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Project Magellan: Collecting Cross-cultural Affective Meanings Via The Internet



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Scientific assessment of subjective culture became a practical matter in the final quarter of the twentieth century. Psychologists Osgood, May, and Miron (1975) derived three dimensions of affective meaning from multivariate analyses of adjective rating scales, and they showed that these factors of affective meaning exist in more than 20 cultures around the world. Sociologist Heise (1979; 1985) mathematically modeled the human cybernetic system that operates on affective meanings, and he and others demonstrated how the mind uses the system in the construction of a variety of cultural forms such as roles, emotions, attributions, and labeling (Smith-Lovin and Heise, 1987; MacKinnon, 1994). Anthropologists Romney, Weller, and Batchelder (1986) mathematically analyzed informants' knowledge about a homogeneous culture and showed that the respondent sampling requirements for a reliable assessment of culture are far less than the sample sizes required to survey individual characteristics in a diverse population. In combination, these developments provide the foundation for a new social science technology that permits significant portions of cultural knowledge to be measured, stored, and retrieved with computers, that opens new approaches to understanding social relations, and that permits rigorous cross-cultural studies.

Project Magellan, described in this report, manifests the new technology. In the 1980s and 1990s sociologists Neil MacKinnon, Andreas Schneider, and Herman Smith obtained large dictionaries of affective meanings cross-culturally for use in computer simulations of social interaction (Schneider and Heise, 1995). Their work has nucleated into the Magellan project of international data collection and distribution via the Internet.

This description of the new enterprise begins by focusing on a new computer program named *Surveyor*, which can be employed around the world via the Internet. *Surveyor* gathers data on affective meanings using adjective rating scales in indigenous languages. Next the mechanics of a Magellan project in a particular culture are indicated by outlining a study currently being conducted in the U.S.A. Finally, some of potentials of the enterprise are portrayed through cross-cultural analyses of data already collected. The findings anticipate results that will ensue from Magellan because the available data were obtained with instruments similar to but less powerful than *Surveyor*.

Measuring Affective Meaning

Affective meanings can be measured with bipolar scales defined with contrasting adjectives at each end (Osgood, May, and Miron, 1975). For example, a scale might contrast “good, nice” with “bad, awful” and provide nine reference positions in between, as shown in Figure 1. A stimulus like “helping someone” is presented above the scale. The respondent positions a pointer on the scale in order to represent her sentiment about helping someone.

Figure 1: Evaluation Rating Scale For English Speakers .



The middle position on the scale is labeled “neutral” and reference positions going outward are labeled with adverbs “slightly,” “quite,” “extremely,” “infinitely.” Figure 1 reveals how each reference position is coded numerically on the basis of scaling analyses (Heise, 1978). However, the coding numbers typically are not shown to respondents who are using the scale to make ratings.

A number of generalizations are supported by hundreds of research studies on the use of bipolar adjective rating scales for measuring affective meanings (Snider and Osgood, 1969).

- The scales are a simple, economical means for obtaining data on people’s reactions to stimuli. Such scales can be administered to adults from any culture, and even children (DiVesta, 1966).
- Three dimensions of response - Evaluation, Potency, and Activity (EPA) - account for most of the co-variation in ratings on bipolar adjective rating scales. The Evaluation dimension is tapped by the “good, nice” versus “bad, awful” scale just mentioned. The Potency dimension corresponds to a scale that contrasts “powerful, big” with “powerless, little.” A scale for assessing the Activity dimension contrasts “fast, noisy, active” with “slow, quiet, inactive.” Pan-cultural multivariate analyses have demonstrated that these EPA dimensions are clearly recognizable in multiple cultures and a variety of languages.
- EPA measurements are appropriate when one is interested in affective meanings rather than denotative or logical meanings. Affective meanings correspond to sentiments - that is, the general feelings that we have about something. The EPA system is notable for being a multivariate approach to affective meanings, as compared, say, to attitude measurement which deals only with the single dimension of Evaluation.

Evaluation is involved in more semantic contrasts than Potency, and Potency is more ubiquitous than Activity. However, all three dimensions are equally important in social studies. For example, Evaluations correspond to attitudes and values, the Potency dimension indexes the power of roles and the impact of actions, and the Activity dimension assesses individuals’ propensity to action and levels of emotional activation.

Internet Data Collection

In the 1970s, thousands of sentiments about social identities and social behaviors were measured in the United States and in Ireland (e.g. see Smith-Lovin and Heise, 1988). Opportunities for cross-cultural analyses grew with Neil MacKinnon’s acquisition of data on sentiments in Canada (e.g., see MacKinnon and Langford, 1994), with Andreas Schneider’s survey of sentiments in Germany (e.g., see Schneider, 1996), and with Herman Smith’s sentiment measurements in Japan (e.g., see Smith, Matsuno, and Umino, 1994) and currently in China.

The early studies in the U.S.A., Ireland, and Canada were done with printed questionnaires employing mark-sense technology. Typesetting and printing the questionnaires was expensive, and muscular researchers were required to lug boxes of questionnaires from offices to respondents to mark-sense machines. The mark-sense technology was contemporaneous with the infamous card-punch system of Florida elections and equally reliable, so tedious and costly data cleaning was a necessity.

In the 1980s a program called *Attitude* was developed for computer-based data collection (Heise, 1982). The computer methodology eliminated printed questionnaires and the unreliable process of transforming pencil marks to electronic digits. Bipolar rating scales

presented on computer screens offered far more rating positions than the old printed questionnaires, and computer-based randomization eliminated various kinds of measurement biases. *Attitude*, translated to German, Japanese, and Chinese, was used to collect all of the available foreign-language dictionaries of affective meanings, and it currently is being used to update dictionaries in Canada.

Recently, the *Attitude* program was reconstructed as a Java applet named *Surveyor* in order to collect EPA ratings via the World Wide Web. Respondents with a computer connection to the Internet go to a WWW page that fetches the Java applet and its associated stimuli files. The applet presents stimuli, and the respondent rates the stimuli with the computer's mouse, by dragging a pointer along bipolar adjective scales. The applet records the respondent's ratings in numerical form and sends the data to a central computer for storage when the respondent finishes the ratings.

