

Cultural Recipe Explanations of Consumer Tipping Behavior

Graham Ferguson, Curtin University, Australia

Carol M. Megehee, Coastal Carolina University, USA

Arch G. Woodside, Boston College, USA

December 2014

Send correspondence to Graham Ferguson, Curtin University, School of Marketing,
Curtin Business School, GPO Box U1987, Perth WA 6845, telephone: +61 8 9266 3882
(g.ferguson@curtin.edu.au); Carol M. Megehee, Coastal Carolina University, E. Craig
Wall Sr. College of Business Administration, Department of Marketing and Resort
Tourism, P.O. Box 261954, Conway, SC 29528-6054 USA, telephone: +1 843-349-2706
(cmegehee@coastal.edu); Arch G. Woodside, Boston College, Carroll School of Management,
Department of Marketing, 140 Commonwealth Avenue, Chestnut Hill, MA.

Cultural Recipe Explanations of Consumer Tipping Behavior

Abstract

Paradoxically, while researchers appear to agree that a culture represents a “complex whole which includes knowledge, belief, art, morals, custom and any other capabilities and habit acquired by man [person] as a member of society” (Tylor, 1871/1920), the dominant logic in studying culture is using symmetric tests (e.g., correlation/regression analysis), that is, to deconstruct the ingredients in a culture’s complex whole and report on the “net effect” of the impact of each ingredient (i.e., each specific capability and habit). The present article proposes a holistic (“recipe” or “algorithm”) postpositivistic approach to theory and data analysis to examine the impacts of alternative cultural complex wholes on consumer tipping behavior. The study here includes substantially re-examining and extending two studies by Lynn et al. (1993) and Lynn (2000). The present findings support core tenets of complexity theory (equalfinality, opposing ways individual ingredients contribute to the same outcome, and causal asymmetry) and offer a deeper, richer, perspective of how cultures’ affect consumer behavior than conventional positivistic tests. The study illustrates Gigerenzer's (1991) wisdom that scientists' tools are not neutral (i.e., tools-in-use influence theory formulation as well as data interpretation).

Keywords: tipping behavior; culture; asymmetric testing; complexity theory

1 INTRODUCTION

Most positivistic research on how culture influences particular aspects of consumer behavior focuses on reporting the net effects of individual cultural dimensions rather than cultures' consequences per se. The dominant focus of these studies is on explaining the unique variance of the behavior associated with the variance of a cultural dimension using the symmetric testing tools of correlation and regression analyses. Studies by Lynn, Zinkhan, and Harris (1993) and Lynn (2000) are exemplars of this focus. For example, using data from Hofstede's (1980) four principal cultural values and Star's (1988) report on consumer tipping behavior, Lynn et al. (1993) hypothesize a positive relationship between tipping and power differences, individualistic, and masculinity scores for each country and a negative relationship between tipping and uncertainty avoidance. Lynn et al. (1993) report statistically significant positive relationships with tipping for power distance and masculinity—and contrary to the hypotheses—a positive relationship for uncertainty avoidance and a significant negative association for individualism and tipping after removing Japan as a statistical outlier. From a positivistic effect size (Cohen, 1977) perspective, the direction of the impacts of each of the four dimensions (sans Japan) is medium-to-large ($r^2 > 0.15$) and positive (negative for individualism).

In contrast to the dominant positivistic logic of estimating the individual net effects of cultural variables (see Samaha, Beck and Palmatier, 2014, for a recent example which explores interactions between the dimensions to investigate culture's overall effect), the study here proposes applying complexity theory (Byrne & Callaghan, 2013; Gummesson, 2008; Urry, 2005; Waldrop, 1992; Woodside, 2014) and configural analysis to represent cultures as “complex wholes which includes knowledge, belief, art, morals, custom and any other capabilities and habit acquired by man as a member of society” (Tylor, 1871/1920, p. 1); the study tests the

impacts of alternative configurations (i.e., complex wholes or “recipes”) on tipping behavior.

The proposal includes a number of theoretical tenets that are testable using post-positivistic tools. These post-positivistic tools complement and extend symmetric testing methods such as regression analysis and go beyond a net-effects theoretical stance and reporting of findings. The post-positivistic tools include asymmetric rules for identifying cases in the highest (lowest) quintiles of a few antecedent conditions to indicate an outcome condition such as high performance (McClelland, 1998) and they use set-membership analytical techniques appropriate for complex configuration analyses (Ragin, 2008a); these tools do not attempt to predict low versus high values for a dependent variable but focus on identifying cases having specific combinations of antecedent conditions that associate with high scores on an outcome (e.g., high number of industries with tipping).

The present study illustrates Gigerenzer’s (1991, p. 19) perspective, “Scientists’ tools are not neutral”—methods-in-use influence theoretical perspective and precepts. The set-theoretic approach (Fiss, 2007; Ragin, 2000, 2008a; Ragin, Shulman, & Weinberg, 2003) in the proposal matches particularly well with Tylor’s (1871/1920) complex whole proposal for the study of culture and refocuses theory from a net effect per variable to a configural case-level perspective. The prime research questions in the present study address the following issues. First, are alternative configurations of cultural values—complex wholes—useful in indicating high tipping-behavior countries? Second, are alternative configurations of cultural values useful in indicating countries where tipping occurs infrequently? Third, does the addition of other national cultural indicators (i.e., purchasing power parity data, religiosity; income dispersion) into cultural value recipes improve the ability of indicating frequency of tipping behavior? Fourth, if useful does the configurational theory/method extend effectively to additional

antecedent typologies beyond Hofstede's typology for explaining tipping behavior; for example, do recipes of individual motives using McClelland's (1961) motives typology indicate high and low tipping behavior

The answers found below support a configurational theory of "cultures' consequences" (Hofstede, 1980) on consumer tipping behavior and for adopting a more complex stance to theory and data analysis than the conventional view of proposing and estimating net effects of influence of independent variables on a dependent variable using symmetric tests. Regarding complementing the dominant logic of symmetric testing, while not referring to complexity theory, Ordanini, Parasuraman, and Rubera (2014) offer a similar conclusion in their study of antecedent configurations of customer adoptions of new services.

Following this introduction, section two is a discussion of core tenets of complexity theory and how these tenets are relevant to the foundational view that configurations of antecedents rather than the net effects of individual variables offer a deeper, richer, explanation of specific behaviors (e.g., high tipping frequencies across industries). Using the core tenets of complexity theory, section three develops specific propositions relevant for explaining how configurations of cultural values, individual motives indicate high or low tipping behavior, and additional cultural dimensions may affect tipping behavior. Section four describes the data and their collection in two separate studies to examine the specific propositions. Section five describes the analytics involved in testing the specific propositions. Section six presents the findings for the first study (i.e., the prevalence of industries where tipping is practiced across cultures). Section seven presents the findings for the second study. Section eight concludes with a discussion of contributions to theory, limitations, and suggestions for future research.

2 CORE TENETS OF COMPLEXITY THEORY

Urry (2005) provides a far-ranging literature review of complexity theory in the natural and social sciences and offers many useful insights. “Relationships between variables can be non-linear with abrupt switches occurring, so the same ‘cause’ can, in specific circumstances, produce different effects” (Urry, 2005, p. 4); and, “If a system passes a particular threshold with minor changes in the controlling variables, switches occur such that a liquid turns into a gas, a large number of apathetic people suddenly tip into a forceful movement for change (Gladwell, 2002). Such tipping points give rise to unexpected structures and events” (Urry, 2005, p. 5). Similarly, Greckhamer, Koro-Ljungberg, Cilesiz, and Hayes (2008) and Ordanini, Parasuraman, and Rubera (2014) suggest that outcomes of interest rarely result from a single causal factor; causal factors rarely operate in isolation; and, the same causal factor may have different—even opposing—effects depending on the context.

Dissatisfied with the limitations of symmetric tests such as regression analysis and analysis of variance, McClelland (1998) goes further in stressing that most researchers do not really want to explain variance in dependent variables; what they want to do is to describe, explain, and accurately predict high scores in an outcome condition (i.e., create algorithms—decision rules—that work almost all the time in providing an effective decision and avoiding bad decisions). Without likely being aware of McClelland's (1998) contributions to asymmetric thinking, research methods, and parsimony, Ragin (2000, 2006, 2008a) relies on Boolean algebra and set theory principles rather than the now dominant research paradigm of using of matrix algebra with additive-based statistical methods to offer parallel insights and data analysis methods in sociological research and beyond (e.g., Ordanini et al. 2014; Woodside 2014).

Configural or set theory methods such as qualitative comparative analysis (QCA) propose that the influence of antecedents (e.g., cultural values) on a specific outcome (e.g., tipping behavior) depends on how the antecedents are combined, rather than on the levels of the individual antecedents per se. These methods use Boolean algebra rules to identify which of the antecedent combinations, if any, act as sufficient or necessary conditions for the outcome (Fiss, 2007; Ordanini, et al., 2014; Woodside 2013). The present study's findings confirm that individual cultural values have complex trade-off effects and that only certain combinations of antecedents act as sufficient conditions for high tipping (or low) behavior. A high or low score for the same cultural antecedent sometimes associates with high tipping behavior—which depends on what additional antecedent conditions occur in the complex wholes of alternative cultural descriptions.

