' gap when qualitative researchers contemplate the objective measurement of inter-subjectivities such as the communication of cultural identities. We particularly note that it encourages misconceptions to believe that one must understand a construct before one can measure it – this had been alluded to by Campbell, Converse and Rodgers (1976) who remarked that the insertion of subjective indicators draws criticism from some observers because they are "soft" measures and "we do not know what they mean." (p. 475). In fact, one need only be able to recognise a construct in order to measure it. We do not need to understand more than that about a construct in order to measure it. In illustration, we are surrounded by instruments that measure constructs that we do not understand. To be more precise, we are surrounded by instruments that measure pseudo-indicators of constructs that we do not understand. We recognise that the pseudo-indicators change with different states of the construct and so we can use them as measures. For example, body temperature is not the length of mercury in a tube. The length of mercury in the tube is a pseudo-indicator of the possible malfunctioning of complex homeostatic body processes which are not completely understood. The clock on the wall is a pseudo-indicator that measures the passing of time – but what is time and how does it "pass?" Similarly, a subject's cultural identity is complex subjectivity that we can recognise but never completely know. Culturometrics uses pseudo-indicators to measure Cultural Identity (CId). It makes no claim to understand CId in order to measure it. The purpose of this measurement is to identify strong/weak CIds, differences in CId, and changes in CIds so that these situations can be researched to better understand the meanings of specific cultural identities and compare subjective self-evaluations of identity. For the application reported in this paper the measurement of CIds is used to identify respondents with strong or weak CIds so that contrast interviewing can be used to better understand the meanings of their cultural identities.

Humanistic empowerment of participants through self-authentication of Identity: Getting from the "Who I am" to "Who we are"

Thus far, we have considered the cultural identity of individuals and the cultural identity of groups. Here, we simply note the most parsimonious system dynamics of group membership/exclusion and associated objective measures of social distance/proximity for the formation and relation of cultural groups in relation to their membership.

Self-norming processes for a radical constructivist definition of individuals' cultural identities

Culturometrics uses intuitively acceptable and computationally transparent innovative humanistic self-norming processes as demonstrated in the Celebrity Questionnaire[1] presented below. Culturometric self-norming is innovative because it contrasts with the assumptions, impositions and processing of previous traditional questionnaires and it is humanistic because in contrast to traditional questionnaires the Celebrity Questionnaire empowers the individuals and their cultural group(s). These self-norming culturometric processes are continually being developed that maintain the unit of analysis at the level of the individual person's cultural identity. In other words, "each person is compared to his or her personal standards, which are then grounded in the consensus values of their cultural group" (Boufoy-Bastick, 2013, p. 66). Within this framework the Celebrity Questionnaire asks for two responses on the same scale. As with traditional questionnaires, both responses are influenced by the same unknown

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[1] The Celebrity Questionnaire uses intuitively acceptable self-norming processes. It requires two questions. The first question invites subjective evaluation Q2 of a celebrity on a shared characteristic on a Visual Analogue Scale. The high complexity of the task (many ill-defined variables involved), short time allowed for response, the low risk of being wrong and the VAS (size perception and cross-modal comparisons replacing more analytical numeric assessment) all encourage an almost immediate integrative cognitive-affective response. This is an intuitive assessment and corresponding intuitive response. The second question utilises the emotional sets evoked by the first question. There is no unpleasant change in response set as with traditional reversed scored questions. The second question repeats the same intuitive process of evaluation and response, which is re-assuring, and encourages potentially pleasant partial identification with a celebrity. Hence, the secure repeat process and pleasant partial identification would tend to make this intuitive evaluation and response acceptable intuitive processes. In addition, placing the two responses on the same scale intuitively encourages the use of the same emotional sets of values for both evaluations. Further, the relative juxtaposition of the two completed responses to each other and to the picture of the celebrity, are readily perceived as Gestalt insight of personal self-awareness in terms of similarities and differences of self and celebrity with the accompanying pleasurably feelings of closure.

Culturometric self-norming is also computationally transparent. 'Computationally transparent' means here (i) the arithmetic is relatively simple and (ii) the process of the arithmetic understandable matches the function for which it is being used. There are three arithmetic processes used in this self-norming, a division, an average and a multiplication. These match the processes of self-norming, finding the group consensus and calculating the respondent's final Cultural Index respectively.

Compared to the mathematical ossifications of traditional statistical manipulation of responses that claim to achieve meaning through intra-group and inter-group comparisons, e.g. common Rasch models, this simple division and multiplication is clear to most qualitative researchers. Further, each calculation is simply and directly linked by its understandable function to its intended purpose. That is (i) the division of Q1 by Q2 clearly cancels out the personal unknown subjective expectations to give the respondent's value as a more objective fraction of the celebrity's value, (ii) the average of responses about the celebrity clearly gives the consensus of the cultural group which is honoured as the authentic celebrity's value, and (iii) multiplying the respondent's objective fraction of the celebrity's value by the actual celebrity's value to give a more objective value for the respondent are all primary level calculations. As such, these two self-norming processes are computationally transparent.

subjective expectations. In the traditional questionnaires, these responses, each with their influences from unknown subjective expectations, are treated separately (e.g., by comparing each of them with the responses of other subjects to the same question). This makes little sense as the responses from different subjects are influenced by different unknown subjective expectations – as though they were assessed using different units. For example, if a hungry man and a sated man were both asked to rate the quality of the same sandwich - cut in half and given to both of them as a control - it might be expected that the hungry man would give a higher rating than the sated man because his need for food is greater. However, traditional questionnaires compare and average such differently valued responses as though they were based on the same subjective expectations. This traditional averaging of responses is based on true-score theory which wrongly assumes that different personal responses to each question are errors from the mean question response, i.e. treats their cultural interpretation of the differences between questions as errors – basically privileging the researcher's etic belief that the questions are all samples of the same construct. Traditionally these combined scores are the then Normed (compared) with similar combined scores from a supposedly similar population. However, Culturometrics has several methods of self-Norming responses to mediate the unknown subjective expectations before comparing or averaging results. This self-norming goes some way towards removing the errors of combining scores based on different unknown subjective expectations.