The *Surveyor* measuring instrument can be revised to work in any indigenous language. For example, Figure 1 shows a *Surveyor* evaluation rating scale in English, and Figure 2 shows the equivalent evaluation rating scale in *Surveyor*'s Japanese rendition. Currently, renditions also are available in German, Spanish, and simplified Chinese.

Figure 2: Evaluation Rating Scale For Japanese Speakers.



Surveyor collects precise numerical data on affective meanings at remote sites, even on different continents, without a senior ACT researcher necessarily being present. Indigenous assistants can be employed to recruit respondents and arrange computer access. At the end of a session, a WWW page provided by the researcher is displayed to the respondent, and this page may include an email form that the respondent fills out to verify participation in the project in order to receive some form of remuneration. At the end of each session the respondent's data are transmitted electronically via the Internet to the U.S.A. In the U.S.A. the data automatically are assembled into cleanly coded data sets. Authorized researchers, including researchers in the country of the data's origin, can download the data from the U.S.A. at any time via the Internet.

A *Surveyor* session begins with multiple-choice questions. Any number of multiple-choice questions may be included, and each question may have as many as nine options. *Surveyor* includes a tutorial, with practice in the use of graphic rating scales. The researcher who is managing the project determines whether or not the tutorial is part of respondents' sessions. After multiple-choice questions have been presented, and the respondent has completed the tutorial if it is being used, the session continues with ratings of stimuli on graphic rating scales. Any number of stimuli may be included. A stimulus may be any text in the indigenous language that appears on a single line or on two lines - words, phrases, sentences. Three different ratings are obtained for each stimulus, Evaluation, Potency, and Activity. Questions and stimuli may be divided into subsets that are presented to different respondents. Thereby data can be collected on more items than any one respondent could manage.

Surveyor extends measurement advances introduced in the *Attitude* program. Ratings are recorded as decimal numbers with 430 increments from one end of the scale to the other, rather than the seven increments of early semantic differential scales, or the 80 increments of the *Attitude* program. Randomization is used at the following critical points: (1) selection of a stimulus subset for a respondent; (2) order of presentation for stimuli within a stimulus subset; (3) order of presentation of EPA scales; (4) orientation of each graphic rating scale. In other words, a respondent will be assigned a randomly-chosen subset of items; the order in which stimuli from that subset are presented will be randomized; the order of presenting EPA scales for each stimulus will be randomized; and every presentation of a rating scale will have its positive end randomly assigned to the left or the right.

Respondents using *Surveyor* are allowed to skip a stimulus that is unfamiliar to them. The skipping procedure requires clicking a button, confirming intent in a pop-up dialog, and waiting a few seconds. Respondents also are allowed to re-rate any stimulus. The procedure is to click a button and make a selection from a list of all completed stimuli. Data on the selected stimulus are erased, and the selected stimulus becomes the next stimulus to be rated on all three EPA scales. The opportunity to re-rate stimuli is offered automatically at the end of a session.

Surveyor produces a separate data file for each stimulus set, with data records from respondents appended one after another, separated by two blank lines. A respondent's record has multiple lines, and each line consists of multiple items separated by commas. Line one begins with a time-based nine-digit subject number, followed by identification of the server that the respondent used, if such a name is available. A study name and the number of the stimulus set are recorded next, where the name identifies the location and time of data gathering - e.g., UIowaApr01_1. The final two items on line one are the number of stimuli that the respondent skipped, and the total number of minutes that the respondent devoted to the tasks. The second line of a respondent's record reports the respondent's answer to the first background question, both as a verbalization and as a code number. Subsequent lines report answers to additional background questions in the same format, until all of the background data is recorded. Lines of rating data follow, each line consisting of a verbalization of the first stimulus, the respondent's evaluation rating, then the respondent's potency rating, then the respondent's activity rating. Ratings are recorded as decimal numbers ranging from -4.30 to 4.30. Skipped stimuli are recorded with the missing-data value of -99.0. Randomization is removed in the data record; that is, stimuli are listed in a pre-set order, ratings always are in the order evaluation-potency-activity; and positive numbers represent good or powerful or active ratings regardless of whether a rating scale was presented with its positive end on the left or the right.

Surveyor data files contain not only data but also essential verbal information allowing the data to be interpreted without a codebook. Thus archived *Surveyor* files may be analyzed years later, even by researchers who were not involved in the original study. Perpetual availability of archived data was the rationale for including stimuli as well as answers in *Surveyor* data files, even though this verbal material makes the files somewhat bulky.

Setting up a Magellan project using *Surveyor* involves selecting background questions and stimuli and organizing these into files with a certain format. If working in a language that is not written with Latin characters, the background questions and stimuli must be translated to Unicode. Completed stimuli files, and HTML files for WWW pages associated with the project, must be conveyed to David Heise (heise@indiana.edu) for Java compilation and posting on the Internet2. If working with an indigenous language that has not been used previously in Project Magellan, texts in *Surveyor*'s interface also must be translated into a Unicode rendition of the indigenous language and conveyed to Heise for Java compilation, posting on the web, and pilot testing.

The processes of selecting and organizing background questions and stimuli are discussed in the next section. Technical details regarding the format of files and translation to Unicode are discussed on the web at <http://www.indiana.edu/~socpsy/ACT/SurveyorDocumentation.htm> - a site that is updated occasionally for the sake of clarity or to reflect new developments in Project Magellan.

The U.S.A. Study

Surveyor currently is being used in the U.S.A. to measure affective-meanings related to social relations, updating measurements that were last made in the 1970s. The U.S.A. study is described here as an example of a Magellan study.

Stimuli

Concepts rated in this study were chosen above all to be relevant to computer simulations of social interaction. Useful concepts for this purpose are social *identities* naming different kinds of individuals, social *settings* naming places or times where social interactions can take place, social *behaviors* naming actions that one individual can perform on another individual, and personal *modifiers* naming emotions, traits, and statuses that might characterize individuals during social interaction. The measurement technology presumes homogeneity of meaning across raters, so emphasis was on institutionalized, familiar, colloquial concepts, rather than on emerging or controversial concepts.

Additionally, concepts were chosen for their continuity with concepts used in prior studies, in order to provide opportunities for comparison with measurements made in the earlier U.S.A. study and with measurements that have been made in other cultures. An initial list of concepts was built from the nearly 4,000 concepts rated in prior studies of affective meanings.