Consequently, the following statements express core tenets (Ti) of complexity theory. These tenets are likely relevant to wide-range of consumption-related behaviors but are expressed in terms of the study of antecedent conditions affecting high (low) tipping behavior. T1, the equifinality tenet: a few-to-several configurations of antecedent conditions associate with high-tipping behavior; thus, a high score for a given recipe (configuration) may be sufficient in indicating a high outcome (e.g., tipping frequency across industries) for a given case (country) but this recipe is not necessary for the high outcome score to occur. T2: For different cases both high and low scores for the same simple antecedent condition (e.g., individualism) can appear in two different recipes whereby both associate with a high score in an outcome condition. Thus, a statistically significant, large effect-size, main effect of the simple independent variable on a dependent variable may cause a researcher to fail to notice the occurrence of several contrarian cases to this main effect; explaining these contrarian cases with

additional algorithms (i.e., recipes or configurations) serves to increase the information of a study. T3, causal asymmetry: the same simple antecedent condition can appear in both positive and negative versions of the same outcome condition, and more generally, the recipes indicating the negation of an outcome condition are not the mirror opposites of the recipes indicating a positive response for the same outcome condition. Support for T3 occurs because asymmetric algorithms provide recipes whereby a case's high score for the recipe indicates a high score for the outcome—and low and high scores can and usually do occur for the outcome condition for cases with low scores for this same recipe. Asymmetric recipes include no predictions about outcome scores for low scores for the antecedent recipes.

T4: high scores for a simple antecedent condition may be necessary condition but the simple condition is rarely sufficient for a high score for an outcome condition. Thus, a nation high in income may be a necessary condition for high-tipping frequency across industries but high income alone is not a sufficient condition for high tipping behavior to occur. (This illustration of a necessary condition does not hold in the present study; high income is not found to be necessary across all recipes associating with high tipping behavior.)

3 HOW CONFIGURATIONS OF CULTURAL VALUES, INDIVIDUAL MOTIVES, AND ADDITIONAL CULTURAL DIMENSIONS INDICATE TIPPING AND NOT TIPPING BEHAVIOR

3.1 Moving beyond Symmetric Testing of Hofstede's Cultural Consequences' on Tipping Behavior

Lynn, Zinkhan, and Harris (1993) offer hypotheses specific to individual cultural values but do not offer predictions about any unique configurations of these simple antecedents on tipping behavior. To create a new data set, they combine secondary data on the cultural values

of 30 nations (Hofstede, 1980) and the tipping practices in 33 industries in these same 30 nations (Star, 1988) to test four hypotheses. Here are the hypotheses and principal findings that Lynn et al. (1993) present. H1: Tipping will be less prevalent in those countries where residents have a low tolerance for status and power differences among people. Thus, high versus low power distance (PD) increases tipping. One rationale for H1: high tipping is one way to display high PD to others and to confirm high status of self in high PD cultures. The findings support H1: Across all 30 countries, PD correlates at .40 ($p < .03$) with the prevalence of tipping. Removing Japan as a statistical outlier increases the correlation to .46 ($p < .02$).

H2: Tipping will be less prevalent in those countries where residents have a low tolerance for uncertainty. Thus, high uncertainty avoidance will *decrease* tipping. Rationale: Tipping increases customer uncertainty; the norms governing tipping are many and varied so customers are often uncertain about how much to tip or even whether they should tip at all; thus, when uncertainty is high, customers may not tip—they avoid the behavior. Findings: Contrary to expectations, tipping was more (not less) prevalent for countries with high uncertainty avoidance; $r = .42$, $p < .02$ for the 30 countries. Thus, H2 fails to receive support.

H3: Tipping will be less prevalent in those countries where residents value strong, communal ties to the organizations for which they work. Thus, tipping will be more prevalent in those countries where residents highly value individualism. Rationale offered by Lynn et al. (1993) is that it is generally considered inappropriate to give money as a gift or as a form of reciprocation in close social relationships. Findings: Contrary to expectations, tipping was more (not less) prevalent in communalistic countries than in individualistic ones; $r = -.33$, $p < .08$ for the 30 nations, and $r = -.39$, $p < .04$ with Japan's data deleted as an outlier. Thus, H3 fails to receive support. However, high perceptions of tipping contexts are unlikely to include close

social relationships and likely to reinforce individualistic options and opportunities to tip; this alternative rationale supports a positive individualism and tipping behavior relationship.

H4: Tipping will be less prevalent in those countries where residents place a high value on social as compared with economic relationships. In positive terms, nations placing a high value on economic versus social relationships will tip more frequently. Rationale offered by Lynn et al. (1993): Monetary tips weaken the social relationships between customers and service workers and reduce their interactions to economic exchanges. High masculinity relates to assertiveness, the acquisition of money and things, and not caring for others while, high femininity relates to social relationships. Findings: H4 receives support. Across all 30 countries, the correlation between masculinity and tipping is positive, $r = .26$, $p < .17$. Omitting Japan from the analysis as an outlier, the masculinity index correlates at $.47$ ($p < .02$) with the number of tipped professions. Tipping does appear to be less prevalent in countries with feminine values that emphasize social relationships compared with countries with masculine values that emphasize achievement and economic relationships; in positive terms, high masculinity is an indicator of high tipping behavior.

The hypotheses presented by Lynn et al. (1993, p. 483) include some confounding statements: “Tipping increases power relationships”, “tipping increases uncertainty”, “tipping weakens organizational commitment”, and “tipping weakens social relationships.” These statements reverse the flow of relationships examined in the study. The study proposes that cultural values affect tipping frequency and not that tipping affects cultural values.

Using complexity theory and Boolean algebra, the present study considers specific alternative configural statements that go to the heart of Lynn et al.’s (1993) study. Model 1 (considered below) represents the relationships hypothesized by Lynn et al. (1993), model 2

represents the results found by the same authors, models 3 and 4 suggest alternative configurations that could explain tipping, and model 5 offers a configuration that could explain not tipping in Japan. Each of these statements includes culture as complex wholes to more comprehensively explain the phenomenon studied. The first model offers a recipe consistent with the four independent hypotheses in Lynn et al.'s (1993) study:

$$(PD \bullet \sim UA \bullet ID \bullet MA) \leq TF \quad (1)$$

where TF = tipping frequency count by industry; PD = power distance; UA = uncertainty avoidance; ID = individualism; MA = masculinity; “•” a mid-level dot indicating the Boolean logical “AND” condition; and “~” a sideways tilde symbol indicating the negation of a calibrated score for a cultural value (i.e., 1 – the cultural value score for a nation).

Model 2 offers a model that is consistent with the findings of Lynn et al. (1993):

$$(PD \bullet UA \bullet \sim ID \bullet MA) \leq TF \quad (2)$$

Model 3 offers an alternative configuration that expresses the perspective that consumers in high uncertainty avoidance cultures are likely to tip to avoid the seemingly worse mistake of omission than commission—avoiding a social gaffe trumps the economic value of retained money. Model 3 includes the perspective that high individualism is expressed by tipping—tipping demonstrates financial independence and capability. Model 2 includes the perspective that high uncertainty avoidance is expressed by tipping—tipping may help avoid the self-perception of being socially inept.

$$(PD \bullet UA \bullet ID \bullet MA) \leq TF \quad (3)$$

Model 4 includes the perspective that socially supportive cultures show such support via tipping.

$$(PD \bullet UA \bullet ID \bullet \sim MA) \leq TF \quad (4)$$

Additional configurations are likely to occur that indicate high-tipping behavior. Given the possibility of a positive, negative, and no influence for each cultural value, a total of 81 configurations are possible in a property space analysis (Lazarsfeld, 1937) of all possible combinations of the four dimensions. The 81 configurations include the recipe that no combination of these four cultural values affects tipping behavior.

The current study also explores the effect of cultural influence on not tipping. Exploring not tipping offers the opportunity to address the challenge of explaining low tipping frequency in Japan (something that Lynn et al.(1993) were unable to do) and to apply the causal asymmetry tenet (T3). Model 5 is an expression of a cultural value configuration that indicates the highest score possible for Japan.

$$(PD \cdot UA \cdot \sim ID \cdot MA) \leq \sim TF \quad (5)$$

Model 5 is an example of one of the 81 possible configurations of the four cultural values that may predict not tipping frequency accurately.

While theory should drive the study of configurations of cultural values and other cultural dimensions, cultures are complex entities. A priori specifying how a cultural recipe (configuration) affects a specific consumption behavior is hard and unlikely to be successful based on combinations of only four cultural dimensions. Introducing additional complexity is likely to be necessary to decipher how a nation's culture explains tipping and not-tipping behavior. This issue is taken up again below.

3.2 Moving beyond Symmetric Testing of McClelland's Theory of Motivation and Tipping Behavior

Lynn (2000) extends research on individual cultural influences on tipping behavior. His study examines country data for McClelland's (1961) need for achievement (nAch), need for

affiliation (nAff) and need for power (nPow) and tested their singular and additive effects on tipping frequency using the Star (1988) tipping frequency across industries.

nAch is an intrinsic desire to perform well against a standard of excellence (McClelland, 1961). “This need may relate positively to the prevalence of tipping because tipping is supposed to be an incentive/reward for excellent service in other words, it is supposed to be a reward for server achievement (Lynn et al., 1993). People with a high need for achievement may be particularly accepting/supportive of customs that reward achievement” (Lynn, 2000, p. 206). Lynn (2000, p. 206) also points out that a negative nAch and tipping frequency relationship may occur, “Such an extrinsic motivation system should be less necessary (and, therefore, may be less prevalent) in countries characterized by a strong intrinsic need for achievement than in countries where this need is weaker.”

nAff is a desire for warm, close relationships with other people (McClelland, 1961). Lynn (2000) provides rationales that either a positive or negative symmetric relationship occurs between nAff and tipping frequency.

People for whom this need is strong may find tipping customs particularly appealing, because tipping is supposed to provide servers with an incentive for delivering attentive and friendly service (Lynn et al., 1993). . . . On the other hand, people with a strong need for affiliation also have a reason to dislike tipping. Tips are monetary incentives/rewards which turn server-customer interactions into economic rather than social exchanges (Lynn et al., 1993). This aspect of tipping should bother people who desire warm, close personal relationships. (Lynn, 2000, p. 206-207)

The present study takes up the possibility that nAch and nAff each has positive and negative relationships with high-tipping frequency—which depends on the alternative antecedent recipes that relate to high-tipping frequency. nPow is a desire for the means of influencing other people (McClelland, 1961). Lynn (2000) proposes that people high in nPow may find tipping customs particularly appealing because tipping is an incentive/reward that gives consumers power over servers (Lynn et al., 1993).