Hence, unlike traditional research methods that focus on the properties of measurement instruments (R-methods), Culturometric research methods always retain information on an individual's values in context (Q-methods) Utilisations of Q-method/R-method distinctions are now briefly described as they relate to the continuing development of the Culturometrics family of research methods.

> The difference between R and Q methods (Stephenson, 1935, 1953, 1985) also be described as a distinction between the methods of expression and impression. According to Bruce McKeown and Dan Thomas, methods of expression measure the traits from an external point of view in that "the respondent's own point of view on the matter is of little theoretical interest and technical significance" (McKeown & Thomas, 1988, p. 23). In other words, the investigator holds interest neither in what kind of meanings respondents assign to questions, nor in the intentions of respondents when they answer the questions. With methods of impression under the Q method, on the other hand, the respondents' subjective views gain prime importance. When assigning scores to the items, the internal frame of reference of each subject is embedded in their responses. By emphasising the importance of subjectivity, Q methodology proceeds in a naturalistic way in the sense that the research is "less contaminated by the scientist's intrusions." (Brown, 1993, p. 14; Kanra, 2013, pp. 55-58)

From radical constructivist to a social constructivist definition of cultural identity

We can see from practical examples in the Culturometric literature how this plays out in the design and development of particular research enquiries, for example, how we can understand the cultural identity of groups as a negotiated consensus of group members' individual cultural identities (Boufoy-Bastick, 2009, pp. 369–371). Thus, group change is effected through commensurate changes in cultural identities of individual members. From this postmodernist perspective of Culturometrics, group cultural identity is a social constructivist construct and individual Cultural Identity (CId) is a radical constructivist

construct. More explicitly, CId is "an aggregate of individual and group identity development, construction and negotiation shaped by complex inter-related sociocultural influences" (Boufoy-Bastick, 2007, p. 1). We might note in passing that the positivist/constructivist schism is but an unsubstantiated denial that positivism is just another socially constructed construct. Thus, in Culturometrics we define and measure cultural identity relative to self-expectation (self-Norming) and ground this in the values of the cultural group or selected cultural sub-group. However, to measure changes in group membership and group exclusion, for example to compare in-group and out-group perspectives, we can choose to ground identity in the values of the member group or in the values of another group. A joint significance for the shared aims of Culturometrics of this applied philosophy is the resulting cultural empowerment of our research subjects in defining and authenticating their own identities, that is, participants own the truth of who they are.

Culturometric group typology and construct reframing

Culturometrics has extended the remit of traditional Cultural Studies by (i) categorising cultural groups by the fluidity of their membership and (ii) reframing social constructs as cultural identities.

Culturometrics' typology of freedom and the dynamics of cultural change

In consonance with its humanistic foundations, Culturometrics is defined by concern for individual freedom to change and modify cultural identity and, if so chosen, the freedom to maintain the stability of one's chosen identity. In particular, Culturometrics' concern for the dynamics of cultural identity determines its own typology of cultural groups. This novel typology for group classification also extends Cultural Studies beyond its traditional group categorisations and issues of conflict and power relations. Culturometrics classifies cultural groups according to the freedom group members have to change or maintain their group cultural identity, that is according to the rigidity or flexibility with which group membership is determined - how open to change are their criteria for group membership - along the continuum from the most immutably fixed to the most flexibly self-determined.
Three generic Culturometric categories of groups are:

1. Genetically determined groups, e.g. ethnicity, race, sex and age groups, groups with congenital and developmental illnesses. It is very difficult indeed for these group members to change their group CId due to structural determination of membership.
2. Socially determined groups, e.g. unmarried mothers, the poor/wealthy, employment groups (e.g, students, teachers, nurses). It is less difficult for these group members to change their group CId due to socio-cultural pliability of group determination.
3. Self-selected groups, e.g. gangs, clubs, loyalty groups (e.g. brand customers, fans). Although often challenging, it is the least difficult for these group members to change their group CId because group determinations can be unlearnt.

The central agenda of Culturometrics is facilitating self-determined change and stability in cultural identity. Its outcomes of measuring cultural identity – profile differences and changes in primary identity components - can validate that specific factors constrain or drive

the dynamics of cultural change. If our research is to make this difference, then we best target change agents of enculturation and *bricolage*. In particular, whereas enculturation drives the ontogeny of individual cultural identity (Geertz & Jensen, 2011) from a socio-anthropological perspective it is *bricolage* that best describes the most usual processes of contact-driven CId change for individuals in pluri-cultural societies. In multi-ethnic diasporic societies cultural identity is changed by inter-ethnic mixing and cultural borrowing of selected behaviours and their associated values which make the traditional nominal categories of ethnicity unreliable indicators of cultural identity and predictors of preferred behaviours (Boufoy-Bastick, 2002a, 2002b).

Artistic and therapeutic practice-based research of any significance functions like education and like experimental treatment to engage participants as *bricoleurs* in a research experience that attempts to change who they are, their temporary and perhaps permanent cultural identities as for example, in chapters 7 to 11 of Timothy Reiss' (2002) book, *Against Autonomy: Global Dialectics of Cultural Exchange*, or more simply:

> The practice of popular theater is, in effect, a practice of bricolage. Participants literally sculpt their vision of existing realities and possible alternatives. Drawing from the collective wisdom of the group, they reframe problems and possibilities and create new meanings from the resources at hand. (Finn, Jacobson, & Campana, 2004, p. 339)

Linguistic reframing of "construct" as "identity"

Culturometrics also extends the remit of cultural studies by reframing social constructs as cultural identities. Thus, the methods of cultural studies used for researching cultural identity can through Culturometric reframing also be utilised for the study of social constructs – as follows.