Additional identities, behaviors, and settings were obtained by searching the *WordNet* electronic lexical database (Fellbaum, 1999). *WordNet* is an on-line (www.cogsci.princeton.edu/~wn/) lexical reference system inspired by psycholinguistic theories of lexical memory. *WordNet* organizes English nouns, verbs, adjectives and adverbs into synonym sets, each representing one underlying lexical concept, with logical relations linking the synonym sets. In the case of identities, *WordNet* named approximately 10,000 specific instances of “person, individual, someone, somebody, mortal, human, soul.” *WordNet* named about 2,700 settings representing specific instances of “structure, construction,” “group action,” or “time period, period, period of time, amount of time.” *WordNet* named about 1,700 behaviors fitting 29 verb frames implying human agency, such as: They ___ the people the food; Sam is ___ing Sue; Sam and Sue ___.

A different source was used to assemble possible modifiers: the Clore, Ortony, and Foss (1987) list of about 500 affect-related adjectives for describing individuals.

Over 15,000 concepts were examined in the process of selecting a final set of 1,500 concepts. The final 500 identities, 200 settings, 500 behaviors, and 300 modifiers are listed in Appendices 1-4.

Identities and settings were selected to delineate various kinds of social relationship, with some kinds of relationship being emphasized more than others, as indicated in Table 1. The variations in emphasis are intended to reflect the frequency of different kinds of social interactions on one hand, and to facilitate future studies of certain social institutions on the other hand. A large number of informal and mildly deviant identities (e.g., friend, drunk, old timer) were selected, these being identities that often arise in social interactions. Substantial numbers of identities also were selected in the categories of family (e.g., wife, daughter, adulterer), law and deviance (e.g., cop, judge, rapist), and commerce (e.g., businessman, customer, shoplifter) because these social institutions are foci of affect control theory research at present. Moderate numbers of identities were selected in the areas of politics and military (e.g., citizen, Marine Corps officer, politician), academia (e.g., coed, dropout, student), medicine (e.g., convalescent, doctor, sawbones), and religion (e.g., devil worshiper, evangelist, God).

Differential selection of settings gave most emphasis to informal settings (e.g., beach, mealtime, washroom) and commerce settings (e.g., business meeting, office, supermarket). A few specialized settings in each of the other social institutions also were included (e.g., family reunion, courtroom, battlefield, classroom, emergency room, Sunday School). Most of the selected settings (143) are types of places (like bus, library, sauna); 64 are named times (like bull session, Christmas, honeymoon).

Behaviors function differently than identities and settings in that many behaviors (such as challenge, disagree with, thank) can be used in various kinds of social relationships. Thus Table 1 shows large number of behaviors associated with each form of social

relationship. Additionally, a few specialized behaviors were chosen within each social institution (e.g., marry, convict, sell something to, salute, flunk, medicate, baptize).

Table 1: Number Of Concepts For Different Kinds Of Social Relationships



Note: Column sums are not meaningful since some concepts relate to multiple kinds of relationships

Modifiers were chosen to emphasize affective states, affective conditions, and frames of mind, though other considerations also entered the selection process. The selected concepts include 139 emotional states (e.g., at-ease, ecstatic, furious), 164 traits (e.g., adventurous, prejudiced, unambitious), 10 status characteristics (e.g., Black, old, rich), and 23 judgments about individual character or personas (e.g., evil, mature, unpopular).

The set of 1,500 stimuli is a reduction from the prior U.S.A. study which involved 2,200 stimuli. Much of the pruning involved eliminating concepts that have been found to be relatively useless in simulations of social interaction - e.g., to arm, to rook, an anesthetist, a railroad conductor. Other pruning decisions simply were difficult judgments. While more terms would be desirable for research purposes, the number of concepts had to be limited severely in order to minimize the numbers of respondents required, inasmuch as even minimal studies of this type require substantial sample sizes (as explained in the final paragraph of the next section).

Each concept is presented in a verbal frame to clarify its intended grammatical usage and meaning. Identities are preceded by the appropriate indefinite article, *a* or *an* (e.g., a lawyer, an old-timer), except for the two proper nouns in the set (God, Santa Claus). Settings also are presented in a frame beginning with an indefinite article (e.g., a fight, an office) except for proper nouns (April Fools Day, Christmas, Easter, Halloween, Hell, New Year's Eve, Thanksgiving Day) and two special settings that do not typically take articles (peacetime, wartime). Each behavior is presented in infinitive form with the object "someone" to emphasize its sense as a transitive social action (e.g., to condemn someone); prepositions also may be added to select among different senses of a verb (e.g., to laugh at someone, to laugh with someone). Modifiers are presented in the frame "*feeling* ___" if they are supposed to refer to emotional states (e.g., feeling delighted, feeling discouraged). Otherwise modifiers are presented in the frame "*being* ___" (e.g., being industrious, being narrow-minded). Occasionally additional wording is included to disambiguate different senses of a modifier (e.g., being cold toward someone).

Respondents

Respondents in this study are drawn from multiple regions of the U.S.A. at universities with good Internet facilities and with cooperative local representatives who recruit student volunteers to do on-line ratings. College students constitute a good target population for this work since the ideal respondents are culture experts rather than randomly selected population constituents. All past dictionaries of affective meaning have been compiled from ratings of students - university students usually, though pre-college students contributed to the Irish and German dictionaries.

Only a few background questions are required to distinguish major subcultures within the relatively homogeneous target population, namely:

- Are you [Male] [Female]?