McClelland (1961) provides country values for the nAch, nAff, and nPow; he coded up to 21 stories for each of 40 countries from children's readers published between 1946 and 1955 for content reflecting the three needs. Coding instructions were based on extensive research examining the effects on thematic-apperception-test stories of experimental manipulations of the relevant needs. The validity of the resulting national motivation scores was demonstrated by their theoretically intelligible relationships to economic growth, birth rates, and political systems as McClelland (1961) reports.

Lynn's (2000) findings provide support of a positive influence for one of the three motives. Countries in the two data sets overlap for 27 countries. The number of tipped industries correlated at $r = 0.50$ ($p < 0.004$) with the need for achievement; at $r = -0.16$ ($p < 0.42$) with the need for affiliation; and at $r = 0.05$ ($p < 0.80$) with the need for power. Lynn (2000) decided that removing two countries (Brazil and New Zealand) from the data set as statistical outliers would be useful—the removal of both was due to poor fit to the regression predictions. Lynn (2000, p. 208) mentions, "Brazil's status as an outlier may be attributable to poor measurements of national motives for this country." He is unable to conjecture an explanation for New Zealand being an outlier, "New Zealand had the most extreme residual, the only outlying residual with a negative value, and the fewest tipped professions in this sample."

These considerations suggest that some unique characteristic of New Zealand creates an inhospitable climate for tipping in that country. Identifying that characteristic is left to future research” (Lynn, 2000, p. 208). With the removal of the two outliers, Lynn (2000) reports the number of tipped professions correlated at $r = 0.60$ ($p < 0.001$) with national need for achievement, at $r = 0.20$ ($p < 0.35$) with national need for affiliation, and at $r = 0.31$ ($p < 0.14$) with national need for power. New findings from using asymmetric tests (fsQCA) enrich and deepen Lynn’s results; the new findings appear below.

3.3 Testing Additional Antecedents in Cultural Recipes

Along with reanalyzing the findings in prior studies by Lynn et al. (1993) and Lynn (2000) using asymmetric tests, the present study assesses the impact of more complex cultural wholes on tipping by testing the impacts of national religiosity (REL), gross domestic product by purchasing power parity (GDP), and the Gini index (GI). If the fourth tenet of complexity theory as described in this paper holds, none of these three culturally related conditions should be sufficient by themselves to indicate high or low tipping behavior across nations; however, each may be an ingredient in recipes that do so.

As conditions antecedent to tipping behavior, testable main effects include each having a positive main effect with tipping behavior. The world religions call for fair play and sharing of possessions with others. High versus low national wealth measured by GDP-PPP permits substantial ability for voluntary giving in the manner of tipping. Nations high in the Gini index have high shares of households with relatively high funds available for tipping behavior (e.g., among developed nations, the USA has a Gini index equal to 45 while Sweden’s Gini index equals 23 (CIA, 2014). The ratios of the incomes of the highest to lowest 10 percent of households in each country are 16 for the USA versus six for Sweden (HDR, 2009).

4 ANALYSIS

Configural or set theory methods such as qualitative comparative analysis (QCA) study the effect of configurations of conditions (recipes) on the outcome. These configurations represent a “recipe of causally relevant ingredients linked to an outcome” (Ragin, 2008a, p. 9). Using theory on intersections between sets, Ragin (2008a) argues that forces and events (conditions) intersect to cause outcomes and that this is consistent with much of the thinking in qualitative but not the quantitative research in the social sciences. Using Boolean algebra, this intersection is denoted by ‘logical and’ between the condition, and the score for a configuration is equal to the lowest value among the individual conditions in the configuration.

4.1 Calibration

Fuzzy-set theory (Zadeh, 1965) enables a case’s degree of membership in a set to be determined in fine gradations ranging from full non-membership (0.00) to full membership (1.00). This is achieved by calibrating the value for each case against a standard range of values that represent the accumulated knowledge about a set. The range of values that represent the set is determined by examining information on the entire set (Ragin 2008a) to identify the value that represents the threshold full non-membership (set at 0.05); the median as the point of “maximum membership ambiguity” (set at 0.50); and the threshold of full membership (set at 0.95). These three breakpoints represent an externally derived assessment of membership for the set and therefore permit calibration of cases into degrees of membership. Calibrating original scores into fuzzy-set scores can transform ordinal or interval scales into degree of membership in the target set. Ragin (2008b, p183, italics in original) refers to this as “a *truth value*” that reflects each case’s position in an established set rather than just positioning the cases relative to each other as is usual in social science. Calibrating the degree of membership of each case allows comparison

of each case against a known external standard that is consistent with existing theory about the set; and enables the identification of fine gradations in the degree of membership of a set. Ragin (2008a, p.8) argues that “all fuzzy sets must be calibrated” and that “it is impossible to conduct meaningful fuzzy set-theoretic analysis without attending to issues of calibration.”

Calibration was performed for all antecedent conditions and the outcome conditions (tipping behaviors) for the data in each of the three studies. For each condition, the median value was used for the crossover point of maximum ambiguity equal to 0.50; the threshold for full membership was equal to a score immediately below the highest original national scores for 5 to 10 percent of the countries in a study; the threshold for full non-membership was equal to a score immediately above the lowest original scores for 5 to 10 percent of the countries in a study. The calibration subroutine in the software program (at fsQCA.com) computed the scores for all countries once the three breakpoints were specified. For all conditions in all three studies, two to three different sets of breakpoints were set and findings examined; the findings did not indicate substantial differences across the use of different breakpoints.

The operating definitions of the antecedent and outcome conditions are shown in appendices A and B, respectively. Appendix C includes the original values and fuzzy-set calibration membership scores for the antecedent conditions for each nation and appendix D includes the same for the outcome conditions.

4.2 Consistency and Coverage

Consistency is a measure of the degree to which a specific recipe of conditions is consistent with the outcome. A high consistency score indicates that nearly all cases with a high membership score in the recipe of conditions would also have a high score in the outcome condition. Consistency occurs when a case's level of membership in the causal recipe is less

than or equal to its level of membership in the outcome (i.e. the causal recipe is a subset of the outcome) (Ragin, 2008a). The consistency score as calculated in the fsQCA software determines consistency ($\mathbf{Xi} \leq \mathbf{Yi}$), where \mathbf{Xi} is case i 's membership score in set \mathbf{X} ; \mathbf{Yi} is case i 's membership score in the outcome condition, \mathbf{Y} , by dividing the sum of the minimum of \mathbf{Xi} or \mathbf{Yi} by the sum of \mathbf{Xi} . Consistency ($\mathbf{Xi} \leq \mathbf{Yi}$) = $\Sigma \{\min(\mathbf{Xi}, \mathbf{Yi})\} / \Sigma(\mathbf{Xi})$. This approach penalises consistency scores for occurrences when \mathbf{Xi} exceeds \mathbf{Yi} in proportion to the size of the inconsistency.

The coverage index in fsQCA assesses the degree to which a causal configuration accounts for instances of an outcome. Set theory accommodates the idea that there are alternate causal recipes that lead to the outcome. QCA compares alternate paths by determining the proportion of cases that are consistent with a particular configuration (Ragin 2008a). If a configuration explains the outcome for a high proportion of cases then that configuration is considered more empirically important. Coverage should only be considered after consistency is established. To calculate coverage, the fsQCA software once again calculates the proportion of cases where degree of membership in the configuration is less than the membership in the outcome, but this time divides it by the total score for the outcome condition. This coverage calculation determines the level to which the causal recipe (the subset) covers the outcome (the larger set) (Ragin 2008a). Coverage ($\mathbf{Xi} \leq \mathbf{Yi}$) = $\Sigma \{\min(\mathbf{Xi}, \mathbf{Yi})\} / \Sigma(\mathbf{Yi})$. Ragin (2008a) provides a full description of QCA theory and method; the fsQCA software is available at www.fsQCA.com.

5 FINDINGS FOR STUDY 1

The analyses include testing the three expressed models predicting high-tipping frequency across industries as well testing for alternative algorithms (i.e., recipes) generated from the analysis subroutine in the software program at fsQCA.com. Keeping in mind the causal asymmetry tenet (T3) in complexity theory—in this study that the antecedent configurations for

not tipping behavior are unique in comparison to tipping—the usefulness of model 4 for predicting not tipping was examined as well as alternative models of not tipping.

5.1 Findings for the Four Models Predicting High-Tipping Frequency and the Model for High-Not-Tipping Frequency

The findings for the high tipping frequency models derived from Lynn et al. (1993) indicate that model 1, derived from Lynn et al.'s (1993) hypotheses, provides high consistency but low coverage (0.080); while model 2, derived from Lynn et al.'s (1993) results, is useful for predicting high scores in tipping frequency based upon both consistency and coverage (0.485). The consistency score is high for this model because eight countries have a high membership score (>0.75) in this model and have high tipping scores (>0.75). Model 3 has low consistency because there is no consistent pattern of high-tipping frequency among nations with high recipe scores for this model. Model 4 does provide high consistency (0.832) but only explains tipping behavior in France (coverage 0.121). Here are the specific findings for all five models:

Model	Consistency	Raw Coverage
$(PD \cdot \sim UA \cdot ID \cdot MA) \leq TF$	0.887	0.080
$(PD \cdot UA \cdot \sim ID \cdot MA) \leq TF$	0.893	0.485
$(PD \cdot UA \cdot ID \cdot MA) \leq TF$	0.684	0.151
$(PD \cdot UA \cdot ID \cdot \sim MA) \leq TF$	0.832	0.121
$(PD \cdot UA \cdot \sim ID \cdot MA) \leq \sim TF$	0.324	0.156

Model 5 represents the cultural configuration of Japan and is an attempt to explain not tipping behavior in Japan. Model 5 is mathematically the same as model 2, which adequately explains tipping behavior in eight countries (as discussed above). Therefore, the model does not

adequately explain (consistency 0.324) the negation of tipping frequency (\sim TF) in Japan but does predict *high-tipping frequency* in other countries with Japan being an exception to this finding!