Questionnaires that elicit subjective responses are ubiquitous. In order to elicit subjective responses, the administration of these instruments must obtain access to the values that participants associate with constructs represented by the questions. Culturometrics makes such access easier by reconceptualising research constructs as cultural identities of individuals and groups. It is then most natural to interrogate the participant in their role of the cultural identity corresponding to the construct in order to access and retrieve the values they associate with the construct. This is achieved by reversing the linguistic trend towards nominalising processes described by Halliday as *"thinginess"* (Halliday, 1992, 1994, 1998).

When processes are nominalised, we delete relational information so that we then think of the processes as objects that are more within our control and that can be objectively measured. For example, Education is a complex individual process of change in behaviour, cognition and resulting relationships. When it is nominalised, we think of it as an object that is more within our possibilities of control and objective measurement (e.g., "He couldn't afford to get a Harvard education so he got his education from MSU"). In this fashionable parlance the meanings of Education have been circumscribed to that of an object; an object whose value is objectively determined by its price and which might be bought at a particular locality - or even on-line. Culturometrics reverses this linguistic trend by perceiving the usually nominalised researched construct as a "role" expressed as a person's "cultural identity." Thus, "Education in a person" is reconceptualised as an "identity/role of an educated person;" a role that we know by observing behaviours which we interpret as demonstrations of that person's educated values. Depending on the subject context the cultural identity of the educated person might be to some extent a linguist, historian, a geographer, a sociologist or a mathematician, etc. So, each of the multifarious constructs to

be researched is construed through the CM lens as a cultural identity. This reframing opens different perceptions of the construct and options for researching it. For the example of Education, we can reconsider the construct of debilitating performance under exam stress in terms of inhibiting the expression of one's identity. Then, the Yerkes/Dobson "law" would relevantly lead us to expect that under examination threat/anxiety a candidate would be less able to express the more nuanced values of their identity (Chaskalson, 2011; Hanoch & Vitouch, 2004).

Older constructs already have their corresponding cultural identities. People who do carpentry are carpenters. People with criminal behaviours are criminals. People who teach are teachers. Unmarried women with children have the cultural identity of unmarried mothers. With newer research constructs, Culturometric reframing as a cultural identity is achieved in practice by using the behaviours indicative of the construct and phrasing them with "agentive suffixes" (e.g., adding *-ian, -ist -eer, -eur, -ot*). So a Culturometric pre-test and post-test of Anger Management treatments would assess the participant's abilities as an Anger Controller. Our participants might also have component identities to match their main methods of anger control. For example, those who restrained their expression of anger could be *Restrainers* and those who reduced their feelings of anger would be *Reducers*. Cultural identities can be observed through the interpretation of behavioural demonstrations of people's values in the contexts they define. People's behaviours, such as their stance, clothes, tone of voice, choice of words, etc., symbolise the values they are communicating in that context. They are demonstrating their current cultural identity. Hence, subjectivities of cultural identity can be objectively measured to the extent that these demonstrations of values can be objectively measured. Culturometrics allows such objective measurement by using self-norming methods to mediate the subjectivities involved.

Self-norming processes enabling objective comparisons of subjective self-evaluations of identity

Processes that maintain self-proportions are more revealing of function than are outcome measures relative to the mean. A physical illustration paralleling *Weltanschauung* worldview examples that give meaning to cultural identities (Bertens, 1993; Mannheim, 1952; Bloom, 2007; Servaes, 1988), would be that "your arm is long or short relative to the mean length of arms" holds less information about you as an individual than does "the relative length of your arms to that of the rest of your body." This "self-norming" emphasis of Culturometrics is inextricably embedded with man's deeply primeval anthropomorphism of nature and is a direct rational inheritance from the work of Wilhelm Dilthey (Rickman, 1979) as utilised by Max Weber in his dual aspect *Verstehen* (i.e., in terms of the relations of the part and the whole; Ritzer & Goodman, 2004). This "*Verstehen*" leitmotiv of Culturometrics is well epitomised in symbolic representation by Da Vinci's Vitruvian man (Culturometric website: www.Culturometrics.org).

Along with its qualitative methods based on communication of cultural identities, such as *Committed Communication*, Culturometrics has also developed several computationally transparent statistical methods that enable self-norming of subjective ratings so that they can be objectively compared and grounded relative to the values of a cultural group or of selected cultural sub-groups, and so maintain individual cultural identity as the

unit of analysis. Four such methods are: Value-added proportions (VAPs)[2], Null means[3], Q-correlation[4] and the Cultural Index[5].

One use of the Cultural Index is to measure and reveal the secrets of Cultural Identities. This is one Culturometric contribution towards fulfilling Max Weber's original anti-positivist agenda of *Verstehen*. Essentially, for a cultural group identity of interest, we measure the strengths of the subjects' contributing cultural identities relative to the chosen cultural group identity so that we can order participants from the weakest to the strongest. Using self-norming, allows us to do this without knowing the meaning individuals attach to their cultural identity. However, this ordering of participants on the strengths of their cultural identities does enable us to select a group of participants who have high strength of Cultural Identity, and a different group of participants who have low strength of Cultural Identity. We can then interview both groups to elicit their VABI and by contrasting their VABIs, we can objectively define the meanings of the chosen group's cultural identity. This contrasting process is described as "contrast interviewing." This can be preceded by Culturometric etic/emic Social Network Sampling, a method that will optimise effectiveness by ensuring we have a representative sample of the group's cultural identity composed mainly of participants who will populate the two extreme high and low groups.

We, then, describe our simple "Venn diagram" type of contrast interviewing so that, in the current anthropological sense of *Verstehen,* outside observers, such as researchers in other disciplines, can more readily relate to, and understand the emic meanings of the group's cultural identity and how individual group members position their Cultural Identities in the relation to the values of their cultural group.

Culturometric Two-Phase Etic/Emic Social Network Sampling

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[2] Value-added proportions measure personal changes on multi-dimensional constructs which can be aggregated into group differences that are more sensitive than current R-comparisons of groups based on anonymous differences and proportions of group means and variances such as ANOVAs.

[3] Null means enable personally meaningful outcome comparisons of a stimulus situation with those of a normal situation. By relating responses to an individual's own expectations it serves to replace group comparisons that use inappropriate and non-representative Norm groups. A widely applicable Culturometric technique within this method is the 'Respondent stress effect' which measures stress on each individual that can accompany changes in his or her cultural identity.