- What is your dominant race? [White] [Black, African American, or Negro] [American Indian] [Asian or Asian American]
- Where in the U.S.A. did you mainly live prior to entering college? [New England = Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island] [Middle Atlantic = New York, New Jersey, Pennsylvania] [East North Central = Wisconsin, Illinois, Indiana, Michigan, Ohio] [West North Central = Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas] [South Atlantic = Delaware, Maryland, West Virginia, Virginia, North Carolina, South Carolina, Georgia, Florida, District of Columbia] [East South Central = Kentucky, Tennessee, Alabama, Mississippi] [West South Central = Arkansas, Oklahoma, Louisiana, Texas] [Mountain = Montana, Idaho, Wyoming, Nevada, Utah, Colorado, Arizona, New Mexico] [Pacific = Washington, Oregon, California, Alaska, Hawaii] [Not in U.S.A.]
- Which of these categories comes closest to the type of place you were living in when you were 16 years old? [In open country but not on a farm] [On a farm] [In a small city or town (under 50,000)] [In a medium-size city (50,000-250,000)] [In a suburb near a large city] [In a large city (over 250,000)]

Recruitment procedures vary from one campus to another. However, some form of remuneration generally is offered to participants - e.g., credit for an assignment in a course, or a dollar payment. Remuneration is handled as follows. After a respondent has rated all stimuli, and the data have been archived via the Internet, the Magellan system presents a web form on which the respondent enters name and email address in order to certify participation. The form emails the identifying information to a project manager who arranges remuneration to the respondent. The identifying information cannot be connected with the data that the respondent provided.

Mathematical analyses of consensus systems by Romney, Weller, and Batchelder (1986) indicate that relatively small numbers of respondents may be used to assess culturally-determined meanings. In fact, their analyses reveal that as few as a half-dozen expert informants can provide a very clear picture of how conditions are set within a culture. However, allowing that respondents are not all equally competent culture experts, that affective sentiments are relatively complex cultural phenomena, and that females and males might have different sentiments about some matters, it is desirable to have at least 25 males and 25 females rate each stimulus. These numbers correspond to the sample sizes used in almost all prior dictionary studies of cultural sentiments.

Though only about 50 respondents rate each stimulus, the project nevertheless involves large numbers of respondents at each site. The necessity for many respondents emerges as follows. Each respondent can rate only about 100 stimuli on three scales in the hour he or she contributes to the project, and therefore the total set of 1,500 stimuli has to be broken down into 15 subsets of 100. With 50 respondents for each subset, that necessitates a total of 750 or more respondents at each site.

Cross-Cultural Comparisons

A cross-cultural analysis of affective meanings measured in the past demonstrates the kind of intellectual benefits to be gained from the Magellan project. Six data sets are available: from the U.S.A. in the 1970s; from Canada in the 1980s; from Northern Ireland in the 1970s; from West Germany in the 1990s, from Japan in the 1990s, and from the People's Republic of China in 1999-2000. These data sets are like those to be obtained with *Surveyor* in that each contains mean EPA ratings for hundreds of social identities and social behaviors. A basis for cross-cultural comparisons exists in that many identities and behaviors were rated in multiple nations.

The questions to be answered in the simple analysis reported here are these. Do these different cultures - spanning three continents, four languages, and two political economies - show similarities in the affective meanings that they maintain for social identities and social behaviors? If similarities do exist, are they greater for neighboring countries, for countries sharing a language, for societies sharing a political economy?

The questions will be answered by computing product-moment correlations between societies, separately for identities and behaviors, and separately for E, P, and A. For example, find all of the identities that were rated both in the U.S.A. and in Canada, then compute the correlation between the mean evaluation ratings of these identities in the two nations; also compute the correlations between the mean potency ratings and between the mean activity ratings of these identities.

Figure 3: Correlations Of U.S.A. Identity Ratings With Ratings In Other Nations.



Figure 3, showing the correlations of U.S.A. mean ratings of identities with the mean ratings in other nations, reveals remarkable convergence of identity evaluations. For example, the back-most bar shows that Canadian evaluations of identities can be predicted well from U.S.A. evaluations of identities, the correlation coefficient for either males or females being above 0.9. The front-most bar shows that Chinese evaluation ratings of identities also can be predicted well from U.S.A. evaluation ratings of identities, the correlation coefficients being about 0.9. In fact, evaluations of identities in every country can be predicted from U.S.A. evaluations, with correlations of about 0.8 or above.

The U.S.A. potency and activity ratings of identities are somewhat less effective predictors of potency and activity ratings in other countries, but there still is convergence. U.S.A. sentiments are very good predictors of identities' potency and activity in Canada, and they are quite good predictors of identities' potency in China and Japan. Potency and activity of identities in Ireland are predicted fairly well from U.S.A. values. U.S.A. sentiments are least effective in predicting identities' activity in the two Asian countries, or in predicting either the potency or activity of identities in Germany. Yet even in these cases, the correlations nowhere fall below about 0.5.

Figure 4: Correlations Of U.S.A. Behavior Ratings With Ratings In Other Nations.



Analysis of behaviors proceeds the same as for identities. We find all behaviors that were rated in a pair of countries and compute correlations between the mean evaluation ratings, the mean potency ratings, and the mean activity ratings of the behaviors. Figure 4 shows the correlations between U.S.A. ratings of behaviors and those in other countries; the graphics in the figure are to be interpreted in the same way as with Figure 3.

Figure 4 reveals that sentiments about behaviors are more variable cross-culturally than sentiments about identities. However, the divergences are on the potency and activity dimensions rather than on evaluation. In fact, just as with identities, evaluations of behaviors in every country can be predicted from U.S.A. evaluations, with correlations of about 0.8 or above.

U.S.A. potency ratings of behaviors are only mediocre predictors of potency ratings in other cultures. The highest correlation (U.S.A. males with Canadian males) is a little above 0.7, while the lowest correlations (with Germany) are somewhat below 0.4.

U.S.A. activity ratings of behaviors are moderately good predictors of behavior activities in Canada, Germany, and Japan, but mediocre in the case of Ireland, and completely useless for predicting Chinese activity ratings of behaviors.