Interestingly, other nations have higher calibrated scores than Japan scores on the Japanese cultural configuration model. The useful conclusion to draw is that the Japanese model is not very generalizable for not tipping behavior while the model is generalizable for tipping behavior. To resolve the seeming paradox, additional ingredients are necessary for explaining Japan's not tipping. As described below, additional findings support this conclusion.

5.2 Additional Useful Models for Tipping Behavior for Study 1

Using the fsQCA software, the recipes for four additional models support the general proposition that high scores on Hofstede's cultural value dimensions associate with high-tipping frequency. Table 1 describes the four additional models.

Table 1: High-Tipping Recipes Using Configurations of Hofstede's Dimensions Only

Sufficient Sets	Raw Coverage	Unique Coverage	Consistency
1. PD·UA· \sim MA	0.31	0.04	0.93
2. \sim PD·UA·MA	0.27	0.06	0.84
3. PD·UA· \sim ID	0.49	0.04	0.89
4. UA· \sim ID·MA	0.43	0.01	0.86

Note. " \sim " Indicates negation of attribute; mid-level dot, " \cdot " indicates the logical "AND" Boolean operation; total coverage 0.69; solution consistency 0.85.

From the perspective that uncertainty avoidance (UA) is an ingredient in all four models, UA is a necessary ingredient for high-tipping frequency. However, even though UA is an ingredient in all four recipes in Table 1 and Lynn et al. (1993) find a positive significant relationship between UA and tipping frequency, high UA alone is insufficient to predict high-tipping frequency. High UA associates with not tipping for two countries: Belgium and Japan. These findings support the fourth tenet of complexity theory: high scores for a simple

antecedent condition may be a necessary condition but rarely is sufficient for a high score for an outcome condition.

Examining the findings in Table 1, no other *carte blanche* statements about the directionality or usefulness of the other three cultural values are supportable. While high power distance (PD) is an ingredient associating with high-tipping frequency in models 1 and 3 in Table 1, the negation of PD is an ingredient associating with high-tipping frequency in model 2. PD is not an ingredient in model 4 in Table 1. This pattern of findings for PD supports the second tenet of complexity theory: For different cases, both high and low scores for the same simple antecedent condition (e.g., individualism) can appear in two different recipes whereby both associate with a high score in an outcome condition. Conclusion: Given these patterns of findings repeat for most ingredients across nearly all empirical tests of recipe models, blanket statements about main effects of independent variables on dependent variables have serious shortcomings and restrictive usefulness.

The negation of individualism (ID) is an ingredient in models 3 and 4 in Table 1; ID is not an ingredient in models 1 and 2. Thus, some collectivistic societies (i.e., high scores for the negation of ID) associate with high-tipping frequency but collectivism by itself is neither sufficient nor necessary for high-tipping frequency. Both high and low masculinity (MA) associates with high-tipping frequency—high MA is an ingredient in models 2 and 4 in Table 1 and low MA is an ingredient in model 1. These findings support the second tenet of complexity theory as well. The findings in Table 1 support T1, the equifinality tenet. Multiple recipes (sometimes referred to as paths or solutions) indicate high-tipping frequency. Cultures as “complex wholes” reflect a few paths to high frequency of a given behavior and many paths indicating no association or a negative association with the behavior.

The X-Y plots of the four models in Table 1 appear in Figures 1-4. Note that membership scores above 0.5 for nations in all complex antecedent conditions generally indicate high tipping frequencies (except Japan in figures 3 & 4). High scores in model 1 associate with high tipping for four Latin-based language countries plus Turkey. High scores in model 2 associate with high tipping for Argentina, Austria, Germany, and Italy. Membership scores above 0.5 in model 3 associate with high-tipping frequency for nine of 10 countries—the exception being Japan. Coverage (0.49) is quite high for model 3 because the model is representative of the majority of high tipping nations. Membership scores in model 4 associate with high-tipping frequency for seven countries and low tipping for Japan.

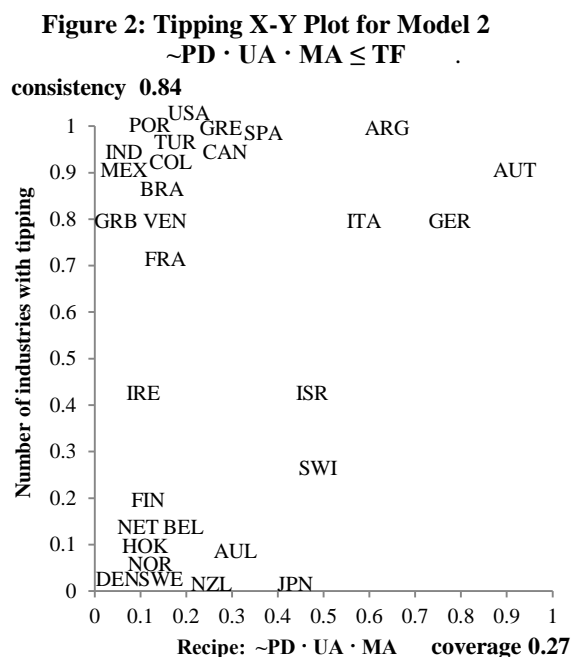
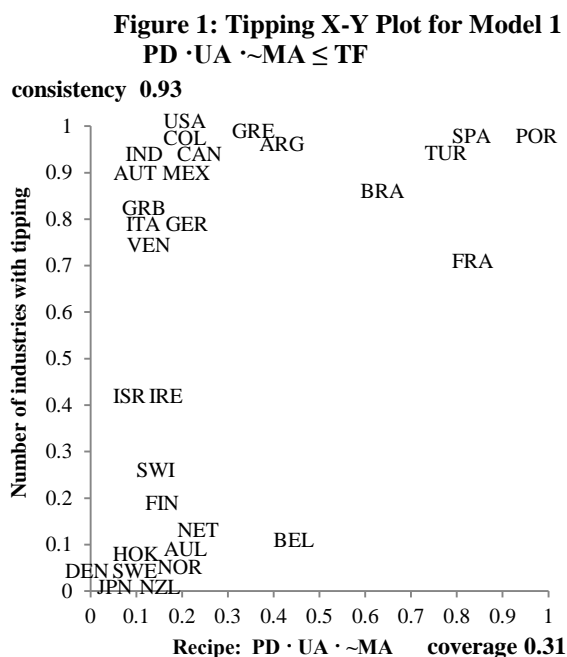


Figure 3: Tipping X-Y Plot for Model 3
 $PD \cdot UA \cdot \sim ID \leq TF$

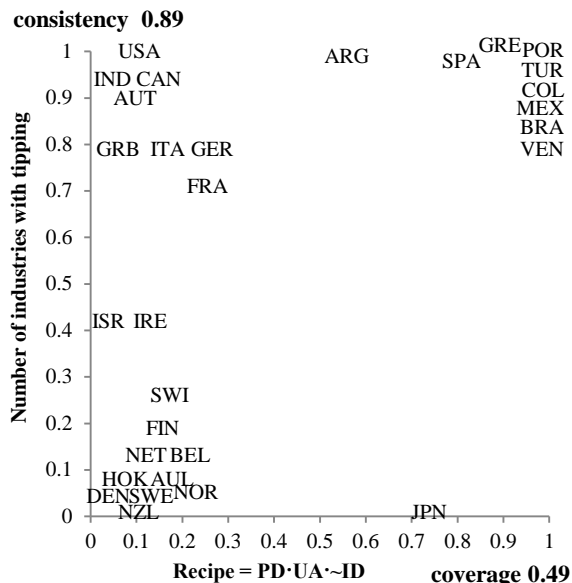
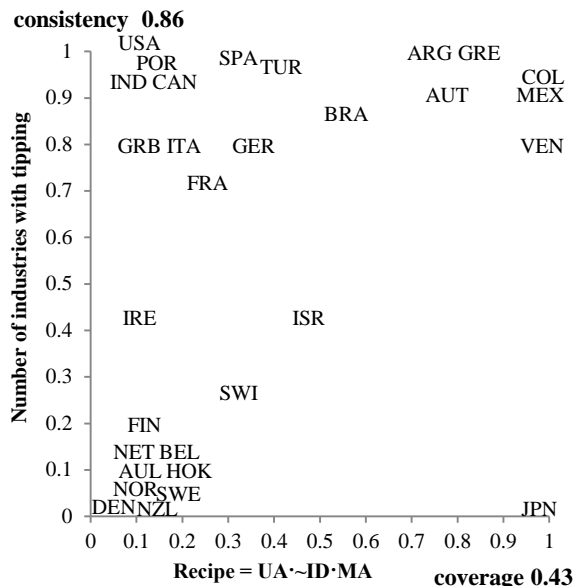


Figure 4: Tipping X-Y Plot for Model 4
 $UA \cdot \sim ID \cdot MA \leq TF$



While these X-Y plots explain tipping behavior for several countries they do not adequately explain high tipping frequencies for Canada and the USA. Thus, Hofstede's cultural values are not sufficient ingredients to explain tipping frequency for these nations. The research may benefit from considering additional antecedent conditions to assist in understanding how cultural complex wholes indicate high-tipping frequency for Canada and the USA.