[4] Q-correlation is a simple self-norming process that assesses the reliability of each respondent's replies. This method preserves each respondent's individual interpretation of each question and measures the consistency with which he or she endorses that interpretation. In contrast, R-reliability methods confound interpretation and endorsement by imposing the researcher's etic interpretation of each question and treating the different cultural interpretations of the respondent's lack of reliability.

[5] The Cultural Index is a measure of Cultural Identity that can be used to objectively compare people on the strength of their cultural identities. It self-norms the subjectivity of values in the consensus of their cultural group or in the consensus of a selected cultural sub-group. Hence, using the Cultural Index offers options which include (a) measuring changes in cultural identities, e.g. changes that might be associated with treatments of hypothetical causes, (b) comparing in-group and out-group identities, to research possible rejection, acceptance or leadership, and (c) or as in the following section on 'Culturometric Two-Phase Etic/Emic Social Network Sampling', for a selected group cultural identity of interest, contrasting the values of respondents who have strong cultural identities with those who have weak cultural identities to reveal the meanings of the cultural identity for the selected group.

Culturometrics recognises that the cultural identity of groups evolves primarily from *"Committed Communication;"* a negotiated consensus of group members' individual cultural identities (Boufoy-Bastick, 2012a, pp. xxi-xxii). It is because cultural groups are primary constructions of traditional face-to-face social networks that face-to-face social networking – as opposed to on-line virtual social-networking – should be strongly indicated for constructing bespoke samples of cultural groups.

Culturometric Social Network Sampling is one of the new tools used in measuring and revealing the subjectivities of cultural identities. It serves to construct a sample of a selected group's cultural identity that can be used in conjunction with another new tool, contrast interviewing, to optimally reveal the meanings of the group's cultural identity. That is, we can optimally reduce the number of relatively resource intensive interviews by choosing to interview a sample comprised of participants who are extremely different in terms of the strength of the construct we are researching, the group's cultural identity, but who are matched in other respects relevant to the representativeness of the sample. That is, we can ensure valid data saturation by including the full sub-group variation of matched participants for interviewing – including all representative clusters for cluster sampling. Hence, our sample is designed to be representative of the group's cultural identity in both the variation of matched participants' cultural identities and in the range of strengths of group members' cultural identities. We first briefly evidence the Culturometric assumption introduced above that, because cultural groups are primary constructions of traditional face-to-face social networks, they are then strongly indicated as a method for constructing bespoke samples of cultural groups.

Justifications for using Social networking to sample of group cultural identity

Culturometrics uses directed social network sampling in phase two of its two-phase etic/emic sampling unit – explained in the next section. The Culturometric use of social networks for sampling to optimise the emic selection of interviewees who have contrasting stronger/weaker cultural identities may be thought of as a systematic snowball sampling (Oka & Whiting, 2013, p. 148). We use it in Culturometrics because cultural identity is purposefully a social networking phenomenon – much more so than say depression, obesity, smoking or alcoholism which are essentially only emergent properties in social networks (Christakis & Fowler, 2007; 2008; 2011; Rosenquist, Fowler, & Christakis, 2010; Rosenquist, Murabito, Fowler & Christakis, 2010). However, these emergent properties of social networks are surprisingly strong. For example, Figure 1 illustrates data from the Framingham Heart Study of the social networks of 5,124 people with social connections involving up to 12,067 people over 32 years.

Figure 1 shows that if you have a friend who is obese (degree of separation 1) then your probability of also being obese is increased by 50%. If your friend has a friend who is obese (degree of separation 2) then your probability of being obese is increased by 25%. If your friend has a friend who has a friend who is obese (degree of separation 3 - someone you might not even know) your probability of being obese is increased by 10%. It is not until the social separation is at degree 4 – a friend, of a friend, of a friend of a friend – that the increased probability hardly affects you. As Figure 1 illustrates, these emergent effects in social networks are surprisingly large. Hence, for a purposeful phenomenon of social networks, such as Cultural Identity, the expected effect will be much higher than it is for emergent properties. Hence, friends, and friends of friends, of the initial contact can be expected to share considerable awareness of the values in context defining the contact's Cultural Identity (CId). Further, in its use by Culturometric the probability of nominating an

appropriate participant for the sample is greatly enhanced by directing the contact to select friends who are either very strong or are very weak on the construct being researched.
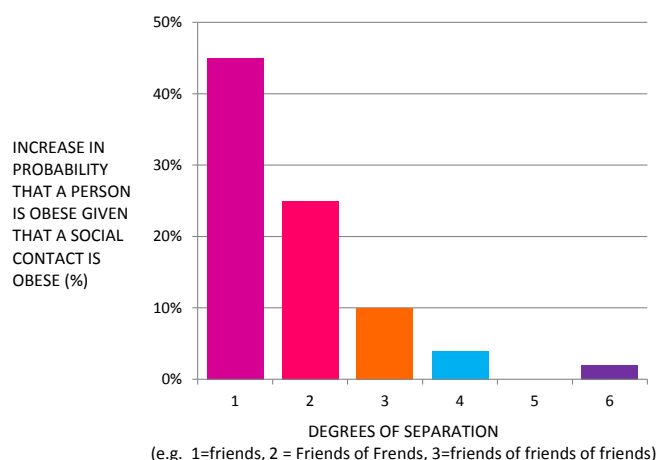

Figure 1: Degree of Social Network Separation and Body Size
Source: Adapted from *"Nicholas Christakis: The hidden influence of social networks"*
http://www.youtube.com/watch?v=2U-tOghblfE,04:02/18:44

However, although these emergent properties are large, even for distant friendship relationships, and the purposeful effects of CId are likely to be much greater than for emergent properties as illustrated in figure 1, the Culturometric use of directed social networks for nominating participants for our sample stops the selection processes at the nominations of friends of friends (degree 2) and so goes no further than degree of separation 2. This is because people commonly encourage introductions between their friends. This leads to friends of friends tending to nominate one another which would merely repeatedly re-nominate the participants already nominated for our sample.