Table 2: Cross-Cultural Correlations Of Sentiments

	Identities						N	Behaviors						N
	Males			Females				Males			Females			
	E	P	A	E	P	A		E	P	A	E	P	A	
U.S.A. compared to														
Canada	0.94	0.92	0.90	0.94	0.92	0.88	700	0.96	0.74	0.81	0.96	0.60	0.76	586
Germany	0.85	0.68	0.63	0.82	0.70	0.65	419	0.87	0.37	0.72	0.86	0.38	0.67	281
Ireland	0.81	0.81	0.76	0.88	0.82	0.78	197	0.88	0.59	0.50	0.94	0.51	0.43	289
Japan	0.80	0.85	0.65	0.79	0.81	0.62	205	0.92	0.64	0.67	0.91	0.53	0.68	206
China	0.88	0.80	0.54	0.88	0.78	0.52	230	0.81	0.55	0.01	0.81	0.45	-0.06	232
Canada compared to														
Germany	0.84	0.71	0.65	0.82	0.71	0.65	419	0.85	0.46	0.69	0.86	0.55	0.68	279
Ireland	0.81	0.78	0.74	0.87	0.80	0.77	203	0.89	0.56	0.45	0.94	0.25	0.43	283
Japan	0.77	0.83	0.64	0.78	0.82	0.63	203	0.91	0.65	0.64	0.90	0.63	0.64	203
China	0.85	0.77	0.47	0.85	0.74	0.48	233	0.79	0.40	-0.03	0.79	0.36	-0.14	231
Germany compared to														
Ireland	0.79	0.65	0.52	0.82	0.67	0.57	147	0.77	0.18	0.31	0.83	0.06	0.41	145
Japan	0.67	0.69	0.62	0.68	0.67	0.63	161	0.82	0.50	0.67	0.82	0.56	0.68	111
China	0.86	0.71	0.33	0.85	0.71	0.37	180	0.69	0.26	-0.02	0.70	0.39	-0.05	130
Ireland compared to														
Japan	0.69	0.78	0.58	0.76	0.78	0.65	105	0.87	0.39	0.53	0.86	0.19	0.39	151
China	0.78	0.75	0.51	0.78	0.71	0.58	141	0.73	0.42	0.19	0.82	0.45	0.16	157
Japan compared to														
China	0.77	0.81	0.39	0.76	0.81	0.47	194	0.85	0.37	0.39	0.85	0.24	-0.12	149

Table 2 presents the correlations used in the two graphs, as well as additional information on how well sentiments in each culture predict sentiments in other cultures. N refers to the number of concepts that are shared in a pair of data sets, and is the number of observations for correlations to the left of the number.

The table reveals that evaluative structures are remarkably similar in these six societies, with a mean cross-culture correlation coefficient of 0.81 for social identities and 0.84 for behaviors. Geographic closeness has essentially negligible effect on similarity of

evaluations in that mean correlations among nations on the same continent (*identities*: males 0.83, females 0.84; *behaviors*: males 0.86, females 0.88) are barely higher than mean correlations between nations on different continents (0.80, 0.81; 0.84, 0.85). The mean correlation of identity evaluations within capitalist societies (males 0.80, females 0.82) is not higher than the mean correlation of capitalist identity evaluation with identity evaluations in China (0.83, 0.82). However, behavior evaluations do correlate higher within capitalist societies (0.87, 0.89) than between capitalist societies and China (0.78, 0.79). The three English-speaking societies have somewhat higher mean correlations of identity evaluations (0.85, 0.90) and behavior evaluations (0.91, 0.95) than do societies speaking different languages (0.79, 0.79; 0.83, 0.83).

Notions of who is relatively powerful and who is relatively powerless also are fairly similar across societies, with mean correlation coefficients of 0.77 for males and 0.76 for females. Geographic closeness increases similarity a little, with societies on the same continent correlating 0.03 higher than societies on different continents for males, 0.05 higher for females. Capitalist societies are no more in agreement with each other than they are with Communist China on this matter (the mean correlations are the same for males; 0.02 different for females). English-speaking societies have extra agreement about identity potencies (mean correlation of 0.84 for males and 0.85 for females).

Figure 5: Mean Evaluation And Potency Ratings Of Father (Top End Of Line), Mother (Middle Point), And Child (Bottom End Of Line) In Six Nations.



Thus there is considerable cross-cultural agreement in assessments of identities' goodness and power. Of course, the high correlations do not mean that the six cultures necessarily are the same in this regard. Figure 5 demonstrates this by zooming in on the identities of father, mother, and child. In Figure 5's display of sentiments regarding these identities, father is at the topmost end of each line, child is at the bottom end of each line, and mother is the middle point of each line. This chart is based on female sentiments, but it would look about the same were sentiment measurements from males used instead.

Figure 5 reveals visually that the mean evaluation and potency ratings of these family identities correlate highly across cultures. Also it is evident that everywhere fathers, mothers, and children are not bad, and mothers are the nicest of the three. Additionally all of these cultures agree that parents are powerful and children are powerless. Notwithstanding all these similarities, major differences arise.

- Japanese evaluate family members less positively than people in the other cultures, and a child actually is felt to be neither good nor bad in Japan.
- Chinese evaluate family members most positively; and the Chinese are different from people in the other five cultures in feeling that mothers are more powerful than fathers.
- Generally, parents are evaluated more positively than children, but not in Germany where fathers are felt to be less good than either children or mothers.
- Mothers generally are felt to be nicer than fathers, but this difference is negligible in the U.S.A. The power difference between fathers and mothers also is negligible in the U.S.A.

These differences among societies are sufficient to create substantial variations in the affective tone of family life. For example, computer simulations based on these data suggest that fathers are supportive to children in both Japan and China, but when situations get tense Japanese fathers turn into disciplinarians while Chinese fathers turn into coaches.

The remaining correlations in Table 2 concern the areas of greatest cross-cultural diversity.

Judgments of which acts have potent impact are dramatically less homogeneous than evaluations of acts, with a mean inter-society correlation of 0.47 for males and 0.41 for females. Societies on the same continent actually have lower agreement than those on different continents, by an increment of 0.05 for males and 0.15 for females. Capitalist societies agree somewhat more with each other about behavior potencies than they do with Communist China by an increment of 0.12 for males and 0.06 for females. Males in English-speaking nations have higher agreement than do males in nations speaking different languages by an increment of 0.21, though the difference for females is just 0.05.

Ideas about who is relatively active or passive are moderately shared across the cultures, with an average inter-culture correlation of 0.60 for males, and 0.62 for females. Being on the same as opposed to different continents has little impact with an increment of 0.01 for males and 0.03 for females. However, capitalist societies are much more like each other in judging people's activity than they are like Communist China, with an increment of 0.22 for males and 0.20 for females. Societies speaking English also are much more alike than societies speaking different languages, the difference being 0.28 for males and 0.26 for females.