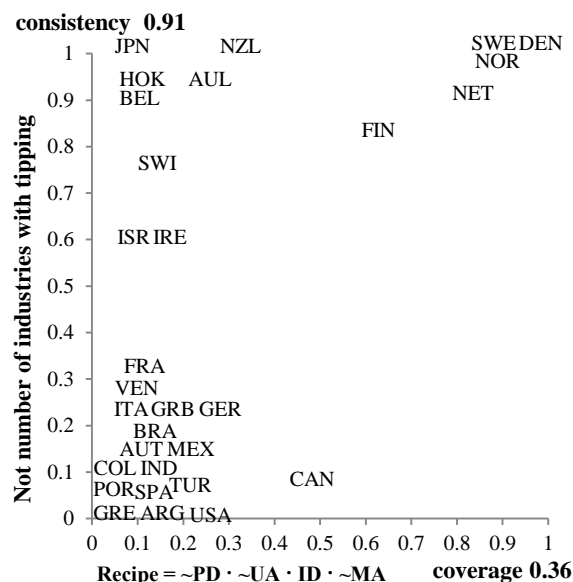
5.3 Models Predicting Not Tipping Frequency

One model derived from fsQCA software appears highly accurate in predicting the negation of tipping frequency ($\sim TF$):

$$(\sim PD \cdot \sim UA \cdot ID \cdot \sim MA) \leq \sim TF \quad (6)$$

The consistency of the findings for model 6 is equal to 0.91 and coverage equals 0.36. Details appear in Figure 5. Scores for this complex antecedent condition above 0.5 indicate high negation of tipping frequency for five countries; these countries include four Nordic countries and the Netherlands; no exceptions occur for this asymmetric relationship.

Figure 5: Not Tipping X-Y Plot for Model 5
 $\sim PD \cdot \sim UA \cdot ID \cdot \sim MA \leq TF$



Interestingly, model 6 is the mirror opposite of the proposed model for not tipping (i.e., model 5: $(PD \cdot UA \cdot \sim ID \cdot MA) \leq \sim TF$). Note that model 6 is not the mirror opposite of the four useful models for predicting high-tipping frequency in Table 1. Note that UA is a negative ingredient in not tipping frequency while it was a positive ingredient in all four models associated with positive tipping frequency. Negative ID appears in both model 3 and 4 in Table 1 as ingredients for high-tipping frequency and negative ID appears in model 6 for not tipping frequency. Such comparisons support T3, causal asymmetry: Unique configurations, not the mirror opposites of the configurations indicating high scores in an outcome condition, occur that indicate low scores for the outcome condition.

5.4 Do Additional Cultural Dimensions as Recipe Ingredients Improve Explanation?

The inclusion of the three additional culturally related dimensions in study 1 does improve the performances of the cultural recipes in predicting tipping frequency. Six models indicate high-tipping frequency; these six models appear in Table 2. In comparing the findings in Table 1 with Table 2, the overall increase in solution consistency is .07 (from 0.85 to 0.93)—

an increase of 46 percent of the increase possible to achieve. A decrease in overall coverage from 0.69 to 0.63 accompanies the increase in consistency—a common occurrence for very complex versus less complex recipes.

Table 2: High-Tipping Recipes Using Configurations of Hofstede Dimensions plus Gini, GDP, and Religiosity

	Sufficient Sets	Raw Coverage	Unique Coverage	Consistency
1	REL·GI85·~GDP85·PD·UA·~ID	0.42	0.12	0.97
2	REL·GI85·~GDP85·PD·~ID·MA	0.33	0.04	0.97
3	REL·GI85·~GDP85·UA·~ID·MA	0.33	0.01	0.97
4	REL·GI85·GDP85·~PD·UA·~ID·~MA	0.10	0.00	0.89
5	REL·~GI85·GDP85·PD·UA·~ID·MA	0.09	0.02	0.97
6	REL·GI85·GDP85·~PD·~UA·ID·MA	0.13	0.09	0.87

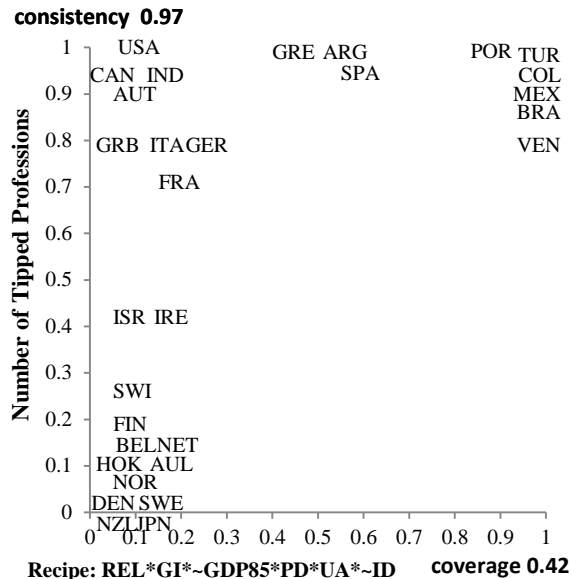
Note. “~” indicates negation of attribute; mid-level dot, “·” indicates the logical “AND” Boolean operation; total coverage 0.63; solution consistency 0.93.

In Table 2, religiosity is a positive ingredient in six of the six recipes. Religiosity alone has a highly significant symmetric relationship with tipping frequency ($r = 0.82$, $p < .001$). However, two nations (France and the UK) low in religiosity have high tipping frequencies and two nations (Ireland and Israel) relatively high in religiosity have modest levels of tipping frequencies.

While informative, the simple antecedent model for religiosity for explaining tipping frequency (consistency = 0.869; coverage = 0.841) is improvable by more complex antecedent conditions.

These more complex models appear in Table 2.

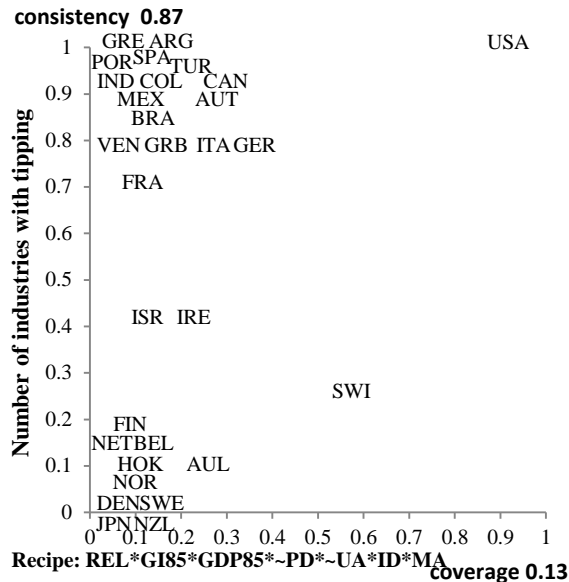
Figure 6: Tipping X-Y Plot for Model 1, Table 2
REL•GI85•~GDP85•PD•UA•~ID ≤ TF



Note in Table 2 that the negation of individualism (ID) appears in five of the six models. That ID is a positive contributing ingredient in cultural complex wholes to tipping frequency is a rare occurrence. Model 11 is the one model with ~ID as an ingredient; this model is the “American model” of ~PD•~UA•ID•MA in combination with high religiosity, high Gini, and high GDP. The American model is the model the USA scores highest as an outcome condition using Hofstede’s four cultural values. The USA is the single country that one model with all seven ingredients represents; Figure 6 shows the details.

In Table 2, note that model 6 provides both relatively high coverage (0.42) and high consistency (0.97). Figure 7 shows that model 6 includes nine countries with high-tipping scores when the membership score for this complex antecedent condition is above 0.40. The nine countries are Latin-language-base countries plus Greece and Turkey.

Figure 7: Tipping X-Y Plot for Model 6, Table 2
REL·GI85·~GDP85·PD·UA·~ID ≤ TF



5.5 Additional Dimensions and the Negation of Tipping Frequency

Table 3 reports the recipes including Hofstede's four cultural value dimensions plus the three additional culturally related dimensions that are useful for predicting the negation of tipping frequency. In Table 3, note that model 3 includes religiosity as an ingredient in this recipe. A rather surprising finding! Even though positive religiosity has a highly significant symmetric relationship with tipping frequency, model 3 show a complex antecedent recipe that includes positive religiosity for the negation of tipping frequency. Thus, analysis by recipes provides nuances that analyses by symmetric tests frequently overlook. These findings provide additional support for the third tenet of complexity theory; T3, causal asymmetry: The same simple antecedent condition can appear in both positive and negative versions of the same outcome condition; the recipes indicating the negation of an outcome condition are not the mirror opposites of the recipes indicating a positive response for the same outcome condition. However, the X-Y plot for model 3 does not indicate much in the way of practical insights—with seven ingredients in the model, a high score on model 3 (the X axis is 0.20) and the highest score

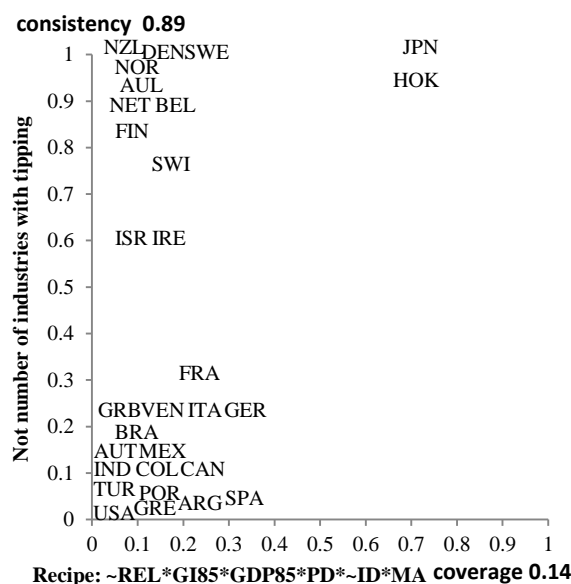
for this model and not tipping is for New Zealand. New Zealand is not a country high in religiosity. Consequently, very complex configuration models that appear to be useful according to the consistency metric may be of limited usefulness. This analysis of model 3 indicates the value of examining X-Y plots of complex configurational models especially when they are very complex.