Using Culturometric directed Social network sampling: Replicating the two-phase etic/emic sampling unit

Our sample is designed to be representative of the group's cultural identity in both the variation of matched participants' cultural identities and in the range of strengths of group members' cultural identities. For this, we use a two-phase etic/emic sampling unit, Figure 2, which we replicate until we have a variety of initial contacts that will insure data saturation in the subsequent interviewing process. Hence, the first phase ensures representation of the variation for valid data saturation, while the second phase builds the two extreme full-range strong/weak contrast groups for optimum contrast interviewing.

In the first phase, we select a variety of participants who have the etic construct marker. This is marker is an observation that has face validity in identifying probable members of the cultural group. For example, if we are researching Chinese cultural identity of market vendors we will probably sample the variety of market vendors who share stereotypical Chinese phenotypes (e.g., simply looking Chinese). We will use traditional cluster sampling on relevant clusters – perhaps clustering by age, gender, SES, region of ancestor origin, etc. These participants are our initial contacts and their representative variation is to ensure the eventual valid data saturation of our contrast interviewing. Note that data saturation can be reached with just one participant, but it might have little content validity as that one participant may not represent the variation of values in the whole group's

cultural identity. Hence, for exhaustive content validity one must sample the variety of cultural identities in the group. One limitation of the researcher only using his or her etic stereotypical construct marker for sample selection is that he or she might be way "off target." This is because, as mentioned above, *bricolage* best describes the most usual processes of contact-driven CId change for individuals in culturally diverse societies, particularly in societies that are pluri-cultural and multigenerational. So for example, the etic construct marker of "participant must look Chinese" could be frequently "off target" as market vendors that do not look Chinese could well be more culturally Chinese than those who do, and those market vendors who look Chinese might not retain those values that denote the cultural identity of Chinese market vendors. Thus, we cannot allow our selection of interviewees to be limited to those who only fit the etic stereotype expected by the researcher. Phase-two of the directed social network sampling resolves this problem.
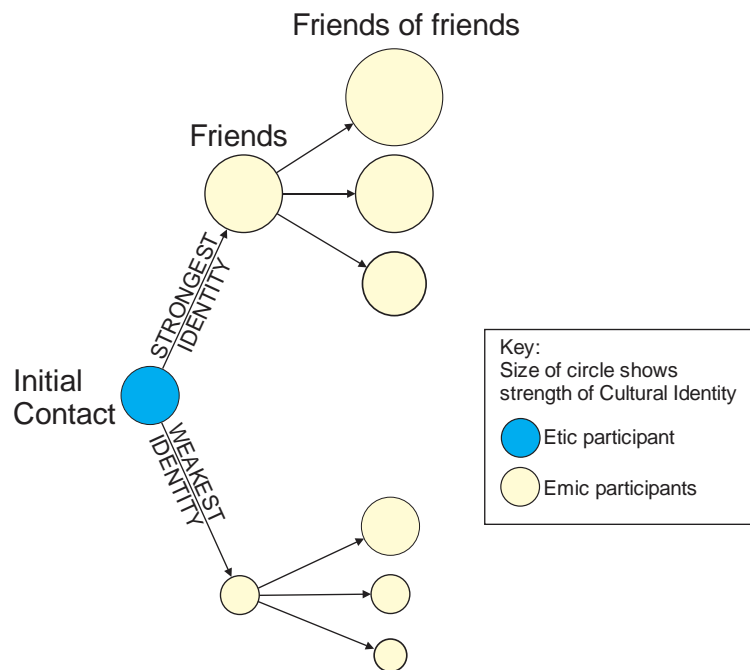

Figure 2: Two-phase etic/emic sampling unit: Phase 1 random sampling to ensure valid data saturation and Phase 2 social network sampling to ensure optimum contrast interviewing

In phase 1, the initial contacts are chosen at random. When we have chosen an initial contact we can move to phase 2 for emic selection. Phase 2 has two stages and in these stages the researcher's etic construct marker is not used for selection. In the first stage of phase 2, the initial contact is directed to nominate two Chinese friends, one who is the most Chinese and one who is the least Chinese. The initial contacts are directed to use their individual emic subjective criteria to make this judgement. It is of no consequence whether the contacts' subjective criteria do or do not include the stereotypical construct marker that was used by the researcher to select the initial contact. In this way we start to move from the researcher's stereotypical etic construct marker towards the authentic subjective emic construct markers of the cultural group. Phase 2 stage 1 results in two degree 1 friends of the contact being nominated as participants – one considered by the contact to have a strong Chinese cultural identity and the other considered by the contact to have a weak Chinese identity.

Phase 2 stage 2 moves us further from the researcher's preconceptions and closer to selection of participants who represent strong and weak cultural identities of the selected

group. In Phase 2 stage 2, we direct the Chinese friend of the initial contact who had the strongest Chinese cultural identity to nominate three of their Chinese friends who also have the strongest Chinese cultural identity. Similarly, we direct the Chinese friend of the initial contact who had the weakest Chinese cultural identity to nominate three of their Chinese friends who also have the weakest Chinese cultural identity. Each two-phase sampling unit thus delivers nine participants towards our bespoke sample, comprising the initial etic contact, two emic degree 1 friends and 6 more emic degree 2 friends. We repeat this two-phase sampling unit until we have a sufficient variety of initial contacts to ensure valid data saturation. Then we are ready to measure the strengths of each participant's cultural identity. We do this with the *"celebrity questionnaire."*

The "celebrity questionnaire": Measuring the strength of cultural identity

Culturometrics aims to develop simple measures of complex barely understood phenomena to help us try and understand a little more about their complexities. Although what is being measured is enormously complicated, as are the cognitive and affective judgements of our experiences on which our awareness of them depends, it is extremely easy to use Culturometrics to measure the strength of an individual's cultural identity. After showing this simple method, we will then explain how the philosophy of Culturometrics allows us to by-pass these unknown complexities. This is akin to how randomisation protects our data collection by allowing us to avoid the effects of unknown influences.