Ideas about the spontaneity of actions have fairly low levels of similarity across cultures: the mean inter-culture correlations are 0.45 for males and 0.38 for females. Being on the same continent has no consistent effect: an increment of 0.07 for males and -0.04 for females. However, Communist China is very unique in this regard, correlating essentially zero with capitalist cultures, whereas the mean cross-cultural correlation among capitalist societies is 0.60 for both sexes. Societies speaking English appear to have more similarity than societies speaking different languages, but the difference disappears when China is removed from the analysis.

Conclusions.

People in the six Asian, European, and North American cultures largely agree about who is relatively good and who is relatively bad, and which actions are relatively right and which are relatively wrong. Even China—a communist society with a distinctive cultural tradition—is largely in agreement with the other societies.

There also is considerable agreement about what levels of dominance and submissiveness are suited to different social roles.

Greater diversity between cultures emerges with regard to the amount of activity appropriate to different roles. However, the primary realm of cultural diversity is in definitions of the weightiness and spontaneity of social actions.

There are issues to investigate with regard to the results. Are China's differences in activity sentiments due to political economy or to the nation's unique cultural history or to problems in the Chinese activity measurement scale? Are the higher similarities in sentiments among English-speaking nations due to shared language or to the historical legacy of British imperialism? Does the seeming inconsequence of geographic closeness vary with the permeability of political borders and with the extent of broadcast media? Answers to these questions will begin to emerge as Project Magellan assembles more cross-cultural data—from more nations both capitalist and communist, from more continents, from more language groups, from more nations with shared political histories.

Whatever the answers to all these questions, it appears that a remarkable result already is available. An international moral order circumscribes judgments of morality and the allocation of honor and stigma in interpersonal relations, and this moral order bridges human societies across continents, across political economies, and across languages. This finding might be considered the first of the intellectual benefits from Project Magellan.

Coda

Project Magellan builds on past advances in social science understandings and adds some new technology to enable a revolutionary level of efficiency and economy in collecting data about affective meanings in a culture. This opens exciting prospects for cultural analyses, both within societies and comparatively. As a result we can look forward to emerging insights into the nature of culture, society, and individual action, and the new knowledge will be solidly based on quantitative measurements.

Appendices

Appendix 1. 500 Social Identities

abortionist, adolescent, adult, adulterer, adulteress, advisor, Afro-American, agnostic, aide, Air Force reservist, Air Force enlistee, Air Force officer, alcoholic, alumnus, anti-Semite, applicant, apprentice, Army reservist, Army enlistee, Army officer, Asian-American, assistant, atheist, athlete, attorney, aunt, authority, baby, baby sitter, bachelor, baldy, battered woman, beginner, best friend, best man, big sister, big brother, big shot, bisexual, blind date, blonde, bootlicker, boozier, bore, born-again Christian, boss, bouncer, boy, boyfriend, brat, bride, bridegroom, bridesmaid, brother, brother-in-law, brunette, brute, buddy, bully, bum, bureaucrat, businessman, businesswoman, call girl, capitalist, Catholic, celebrity, chain-smoker, champion, chatterbox, child molester, child, chum, citizen, classmate, clergyman, client, clock watcher, co-worker, coach, coed, colleague, companion, competitor, computer expert, confidant, conservative, consultant, convalescent, cop, cousin, criminal, critic, crook, customer, date, daughter-in-law, daughter, deadbeat dad, defendant, defense attorney, delinquent, demagogue, detective, devil worshiper, devil, disciplinarian, district attorney, divorce lawyer, divorcé, divorcée, do-nothing, doctor, dropout, drunk, dummy, dyke, egghead, elder, employee, employer, enemy, entrepreneur, evangelist, ex-boyfriend, ex-girlfriend, ex-husband, ex-wife, executioner, executive, extrovert, failure, family man, fanatic, father, father in law, FBI agent, felon, female, feminist, fiancé, fiancée, firstborn, flight attendant, flirt, flunky, foe, follower, foreman, foster child, foster father, foster mother, freeloader, friend, gangster, gay, genius, gentleman, gigolo, girl Friday, girl, girlfriend, God, goof-off, gossip, graduate student, grandchild, granddaughter, grandfather, grandmother, grandparent, grandson, great grandfather, great grandmother, grind, grouch, grownup, guest, gun moll, gunman, guy, gynecologist, half brother, half sister, half-wit, handicapped person, handyman, has-been, hatemonger, head nurse, healer, helper, hero, heroine, heterosexual, Hispanic-American, hombre, homemaker, homosexual, honeymooner, hoodlum, hooker, host, hostess, hothead, hotshot, house husband, houseguest, housewife, hunk, husband, hussy, idiot, ignoramus, illegitimate child, infant, informer, innocent, insider, instructor, intern, interviewee, interviewer, intimate, introvert, invalid, jerk, Jew, jock, judge, juror, kid, klutz, know-it-all, laborer, lackey, lady, lady-killer, lawyer, leader, lecher, lecturer, lesbian, liar, liberal, librarian, little brother, little sister, loafer, lobbyist, loser, loved one, lunatic, malcontent, male, malingerer, mama's boy, man, manager, manageress, maniac, Marine Corps reservist, Marine Corps enlistee, Marine Corps officer, masochist, matriarch, mental case, merchant, millionaire, minister, miser, mistress, mobster, moron, mother, mother-in-law, mourner, mouthpiece, mugger, murderer, murderess, nark, Native-American, Navy reservist, Navy enlistee, Navy officer, negotiator, neighbor, nephew, neurotic, newlywed, niece, nobody, nonsmoker, novice, nurse, nut, nymphomaniac, office boy, old-timer, old geezer, old maid, opponent, opportunist, organizer, orphan, outlaw, pagan, pal, paranoid, parent, parolee, partner, passerby, pastor, patient, patriot, patrolman, pauper, pedestrian, pediatrician, pessimist, pest, physician, pickpocket, pickup, pimp, plainclothesman, playmate, police officer, politician, pornographer, practical nurse, preacher, priest, priestess, principal, private eye, probationer, professor, prosecuting attorney, prostitute, protégé, Protestant, protester, psychiatrist, psychopath, psychotic, public defender, punk, pupil, purchaser, quack, queer, questioner, rabbi, racist, racketeer, rapist, receptionist, redhead, registered nurse, relative, retiree, right-hand man, right-winger, rival, robber, role model, roommate, sadist, saint, salesclerk, saleslady, salesman, Santa Claus, sawbones, schizophrenic, scholar, schoolboy, schoolgirl, schoolmate, schoolteacher, scientist, scrooge, secretary, senior citizen, serial murderer, server, sexist, sheriff, shop clerk, shopkeeper, shoplifter, shopper, shrink,