Table 3: Not Tipping Recipes using Hofstede Cultural Values plus Religiosity, Gini, & GDP

Sufficient Models	Raw Coverage	Unique Coverage	Consistency
1 ~REL·GI85·GDP85·PD·~ID·MA	0.14	0.09	0.89
2 ~REL·~GI85·GDP85·~PD·~UA·ID·~MA	0.35	0.29	0.92
3 REL·~GI85·~GDP85·~PD·~UA·ID·MA	0.11	0.05	0.96
4 ~REL·~GI85·GDP85·PD·UA·ID·MA	0.12	0.06	0.84

Notes. “~” indicates attribute negation; “·” indicates the logical AND Boolean operation. Total coverage = 0.58 solution consistency = 0.92.

Figure 8: Not Tipping X-Y Plot for Model 1, Table 3
~REL·GI85·GDP85·PD·~ID·MA ≤ TF



Model 1 is a recipe that helps to explain Japan’s negative behavior toward tipping.

Figure 8 shows the findings for Model 1. Model 1 is a highly complex recipe that includes the negation of religiosity, high Gini index, and high GDP along with power distance, masculinity, and the negation of individualism. Two countries score high on this recipe (i.e., Hong Kong and

Japan) and both score high on the negation of tipping frequency. The negation of religiosity in combination with high PD and MA appears to represent substantial negative energy toward tipping frequency; an additional asymmetric test confirms this proposal. Three countries score high on this recipe (Belgium, Hong Kong, and Japan) and all three countries score high on the negation of tipping frequency. The consistency for this three-ingredient model equals 0.889 and the coverage equals 0.229.

6 FINDINGS FOR STUDY 2:

MCCLELLAND'S PSYCHOLOGICAL MOTIVES AND TIPPING FREQUENCY

In Lynn's (2000) symmetric analysis of the influence of nAch, nAff, and nPow on the number of tipping professions, he reports the following findings after eliminating two (Brazil and New Zealand) of 27 nations as statistical outliers. The number of tipped professions correlated at $r = 0.60$ ($p < 0.001$) with national need for achievement, at $r = 0.20$ ($p < 0.35$) with national need for affiliation, and at $r = 0.31$ ($p < 0.14$) with national need for power.

A simultaneous multiple regression of the number of tipped professions on national need for achievement, need for affiliation, and need for power in this sample produced a model $R^2 0.40$ ($F(3, 21) = 6.24, p < 0.003$). The findings includes significant regression coefficients for national need for achievement ($b = 0.64, t(21) = 3.77, p < 0.001$) and need for power ($b = 0.34, t(21) = 2.09, p < (0.05)$). The regression coefficient for national need for affiliation was not significant ($b = 0.09, t(21) = 0.54, p < 0.60$).

(Lynn, 2000, p. 209)

These findings support the basic conclusion that nAch alone has an influence on tipping frequency. A stepwise regression model (done in the present study) indicates that only nAch enters as a significant influence on tipping frequency.

6.1 Asymmetric Tests Findings for Tipping Frequency Using McClelland's Motives

However, applying asymmetric focus and analyses to the national data available provides a more nuanced perspective of the influence of three motives on tipping frequency. The asymmetric focus on predicting high tipping frequency alone does not show high nAch calibrated scores alone to be insufficient for explaining high tipping frequency. The consistency index for nAch alone is 0.769 and four nations (Australia, France, Ireland, and Israel) with high nAch have relatively low tipping frequencies.

However, the configuration of nAch•nPow provides high consistency (0.896) with coverage equal to 0.440 and all countries with membership scores above 0.5 on this model have high tipping scores (> 0.75). The X-Y plot for this model appears as Figure 9. These findings indicate that two of McClelland's psychological motives identify high-tipping frequency for the USA better than Hofstede's four cultural values. Adding the three additional culturally related antecedents (religiosity, GDP, and the Gini index) results in 5 improves consistency to 0.976 while lowering coverage to 0.318; details appear in Figure 10.

Figure 9: Tipping X-Y Plot for McClelland's Motives
 $nPow \cdot nAch \leq TF$

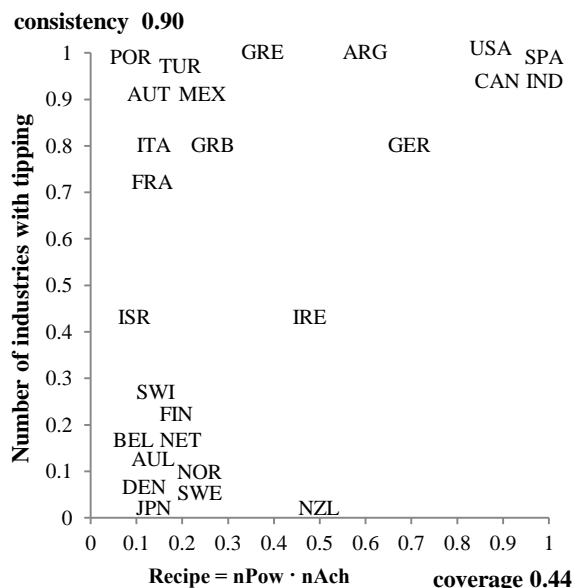
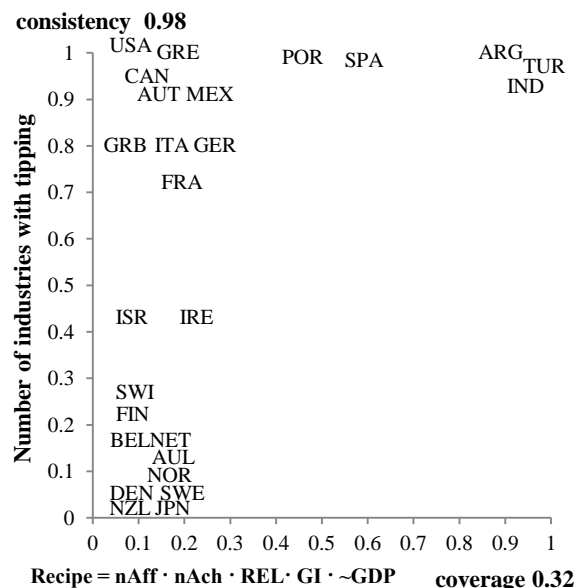


Figure 10: Tipping X-Y Plot for McClelland's Motives plus religiosity, GDP and Gini
 $nAff \cdot nAch \cdot \sim REL \cdot GI85 \cdot GDP85 \leq TF$



These findings support the fourth complexity tenet. T4: high scores for a simple antecedent condition may be a necessary condition but the simple condition is rarely sufficient for a high score for an outcome condition. While the relationship between nAch and tipping frequency is highly significant statistically in the symmetric correlation test, knowing that a country has a high nAch score is not sufficient for concluding that this country has a high tipping score. Additional cultural information in a complex recipe that includes nAch and four additional antecedents does provide such assurance.

6.2 Asymmetric Tests Findings for Not Tipping Frequency Using McClelland's Motives

Table 4 presents the asymmetric models indicating not tipping behavior. Particularly noteworthy is the finding in Part A that all three motives contribute to achieving accuracy in predicting high scores on not tipping frequency. Also, while high nAch is insufficient for accurately predicting high scores in tipping frequency, high $\sim nAch$ is likewise insufficient for

accurately predicting high scores in not tipping frequency (consistency is 0.688 and coverage is 0.747 for $\sim nAch$ and not tipping frequency).

Table 4: McClelland's Psychological Motives only and with Additional Cultural Related Antecedents Predicting Not Tipping Frequency

Part A: Predicting Not Tipping with McClelland's Motives Only			
Sufficient Models	Raw Coverage	Unique Coverage	Consistency
1	$nPow \cdot nAch \cdot nAff$	0.25	0.80
2	$\sim nPow \cdot \sim nAch \cdot nAff$	0.42	0.85
Notes. " \sim " indicates attribute negation; " \cdot " indicates the logical AND Boolean operation. Total coverage = 0.51 solution consistency = 0.80.			
Part B: Predicting Not Tipping with McClelland's Motives and Additional Cultural Antecedents			
Sufficient Models	Raw Coverage	Unique Coverage	Consistency
	$\sim nAch \cdot \sim GI11 \cdot \sim REL \cdot GDP13$	0.61	0.94
	$\sim nAff \cdot \sim nAch \cdot \sim nPow \cdot \sim REL \cdot GDP13$	0.26	0.98
	$\sim nPow \cdot \sim nAff \cdot nAch \cdot REL \cdot \sim GI11 \cdot \sim GDP13$	0.10	0.87
Notes. " \sim " indicates attribute negation; " \cdot " indicates the logical AND Boolean operation. Total coverage = 0.70 solution consistency = 0.93.			

Part B presents the cultural recipes of configurations include one to three psychological motives and two to three additional antecedents that accurately predict not tipping frequency. Interestingly religiosity is an ingredient in the first two of these models and the negation of religiosity is in the third model. This finding supports the third complexity tenet. T3, causal asymmetry: The same simple antecedent condition can appear in both positive and negative versions of the same outcome condition, and more generally, the recipes indicating the negation of an outcome condition are not the mirror opposites of the recipes indicating a positive response for the same outcome condition.

7 CONTRIBUTIONS TO THEORY, LIMITATIONS, AND FUTURE RESEARCH

7.1 Contributions to Theory

Working from the perspective that national cultures represent complex wholes, the current study advances theory and research on how complex cultural recipes are likely to associate with specific consumer behaviors. By building on core tenets of complexity theory

(Urry, 2005; Waldrop, 1992) and examining recipes of asymmetric relationships without and with the combination influences of additional culturally-related antecedents, the two studies here extend the prior symmetric theory and positivistic studies of Lynn et al. (1993) and Lynn (2000).

Including the additional culturally related ingredients (religiosity, GDP, and the Gini index fuzzy-set membership scores) into recipes of Hofstede's cultural values does increase the accuracy of models indicating high tipping frequency as well as models indicating the negative of tipping frequency. Along with cultural values, all three additional ingredients appear as ingredients in all models highly accurate in predicting high tipping frequencies (Table 2). Recipe model 11 in Table 2 cracks the cultural code (cf. Levi-Strauss, 1995) in predicting high tipping frequency in the USA (Figure 6); model 11 describes a nation relatively high across scores for religiosity, the Gini index, GDP, AND the USA cultural model ($\sim PD \cdot \sim UA \cdot ID \cdot MA$).