To objectively measure the strength of cultural identity, Culturometric uses an empowering[6] instrument called the "celebrity questionnaire" that encourages participants to consider themselves with celebrities who are known to have aspects of their cultural identities in common with those of the participants. This instrument uses questions whose responses allow the calculations that measure the strength of individual cultural identity and consensus group values. The measure of strength of Cultural Identity is the Cultural Index. The questionnaire can include data collection questions for other Culturometrics methods, such as questions for Q-corr, but fundamentally the "celebrity questionnaire" only needs two questions, Q1 and Q2.

We simply ask a participant Question 1 (Q1) to judge the strength of their own CId and, using the same values for comparison, we ask them Question 2 (Q2) to judge the CId strength of a public object or public figure, both as a percentage. From these two numbers we can simply calculate the strength of their cultural identity. This is called their Cultural Index (CI) (Boufoy-Bastick, 2000, 2007, 2010).

To illustrate, we can continue our example of measuring the Chinese cultural identity of Chinese market traders. For a public object, we can use any famous part-Chinese market trader known to the participants – for best psychometric discrimination the celebrity should look preferably about half Chinese in the photograph that is used. As the main purpose of this research is to describe the cultural identity of the group it is better to first ask Q2 about the celebrity and then to ask Q1 about themselves. The Q2 Q1 order is preferred because Q2 tends to limit the subjective exemplars of sub-contexts on which judgment is based and which are then likely to also be used for Q1. In addition, the Q1 Q2 order tends to set the participant's frame of reference to that of their cultural group for both questions, more so than

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[6] It invites an empowering identification with a celebrity who shares some of the respondents' cultural values. It also empowers by honouring their emic meaning of the construct and by not physically abusing their commitment to the study by requiring large numbers of questions to be answered and many questionnaires completed, in order to support the traditional statistical assumptions of classic true-score theory that their cultural values are random errors.

would Q1 which might encourage conversely a more idiosyncratic and less representative frame of reference.

Q1 is "How Chinese are you" and Q2 is, on the same scale "How Chinese is the public object."

We can ask these two questions as 0 to 100% ratings or use a Visual Analogue Scale (VAS) (Crichton, 2001, p. 706). Figure 3 shows a possible Celebrity questionnaire format. As our "Chinese market vendor" example is a fictitious example constructed for this disquisition we have no suitable celebrity photograph so substitute a photograph of supermodel, actor and television personality Tyson Beckford who is part Chinese and part Afro-Jamaican (Source http://en.wikipedia.org/wiki/Blasian cc).

The Chinese Celebrity Questionnaire

Instructions to respondent: "Think for a moment what it really means to be Chinese"

Q2 Draw an 'X' on the line to show how Chinese you think supermodel and actor Tyson Beckford really is

0%   100%
Chinese   O   X   Chinese

Q1 Now draw a 'O' on the same line to show how Chinese <u>you</u> really are.
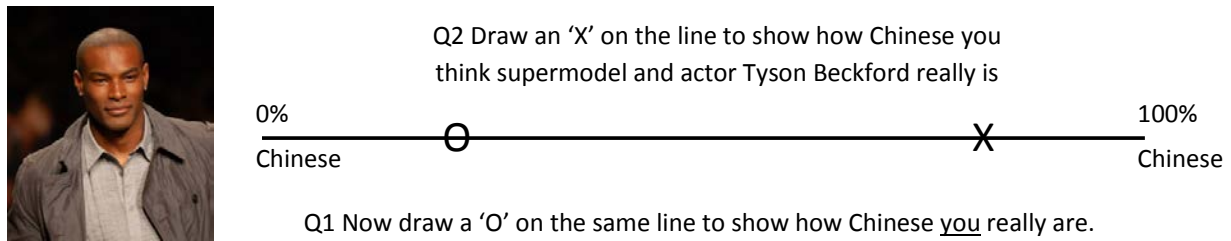
Figure 3: Visual Analogue Scale format of the Celebrity Questionnaire showing two comparable subjective ratings on the same percentage scale

Suppose this example shows the "O" answer for Q1 and the "X" answer for Q2 that was given by participant James Chow. To turn these two answers into numbers, we would have made the line 100mm long to represent the 100%. Then, putting a ruler on the line would show that the distance from the start of the line to the "O" is 20mm, so the respondents answer to Q1 is 20. Similarly, James Chow's answer to Q2 is 80. To summarise, Mr. Chow's answers are Q1=20, Q2=80. When we have given out all the questionnaires we will have everyone's answers to Q2 and we can find the average of these Q2 answers (mean of Q2s) which will tell us, on average, how Chinese this group of Chinese respondents think supermodel and actor Tyson Beckford really is. Let us say for simplicity that the mean of all the Q2 answers is 60, so we have these three numbers, Q1=20, Q2=80 from Mr. Chow and (mean of Q2s)=60 from the whole group. From these three numbers we find the strength of James Chow's Chinese identity. This is his Cultural Index of Chinese-ness (CIC). It is simply:

$$20/80 \text{ x } 60 = 15$$

Using this same simple calculation for each respondent, we can find the relative "true" Chinese-ness of each person, then sort the list of numbers into order so that we can select a few with the strongest Chinese identity from the top of the list and a few with the weakest Chinese identity from the bottom of the list for our contrast interviews.