sibling, sick person, sinner, sister, sister-in-law, skilled worker, skirt chaser, slut, small businessman, smoker, son, son-in-law, soul mate, spendthrift, spinster, spokesman, spokeswoman, sponger, sports fan, spouse, state trooper, steady, stepbrother, stepchild, stepdaughter, stepfather, stepmother, stepparent, stepsister, stepson, stoolpigeon, stranger, strike breaker, strike leader, stud, student, student teacher, stuffed shirt, subordinate, superior, superordinate, supervisor, supporter, surgeon, survivor, suspect, sweetheart, swinger, taxpayer, teacher, teammate, tease, teenager, temporary worker, tenant, terrorist, thug, toady, toddler, tomboy, tot, trainee, traitor, traveler, troublemaker, truant, true love, tutor, tyke, uncle, underachiever, underdog, undergraduate, unemployed person, union member, university student, vacationer, victim, vigilante, villain, VIP, visitor, voter, voyeur, waiter, waitress, white supremacist, whiz kid, whore, widow, widower, wife, wife abuser, windbag, winner, witness, woman, womanizer, worker, workman, workmate, yes-man, youngster, youth

Appendix 2. 200 Settings for Social Interaction

abortion clinic, adult bookstore, airplane, amusement park, April Fools' day, assembly line, athletic club, auction, ball game, banquet, bar, barber shop, basketball game, battlefield, beach, beauty salon, bed, bedroom, board room, bowling alley, brothel, bull session, bus, bus stop, business meeting, cafe, cafeteria, camp, campground, campus, car, carnival, casino, cathedral, Catholic mass, celebration, cemetery, chapel, Christmas, church, classroom, clinic, cocktail lounge, coffee break, coffee house, committee meeting, concert, conference room, cook-out, country club, courtroom, crowd, dance, daycare center, debate, desert (dry place), dining room, disco, doctor's office, dorm room, drive-in movie, Easter, elevator, emergency room, encounter group, examination, execution, factory, fairground, family reunion, festival, fight, fire drill, flea market, flophouse, funeral, funeral home, gay bar, ghetto, government office, graduation ceremony, graveyard, greasy spoon, grocery store, gunfight, gymnasium, Halloween, health food store, Heaven, Hell, hideout, home, honeymoon, hospital room, hotel room, interrogation, interview, jail, kitchen, laboratory, ladies' room, lawyers office, lecture, library, living room, locker room, lovers lane, luncheon, luncheonette, lunchroom, marriage counselor's office, massage parlor, maternity ward, mealtime, meeting, memorial service, men's room, mental hospital, military base, military boot camp, mob, mobile home, motel room, museum, New Year's Eve, nightclub, nursery school, nursing home, office, operating room, orgy, parade, party, peacetime, penitentiary, pizzeria, playground, police station, pool hall, poorhouse, post office, prayer meeting, press conference, prison, psychiatrist's office, quiz, reception, refreshment stand, resort, restaurant, retirement home, riot, saloon, sauna, schoolroom, seminar, sermon, shopping center, shower room, skid row, slaughterhouse, slum, sorority house, soup kitchen, squad car, store, street, street fair, subway, Sunday School, supermarket, sweatshop, swimming hole, tavern, taxi, temple, tennis court, tent, test, Thanksgiving Day, theater, topless bar, town hall, town meeting, train station, vacation, village, waiting room, wartime, washroom, wedding, wedding night, wedding reception, week night, weekend, welfare office, warehouse, wilderness, worship service, zoo

Appendix 3. 500 Social Behaviors

abandon, abuse, accommodate, accuse, address, admonish, advise, agree with, aid, amuse, analyze, answer, apologize to, appeal to, applaud, apprehend, approach, argue with, arrest, ask someone out, ask someone about something, assail, assault, assist, attack, attend to, babble to, baby, back, badger, banter with, baptize, bargain with, barter with, bash, bathe, bawl-out, be intimate with, be sarcastic toward, beam at, beat up, beckon to, bed, beg, belittle, bellow at, berate, beseech, bicker with, bill, bind, bite, blabber to, blame, bless, bootlick, booze with, borrow money from, boss around, bow to, brawl with, bribe, brief, browbeat, brown-nose, brutalize, bully, cajole, capture, care for, caress, catch, caution, challenge, chase, chastise, chat up, chat with, chatter to, cheat, cheat on, cheer, cheer up, chew out, chide, chitchat with, choke, cling to, club, coach, coddle, coerce, collaborate with, combat, comfort, command, compensate, compete with, compliment, compromise with, concur with, condemn, confer with, confess to, confide in, confine, confront, congratulate, console, conspire with, consult with, contemplate, contradict, converse with, convict, correct,