A recipe that includes six ingredients helps to explain not tipping frequency in Japan. The recipe, model 12, includes $\sim REL \cdot GI85 \cdot GDP85 \cdot PD \cdot \sim ID \cdot MA$. Note that this not-tipping frequency model includes some of the same ingredients as the tipping frequency model for the USA but clearly, both models are unique.

The findings support the usefulness of one recipe of McClelland's (1961) core psychological motives for predicting tipping frequency: $nPow \cdot nAch$. Fuzzy membership scores above 0.5 indicate all such nations have high tipping frequencies (Figure 9). Including the additional three culturally related ingredients along with the negation of $nAff \cdot nAch$ indicates high tipping frequency as well (Figure 10). Models using McClelland's motives without and with the three additional culturally related ingredients are useful as well for predicting not tipping frequency (Table 4). The presence of $nAch$ in both offers credence to a core tenet of

complexity theory: The same ingredient may support tipping frequency and support not-tipping frequency--which depends upon the presence of alternative ingredients in two or more recipes.

This report transcends the current dominant theory and tools of most prior cultural impact studies. The current dominant logic focuses on reporting whether or not potential independent variables influence culturally related outcomes net of possible effects of other potential independent variables. Such studies are not examinations of cultures as complex wholes (Tylor, 1871/1920). The dominant logic studies apply symmetric thinking and testing, require too much, and recognize too little about the relationships among separate conditions (i.e., “variables” in symmetric thinking). McClelland (1998) shows that relationships of interest of variables associating with a given outcome (job success in his study) are not described well by correlation and regression analysis and he creates algorithms that do so; Ordanini et al. (2014) do the same in their study of antecedent configurations of consumer adoption of innovations. McClelland’s study identifies cases having a combination of high scores on a few antecedent conditions—algorithms—that predict high job success accurately. Except for Gigerenzer and colleagues (1996, 1999, 2003, 2011) and Ragin (2000, 2008, 2009), and though McClelland’s body of work is cited widely (e.g., his 1998 article has 619 citations as of August 29, 2010 at [Google.com/scholar](https://www.google.com/scholar)), theory constructing and testing by algorithms in the behavioral sciences were ignored widely in the first decade of the 21st century. The second decade of the 21st century includes an emerging stream of theory and post-positivistic research using asymmetric thinking and data analysis (Fiss, 2007, 2011, Fiss, Cambré, Marx, 2013; Meier & Donzé, 2012; Ordanini et al., 2014; Woodside, 2010, 2013,2014; Wu et al., 2014).

7.2 Limitations and Suggestions for Future Research

The focus strictly on macro national levels of antecedent conditions is one limitation of the present study. The study here as the two studies by Lynn et al. (1993) and Lynn (2000) do not examine representative samples of individuals across national cultures for the antecedent conditions. The examinations of influences on tipping frequency among individuals high and low on Hofstede values, McClelland's motives, and additional culturally-related antecedents in nations high and low on these values and motives are worthy of additional study.

Examining only limited numbers of antecedent conditions is a second limitation of this report and Lynn's prior reports. Certainly, the study of complete cultural complex wholes is impossible. Theory, prior research reports, and insight guide the selections of antecedent conditions for inclusion in cultural recipes that may affect consumer behavior outcomes of interest. The degree of subcultural variance within national cultures may relate to tipping behaviors in consistent ways. Finland and Japan are nations very low in varieties while the UK and the USA are relatively high in varieties of subculture membership. Does such an ingredient as variety of subculture membership assist in identify high and low outcomes of tipping behaviors? Such an issue is worth answering in future research.

Not testing for predictive validity is a third limitation in the present study by most behavioral research studies using symmetric tests. Armstrong (1967), Gigerenzer and Brighton (2009), McClelland (1998), and Roberts and Pashler (2000) all point out the severe shortcomings of relying on fit estimates only for the usefulness of any and all forecasting models. The use of separate samples of cases (such as holdout samples) is necessary for testing the accuracy of prediction models. Roberts and Pashler (2000) estimate that, in psychology alone, the number of articles relying on a good fit as the only indication of a good model runs into the thousands.

McClelland (1998) and Gigerenzer and Brighton (2009) take great care in comparing the predictive abilities of alternative symmetric and asymmetric tests in predicting outcomes of interest.

Table 9: High-Tipping Frequency Recipes Using Configurations of Hofstede's Dimensions Only for Each Sample

A: Sample One				
	Sufficient Models	Raw Coverage	Unique Coverage	Consistency
1	UA·~ID	0.52	0.12	0.93
2	PD·UA·~MA	0.31	0.06	0.96
3	PD·~ID·MA	0.33	0.07	1.00
4	~PD·UA·MA	0.31	0.09	0.90
Notes. “~” indicates attribute negation; “·” indicates the logical AND Boolean operation. Total coverage = 0.76 solution consistency = 0.90.				
B: Sample 2				
	Sufficient Models	Raw Coverage	Unique Coverage	Consistency
1	PD·UA·~ID·~MA	0.29	0.29	0.98
Notes. “~” indicates attribute negation; “·” indicates the logical AND Boolean operation. Total coverage = 0.29 solution consistency = 0.98.				

Here is an early response to this call for testing for predictive accuracy and using Hofstede's four cultural values. Table 9 presents the findings for splitting the sample of 30 firms into two subsamples and examining the relevant useful models in each subsample for predicting high tipping frequency in the other sets of models. A random assignment was made of the 30 firms. Cross validation of the models indicates that the model in sample two attains a coverage of 0.234 and consistency of 1.00 in sample one, and that the closest model in sample one ($PD \cdot UA \cdot \sim MA \leq TF$) attains a coverage of 0.305 and consistency of 0.863 in sample two. Therefore, the models are relatively accurate in predicting high tipping frequency--one for each subsample. These findings provide reasonable support for the conclusion that the recipe models of tipping frequency are not only useful from a fit validity perspective will also have high predictive validity. Future research should include findings for predictive validity as well as fit validity as McClelland (1998) and Gigerenzer and Brighton (2009) urge.

8 CONCLUSION

Although the consumer research literature includes explorations of culture as a driver of tipping behavior, prior studies do not capture the complexity of the phenomenon adequately; prior studies acknowledge the complexity of the phenomena but then deconstruct the complex whole to report the net effect of each ingredient. The current study builds on the symmetric and positivistic findings of Lynn et al. (1993) and Lynn (2000) and extends theory by identifying recipes of cultural dimensions; the different recipes explain tipping behavior and the negation of tipping behavior. The study demonstrates that sets of complex cultural ingredients contribute in different ways to tipping behavior depending on the particular ingredients in each recipe; multiple recipes occur that explain tipping behavior; antecedents' recipes indicating tipping and the negation of tipping behavior form asymmetric relationships. The paper contributes substantively to the understanding of differences in tipping behavior across countries and extends deconstructed research methods commonly used to explore complex phenomena in consumer behavior.

APPENDIX A

Table A1: Definitions of Antecedent Conditions

Condition	Description	Source
Hofstede's Cultural Dimensions	As per Lynn et al. (1993) Hofstede's Cross-country cultural dimensions (1980) - power distance, uncertainty avoidance, masculinity and individualism - were used in the current study.	Hofstede (1980)
McClelland's Dimensions	McClelland derived motivation scores for need for achievement, need for affiliation and need for power from 21 children's stories from each country. McClelland (1961) detected some coding bias for the Brazil data and did not use it - therefore it was not used in the current study.	McClelland (1961)
GDP85	Gross Domestic Product per capita based upon purchasing power parity (PPP). The PPP method eliminates the effects of differences and changes in relative price levels, and therefore provides a better comparison of GDP between countries. Values appear in USDs. As the available data for each country varies--the earliest data available are used for some countries.	International Monetary Fund (2014)
GDP13	Gross Domestic Product per capita based upon purchasing power parity (PPP). Values appear in USDs. The values used are the latest data available at July 2014.	International Monetary Fund (2014)
GI85	The Gini coefficient measures the extent to which the distribution of income or consumption expenditure among individuals within an economy deviates from an equal distribution.	The World Bank Gini Index (2014)
GI11	Most recent Gini coefficient data accessed from The World Bank as at July 2014.	The World Bank Gini Index (2014)
Religiosity	Percentage of respondents who answered yes, to "Religion is important to me" in WIN-Gallup International (2009) Worldview of Religion.	WIN-Gallup International (2009)

APPENDIX B

Table B1: Definitions of Outcome Conditions

Condition	Definition	Source
Tipping Frequency	This condition refers to the number of industries where tipping is expected in each country. Star (1988) collected data on 38 professions in 34 countries by surveying the tourism operators within each country. Each profession was coded as tipped or not tipped.	Sourced from Lynn et al. (1993) who used data from 33 professions across 30 countries (originally sourced from Star 1988)

APPENDIX C

Table C1: Calibration for Antecedent Conditions

Country	MA	MA_c	ID	ID_c	PD	PD_c	UA	UA_c	nAch	nAch_c	nAff	nAff_c	nPow	nPow_c
ARG	56	0.71	46	0.11	49	0.46	86	0.98	3.38	1.00	1.29	0.09	0.95	0.50
AUL	61	0.84	90	0.99	36	0.11	51	0.21	2.38	0.94	1.24	0.06	0.52	0.05
AUT	79	0.99	55	0.32	11	0.00	70	0.82	1.86	0.29	1.14	0.03	0.43	0.03
BEL	54	0.65	75	0.90	65	0.90	94	0.99	0.43	0.00	1.52	0.35	0.95	0.50
BRA	49	0.46	38	0.04	69	0.95	76	0.92						
CAN	52	0.57	80	0.95	39	0.16	48	0.14	2.29	0.87	2.19	0.96	1.24	0.95
COL	64	0.89	13	0.00	67	0.93	80	0.95						
DEN	16	0.01	74	0.89	18	0.01	23	0.00	1.05	0.02	1.76	0.71	0.86	0.35
FIN	26	0.03	63	0.61	33	0.07	59	0.46	1.52	0.10	1.71	0.65	1.05	0.73
FRA	43	0.26	71	0.84	68	0.94	86	0.98	2.38	0.94	1.19	0.04	0.48	0.04
GER	66	0.92	67	0.74	35	0.10	65	0.68	2.14	0.60	1.29	0.09	1.33	0.98