Now we explain why this works. Looking at the above calculation, we can match-up the numbers with Q1, Q2 and the (mean of Q2s) to find the formula for doing this calculation. It is:

$$CIC= Q1/Q2 \text{ x (mean of Q2s)}$$

Q1/Q2 expresses how Chinese the participant is in relation to the Chinese-ness of the public object. The same questionnaires are administered to all participants in our bespoke sample and when all respondents' have answered, we can find the average of these Q2 answers (mean of Q2s). This (mean of Q2s) represents the consensus of the group - how Chinese this group thinks the public object really is. As the group are in the privileged position of knowing the emic meaning of the construct, this is the most authentic result. From these three numbers the strength of Chinese identity can be found for each individual using the above formula, that is the Cultural Index of Chinese-ness of each respondent grounded in the consensus "values in context" of a group of Chinese respondents. The public object enables us to regulate each participant's private subjective judgements by "norming" the participant to him or herself because he or she uses the same subjective bias that is his or her personal complex expectation of what it means to be Chinese to answer both Q1 and Q2. Therefore, when we divide Q1 by Q2 that subjective factor in both responses will cancel out – to the first degree. Q1/Q2 is now an objective proportion showing in our example above, that participant James Chow is 20/80= ¼ as Chinese as the celebrity, according to the person who knows best: that is participant James Chow. If we knew the true Chinese-ness of the celebrity then the true Chinese-ness of James Chow would be ¼ of that. However, we do have the most authentic measure of the celebrity's Chinese-ness in the consensus of the group. By using the average rating for the public object given by the Chinese group, we can now ground James Chow's Chinese-ness according to the values of the group. His or her Cultural Index, which is the strength of his or her cultural identity, is simply: Q1/Q2 x average of Q2s.

For more complex considerations we can use only the Q2 values for a selected cultural sub-group. For example, for an even more authentic cultural grounding we can totally exclude the researcher's stereotypical criteria by omitting the initial contacts from the calculation of the mean of Q2, using only the eight nominated friends. If we thought it desirable, we could base the mean of Q2 only on the six degree-2 friends of each sampling unit, as these are the most emic nominated participants. To illustrate the simplicity of even more complex cultural considerations we can measure a participant's Chinese Cultural Identity from the perspective of female Chinese market vendors, simply by only including females in the calculation of the mean of Q2. We can do the same from a male perspective and even use the difference as an indicator of Chinese gender identity – from male to androgynous to female - among this cultural group of Chinese market vendors. To describe the meaning of Chinese gender identity we would sort participants by the strength of their gender identity and select extremes for contrast interviewing.

Values, Attitudes, Beliefs and Intentions (VABI) of Cultural Identities
Contrast interviewing and data analysis for revealing VABI of Cultural Identities

Now that we have identified our two groups of interviewees, those with high Cultural Indices (CIs) and those with low CIs, we need to use our contrast interviews in order to elicit objective emic criteria that we can analyse to distinguish between these two groups. In particular, we need to ask the relevant questions for our analysis to find what objective criteria only apply to the high construct group and not to the low group, and to find what objective criteria only apply to the low construct group and not to the high group. For this, we use Contrast Interviewing.

How do we conduct Contrast Interviewing?

To conduct a contrast interview, we ask our interviewees how they let others know that they have the cultural identity of the construct. Their reports will produce many short descriptions – like twitters - on the interviewees' values in context and sub-contexts. Each verbatim transcript can be mass-coded by the interviewee's demographics and individually coded as examples of themed values in their contexts.

In the process of interviewing we need to ask the best questions to reduce the interviewees' values in context. In the example, we are interested in accessing interviewees' Values, Attitudes, Beliefs and Intentions (VABI) in different sub-contexts of being a Chinese market vendor. Hence, we need to know, not only the behaviours that communicate their cultural identity but what these behaviours signify in terms of their VABI – why they do what they do. R-questionnaires mistakenly use records of behaviour as indicators of construct strength. This is no longer tenable for pluri-cultural applications, This is because knowledge of behaviours alone is an insufficient indicator of values in that in pluri-cultural societies the same behaviours can have totally different meanings – signifying very different values – to different participants. Hence, we must know the values the interviewee intends to be communicated by their specific behaviours in each sub-context of the construct – what is their behavior meant to convey.

Cultural identity is "values in context," so when we interview our respondents we need to find objective criteria of their values in a given context. To describe Cultural Identity we need to identify the values in context (value themes) that are unique to the high construct interviewees and those that are unique to the low construct interviewees. We do this using Contrast Analysis.

Contrast analysis

Each sub-context of our high construct interviewees results in two types of value themes, those that only apply to high construct interviewees and those that apply to all construct interviewees. Unfortunately, we will only know which are which by comparing interviews from the two groups. We use contrast analysis to identify which are which. Similarly, our low construct interviewees will give us two types of value themes, those that only apply to low construct interviewees and those that apply to all construct interviewees. Again, we use contrast analysis to identify which are which. This is illustrated in Figure 4.

The contrast analysis is very simple. For each sub-context, we first find what values are in common between the High and Low groups, common = (High and Low). We, then, remove these common values, firstly, from the High values to give the uniquely High values, and then, from the Low values to give the uniquely Low values. As respondents with high CI have strong Cultural Identities the strong Cultural Identity on each sub-context is described by High values minus common (High and Low) values. Similarly, weak Cultural Identity on each sub-context is described by Low values minus common (High and Low) values. This process is now stated as three simple steps in a form suitable for use with Qualitative Data Analysis (QDA) programs.
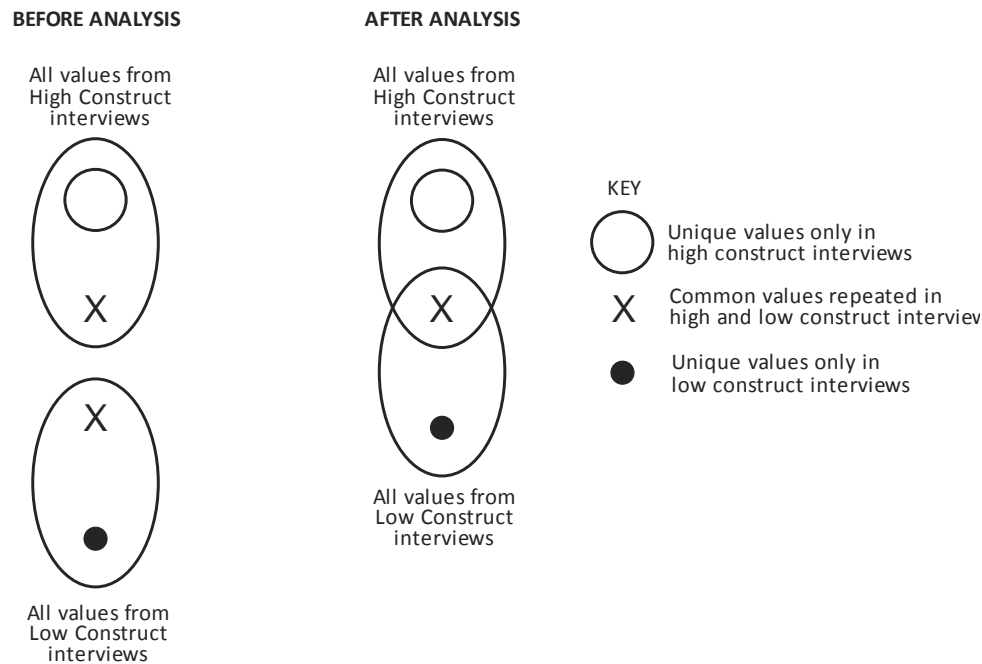
Figure 4: Contrast interview analysis identifying values in context that describe Cultural Identity