counsel, criticize, cross-examine, cuddle, cue, curry favor from, curse, cuss, cut the pay of, damn, dance with, dare, debate with, debrief, defeat, defend, defer to, defy, degrade, demean, demote, denigrate, denounce, deny something to, deprecate, deride, desire someone sexually, dicker with, dine with, direct, disagree with, discipline, discourage, discuss something with, disobey, disparage, disrobe, dissuade, distract, divorce, dote on, draw near to, dress, dress down, drink to, drink with, drone on at, eat with, educate, elbow, embrace, employ, encourage, entertain, entreat, escape, exalt, examine, excuse, execute, exonerate, explain something to, exploit, extol, eye, face, feed something to, fib to, fight, financially back, fine, fingerprint, fire someone from a job, flatter, flee, flirt with, flunk, follow, fondle, forget, forgive, fornicate with, frisk, frown at, fuss over, gape at, gawk at, gaze at, giggle at, giggle with, give a raise to, give instructions to, give medical treatment to, glance at, glare at, glorify, glower at, gossip with, grab, grade, grapple with, grasp, greet, grin at, groom, grouse to, guide, gyp, haggle with, hail, halt, hand something to, handcuff, harangue, harass, harm, hassle, have sex with, heal, heckle, help, hire, hit, hold, holler at, hoot at, horse around with, hound, hug, hurry, hurt, hush, ignore, imitate, implore, imprison, incarcerate, incriminate, indoctrinate, inform, inject someone with medicine, injure, inspect, instruct, insult, interrogate, interrupt, interview, jail, jeer at, jest with, joggle, join up with, joke with, josh, jostle, kick, kid, kill, kiss, knife, knock out, kowtow to, laud, laugh at, laugh with, lay-off someone from a job, lead, leave, lecture, leer at, lend money to, lie to, listen to, look at, look away from, lunch with, lust for, make a business proposal to, make eyes at, make fun of, make love to, make out with, make up with, malign, march with, marry, massage, medicate, mimic, mind, mock, molest, monitor, mother, mouth off to, mug, mumble to, murder, murmur to, nag, needle, neglect, negotiate with, nestle, nudge, nuzzle, obey, observe, obstruct, ogle, oppose, order, overcharge, overpower, overwhelm, overwork, pamper, parody, pay for, pay someone for something, peek at, peep at, penalize, pester, pet, photograph, pinch, place an order with, play with, plead with, point at, poke, poke fun at, pooh pooh, praise, pray with, prod, promise something to, prompt, propose marriage to, prosecute, protect, pull away from, punch, punish, pursue, push, put someone to bed, quarrel with, query, question, quibble with, quiet, quiz, raise the pay of, rant at, rape, ravish, reason with, reassure, rebuff, rebuke, reform, rehabilitate, remind, renounce, reply to, reprimand, reproach, request something from, rescue, restrain, retaliate against, reward, rib, ridicule, rob, rough-house with, rouse, salute, save, say farewell to, scoff at, scold, scowl at, scratch, scream at, scrutinize, search, seduce, seize, sell something to, sentence, serenade, serve, sexually arouse, sexually proposition , shake hands with, share something with, shoot, short-change, shout at, shove, show something to, shush, silence, sing to, sit next to, slap, sleep with, slug, smile at, smirk at, snarl at, sneer at, snuggle, sock, soothe, sound out, spank, speak to, squeeze, stab, stammer at, stare at, stare down, steal from, stop, strangle, strip, stroke, study, subdue, submit to, suck up to, sue, suggest something to, supervise, surprise, sympathize with, tackle, take hold of, talk down to, talk shop with, talk to, teach, tease, tell off, tell something to, test, thank, threaten, tickle, toady to, toast, torment, torture, touch, train, transact business with, treat, tug, turn to, underpay, undress, upbraid, urge on, victimize, wait on, walk out on, warn, wash, watch, welcome, wheedle, whine to, whip, whisper to, wink at, work, wrestle with, yell at, yield to

Appendix 4. 300 Individual Modifiers

abusive, accommodating, adventurous, affectionate, afraid, aggravated, aggressive, agitated, alarmed, aloof, ambitious, amused, angry, anguished, annoyed, antisocial, anxious, apathetic, apprehensive, arrogant, ashamed, at-ease, authoritarian, awe-struck, bitter, Black, blue, bossy, brave, bright, broad-minded, broken-hearted, calm, careless, cautious, charmed, cheerful, cheerless, childish, cocky, cold toward someone, compassionate, competent, competitive, compulsive, conceited, confident, conscientious, considerate, contemptuous, contented, contrite, cooperative, courageous, cowardly, cruel, crushed, cynical, daring, defensive, defiant, deflated, dejected, delighted, dependable, dependent, depressed, despondent, disappointed, disapproving, discontented, discouraged, disgusted, disheartened, dismayed, displeased, dissatisfied, distressed, dogmatic, domineering, downhearted, eager, earnest, easygoing, ecstatic, egotistical, elated, embarrassed, enraged, enthusiastic, envious, euphoric, evil, exasperated, excited, extroverted, fearful, fed-up, female, feminine, finicky, flustered, foolish, forgiving, friendly, frightened, frustrated, furious, generous, gentle, glad, gleeful, gloomy, glum, greedy, grief-stricken, grouchy, gullible, happy, hardworking, heart-broken, heavy-hearted, helpful,

homesick, honest, horny, horrified, hostile, hotheaded, humble, humiliated, hurt, idealistic, ill-at-ease, imaginative, immature, immoral, impatient, inconsiderate, indecisive, independent, indignant, industrious, infatuated, inhibited, insecure, insensitive, insincere, intelligent, intolerant, introspective, introverted, irate, irked, irritable, irritated, jealous, joyful, joyless, jubilant, kind, lazy, lonely, lonesome, lovesick, lustful, mad, male, masculine, mature, mean, meek, melancholy, merry, middle-aged, mischievous, miserable, miserly, modest, mortified, mournful, moved, naive, narrowminded, nervous, nostalgic, obedient, old, open-minded, optimistic, outgoing, outraged, outspoken, overjoyed, overwhelmed, panicked, passionate, patient, peaceful, peeved, perceptive, persistent, pessimistic, petrified, petty, placid, playful, pleased, polite, pompous, poor, popular, prejudiced, proud, quarrelsome, raunchy, rebellious, reckless, regretful, relaxed, relieved, remorseful, repentant, resentful, responsible, reverent, rich, rude, ruthless, sad, sadistic, saintly, sarcastic, satisfied, scared, scornful, self-centered, self-conscious, self-denying, selfish, self-pitying, self-righteous, self-satisfied, sensitive, sentimental, serene, shaken, shocked, shrewd, shy, sickened, sincere, sly, smug, soft-spoken, sorrowful, sorry, spiteful, stingy, strict, stubborn, stupid, submissive, suicidal, suspicious, sympathetic, tactful, temperamental, terrified, thankful, thoughtless, thrilled, timid, tolerant, tormented, touched, trusting, unadventurous, unambitious, understanding, uneasy, unfair, unfriendly, unhappy, unimaginative, unpopular, unreliable, upset, uptight, vain, vengeful, violent, virtuous, warm, White, wild, wise, withdrawn, worried, young

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2. The Java code for Surveyor is publicly available at http://www.indiana.edu/~socpsy/public_files/SurveyorJava.zip. Thus alternate centers using Surveyor can be set up on any server that has archiving software comparable to Indiana University's Transform program (see http://webmaster.indiana.edu/tool_guide_info/transform3.shtml).

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