Three-step logic of contrast analysis

1) Identify the common values by finding the values that are repeated in the Low and High construct interviews (Low and High).
    Technically, this is known as the intersection L∩H.
2) Identify only High construct values by removing what is in common from all the values in the High construct interviews [High – (Low and High)].
    Technically, this is known as the relative complement of L with respect to H, i.e. everything outside L, that is also in H, (L^C∩H)=L/H.
3) Identify only Low construct values by removing what is in common from all the values in the Low construct interviews [Low – (Low and High)][7].

Reporting results of contrast analyses: Ideal types

The unique exemplars of the codes which have tagged what high and low construct interviewees do in the sub-contexts of the construct and why they do these things, can be used to report cultural identities as Grounded Composite Narratives - grounded in the evidence of these exemplars. For example, we can construct fictional characters that combine the traits comprised by the results of the analysis. These Modal Types, and/or Polar Types, make it easy and interesting for the readers to understand typical Cultural Identities and differences between Cultural Identities which result from the research (Boufoy-Bastick, 2003a; 2003b). Finally, it is to be noted that the values driving the communications of high strength construct interviewees and low strength interviewees in the variety of sub-contexts that define the lives of Chinese market vendors then describe the full range of the construct.

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[7] This is known as the relative complement of H with respect to L, i.e. everything outside H that is also in L, (L∩H^C)=H/L. These Boolean text operators are available for qualitative analysis in most QDA programs that you are likely to use for coding and analysis of your interview data. (http://en.wikipedia.org/wiki/Relative_complement#Relative_complement)

They are also the "Gold Standard" for criterion validation of the Cultural Index (CI) measure used to define the two groups.

Conclusion

Culturometrics is an empowering humanistic philosophy whose intentions largely coincide with Max Weber's original anti-positivist agenda of *Verstehen* and Abraham Maslow's subsequent programme for Self-Actualization. For example, its methods recognise that research subjects own the truth about who they are, and about how they define and authenticate their own identities. Culturometrics contributes to fulfilling the *Verstehen* agenda with innovative research methods that bridge the growing philosophical and empirical divide between practitioners and researchers. These methods systematically mediate the rich inter-subjective experiences of our research participants. By using self-norming methods appropriate to our research constructs and research questions for retaining Cultural Identity as the unit of analysis, operationally defined as "values in context," we can then objectively relate individuals' cultural identities to those of various cultural groups and sub-groups.

Using Culturometrics we can explore ideologies in relation to power structures that result in inclusion/exclusion of specific groups and in changes of group membership. We do this by understanding how people construct their individual and social identities around these ideologies. Culturometrics also facilitates our exploration of more nuanced constructs and inclusions/exclusions by reframing them as individual and group cultural identities whose strengths we can measure as objective cultural indices. Using these cultural indices, we can identify individuals who have constructed strong or weak identities around these constructs and then interview them. These interviews seek to elicit how interviewees see themselves, who they are, where they stand, and what they do with reference to our research construct and serve to note objective, observable criteria symbolising their "values in context" that enable us to confirm their emic identities. Thus, Culturometrics expands the remit of subject areas such as Cultural Studies by categorising groups according to the fluidity of their membership and objectively re-framing social constructs as cultural identities. Two illustrative research applications for two contrasting research purposes, marketing and psychiatry, serve to illustrate the extended range of applications for cultural studies: in (i) brand marketing, where customers' cultural identity is a reframing of "brand loyalty" to a selected commercial product and (ii) psychiatry where patients' cultural group identity is a reframing of a "medical disorder." In order to measure and reveal the inter-subjectivities of Cultural Identity, Culturometrics uses a systematic two-phase etic/emic sampling method illustrative of its intention of developing methods for bridging the Practitioner-Researcher divide. Phase one ensures construct representation and phase two uses emic directed social network sampling. The strengths of participants' Cultural Identities are objectively measured in relation to the consensus of their cultural group to objectively identify the two groups. The two groups are then systematically compared on their values in relation to an exhaustive set of sub-contexts that represent the context of the group identity or social construct being researched.

The compound two-phase systematic sampling used is an innovative Culturometric compound data collection method. Phase 1 uses traditional random sampling representing the population to ensure valid data saturation, and phase 2 uses directed social network sampling of the construct range to ensure high contrast interviewing. This ensures that participants are emically nominated and sampling is not limited by the researcher's initial etic assumptions. In concluding, a major contribution Culturometrics brings to the appreciation and enhancement of socio-cultural diversity is an ever-growing family of empowering and objective methods and techniques facilitating cultural research. The common key to this

growing family of methods is that, rather than being based on Classical Response Theory and instrument Psychometrics to standardise a person to some foreign Norm, each person is compared to his or her own personal standards which are then grounded in the consensus values of their cultural group. Culturometrics continues to develop humanistic qualitative and quantitative methods and techniques based on individual cultural identity, the demonstration of *values in context*.

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