GRB	66	0.92	89	0.99	35	0.10	35	0.02	1.67	0.17	2.54	0.99	1.10	0.82
GRE	57	0.74	35	0.02	60	0.82	112	1.00	2.29	0.87	2.14	0.95	0.81	0.28
HOK	57	0.74	25	0.01	68	0.94	29	0.01						
IND	56	0.71	48	0.14	77	0.98	40	0.05	2.71	1.00	1.24	0.06	1.24	0.95
IRE	68	0.94	70	0.82	28	0.04	35	0.02	2.29	0.87	1.38	0.16	0.90	0.42
ISR	47	0.39	54	0.29	13	0.00	81	0.96	2.33	0.91	2.90	1.00	0.19	0.01
ITA	70	0.95	76	0.92	50	0.50	75	0.90	1.33	0.05	2.00	0.90	0.95	0.50
JPN	95	1.00	46	0.11	54	0.65	92	0.99	1.29	0.05	2.19	0.96	0.95	0.50
MEX	69	0.95	30	0.01	81	0.99	82	0.96	1.57	0.12	1.62	0.53	1.19	0.92
NET	14	0.00	80	0.95	38	0.14	53	0.26	1.48	0.09	2.19	0.96	0.71	0.17
NOR	8	0.00	69	0.79	31	0.05	50	0.18	1.71	0.19	1.95	0.87	0.57	0.07
NZL	58	0.77	79	0.95	22	0.01	49	0.16	2.05	0.45	1.33	0.12	1.90	1.00
POR	31	0.05	27	0.01	63	0.88	104	1.00	2.10	0.50	1.67	0.59	0.48	0.04
SPA	42	0.23	51	0.21	57	0.74	86	0.98	2.33	0.91	0.62	0.00	1.86	1.00
SWE	5	0.00	71	0.84	31	0.05	29	0.01	1.62	0.14	1.48	0.29	0.76	0.22
SWI	70	0.95	68	0.77	34	0.08	58	0.43	1.71	0.19	1.52	0.35	0.52	0.05
TUR	45	0.32	37	0.03	66	0.92	85	0.98	3.62	1.00	0.90	0.01	0.62	0.10
USA	62	0.86	91	0.99	40	0.18	46	0.11	2.24	0.80	2.05	0.92	1.38	0.99
VEN	73	0.97	12	0.00	81	0.99	76	0.92						

Table C1 (ctd): Calibration for Antecedent Conditions

Country	GDP85	GDP85_c	GI85	GI85_c	GDP13	GDP13_c	GI11	GI11_c	REL	REL_c
ARG	5270	0.06	42	0.99	18749	0.05	44.5	0.99	66	0.95
AUL	13916	0.91	31	0.35	43073	0.92	30.5	0.18	32	0.16
AUT	14414	0.93	32	0.50	42597	0.91	26	0.03	55	0.83
BEL	13629	0.90	26	0.03	37881	0.70	33	0.39	33	0.18
BRA	4518	0.04	56	1.00	12221	0.02	54.7	1.00	86.5	1.00
CAN	16211	0.98	29	0.14	43472	0.93	32.6	0.35	42	0.50
COL	3280	0.02	56	1.00	11189	0.01	55.9	1.00	82.5	0.99
DEN	14958	0.95	22	0.00	37900	0.70	24	0.01	18	0.02
FIN	12506	0.82	21	0.00	35617	0.55	26.9	0.05	28	0.09
FRA	13677	0.90	29	0.14	35784	0.56	32.7	0.36	29.5	0.11
GER	13798	0.91	30	0.23	40007	0.82	28.3	0.08	40.5	0.44
GRB	11468	0.71	34	0.73	37307	0.67	34	0.50	26.5	0.07
GRE	10825	0.62	31	0.35	24012	0.13	34.3	0.53	71.5	0.97
HOK	10735	0.61	43	1.00	52722	1.00	53.3	1.00	23	0.04
IND	643	0.00	40	0.98	4077	0.00	33.4	0.44	79	0.99
IRE	8990	0.35	29	0.14	39547	0.80	34.3	0.53	53.5	0.80
ISR	10582	0.59	37	0.92	34770	0.49	39.2	0.90	49.5	0.71
ITA	12723	0.84	34	0.73	30289	0.30	36	0.70	71.5	0.97
JPN	13235	0.87	33	0.62	36899	0.64	38.1	0.85	23.5	0.04
MEX	6633	0.12	48	1.00	15563	0.03	47	1.00	72	0.97
NET	14255	0.93	27	0.05	41711	0.88	30.9	0.21	24.5	0.05
NOR	18934	1.00	29	0.14	54947	1.00	25.8	0.03	20.5	0.03
NZL	11718	0.74	25	0.01	30493	0.31	36.2	0.72	33	0.18
POR	7185	0.16	35	0.82	23068	0.11	38.5	0.87	71.5	0.97

SPA	9842	0.48	32	0.50	29851	0.29	34.7	0.57	49.5	0.71
SWE	13955	0.91	26	0.03	41188	0.86	25	0.02	16.5	0.01
SWI	19374	1.00	36	0.88	46430	0.97	33.7	0.47	41.5	0.48
TUR	3875	0.02	41	0.99	15353	0.03	39	0.89	89.5	1.00
USA	18232	0.99	38	0.95	53101	1.00	45	0.99	65	0.94
VEN	6291	0.10	38	0.95	13605	0.02	44.8	0.99	79	0.99

REFERENCES

- Armstrong, J. S. (1967). The derivation of theory by means of factor analysis or Tom Swift and electric factor analysis machine. *American Statistician*, 21, 17-21.
- Byrne, D. S. & Callaghan, G. (2013). *Complexity theory and the social sciences: The state of the art*. London: Routledge.
- CIA (2014). Distribution of family income—Gini index, *The World Factbook*, Washington, DC: Central Intelligence Agency (accessed August 25, 2014).
- Cohen, J. (1977). *Statistical Power Analysis for the Behavioral Sciences*. New York: Academic.
- Cure, K., Klurman, M., & Lombardi, M. (Eds.). (2002). *How to Tip*. New York: Fodor's Travel.
- Fiss, P. C. (2007). A set-theoretic approach to organizational configurations. *Academy of management review*, 32(4), 1180-1198.
- Fiss, P. C. (2011). Building better causal theories: A fuzzy set approach to typologies in organization research. *Academy of Management Journal*, 54(2), 393-420.
- Fiss, P. C., Cambré, B., & Marx, A. (Eds.). (2013). *Research in the Sociology of organizations. In Configurational Theory and Methods in Organizational Research*. Emerald Group Publishing Limited.
- Gallup-WIN (2009) *Worldview of Religion*
<http://www.wingia.com/web/files/news/14/file/14.pdf> Access July 2014
- Gigerenzer, G. (1991). How to make cognitive illusions disappear: Beyond “heuristics and biases”. *European review of social psychology*, 2(1), 83-115.
- Gigerenzer, G. (2003). *Reckoning with risk: learning to live with uncertainty*. Penguin UK.
- Gigerenzer, G., & Brighton, H. (2009). Homo heuristicus: Why biased minds make better inferences. *Topics in Cognitive Science*, 1(1), 107-143.
- Gigerenzer, G., & Goldstein, D. G. (1996). Reasoning the fast and frugal way: models of bounded rationality. *Psychological review*, 103(4), 650.
- Gigerenzer, G., Hertwig, R., & Pachur, T. (2011). *Heuristics: The foundations of adaptive behavior*. Oxford University Press, Inc.
- Gigerenzer, G., & Todd, P. M. (1999). *Simple heuristics that make us smart*. Oxford University Press.
- Gladwell, M. (2002). *Tipping points: How little things can make a big difference*. Boston, MA: Little, Brown.
- Greckhamer, T., Koro-Ljungberg, M., Cilesiz, S., & Hayes, S. (2008). Demystifying interdisciplinary qualitative research. *Qualitative Inquiry*, 14(2), 307-331.
- Gummesson, E. (2008). Extending the service-dominant logic: From customer centricity to balanced centricity. *Journal of the Academy of Marketing Science*, 36, 15–17.
- Hofstede, G. (1980). *Culture's Consequences. International Differences in Work-related Values*, Beverly Hills, CA: Sage.
- HDR (2009). *Human Development Report 2009, United Nations Development Program* (accessed on August 25, 2014).
- International Monetary Fund (2014) *World Economic Outlook Database*, April 2014
<http://www.imf.org/external/pubs/ft/weo/2014/01/weodata/weoselgr.aspx> Accessed July 2014.
- Lazarsfeld, P. F. (1937). Some remarks on the typological procedures in social research. *Festschrift fur Sozialforschung*, 6(1), 119–139.
- Levi-Strauss, C. (1995). *Myth and Meaning: Cracking the Code of Culture*. New York: Schocken Books.

- Lynn, M. (2000). National character and tipping customs: the needs for achievement, affiliation and power as predictors of the prevalence of tipping. *International Journal of Hospitality Management*, 19(2), 205-210.
- Lynn, M., Zinkhan, G. M., & Harris, J. (1993). Consumer tipping: a cross-country study. *Journal of Consumer Research*, 478-488.
- McClelland, D. C., (1961). *The Achieving Society*. Free Press, New York.
- McClelland, D. C. (1998). Identifying competencies with behavioral-event interviews. *Psychological Science*, 9(5), 331-339.
- Meier, A., & Donzé, L. (2012). *Applying Fuzzy Logic and Fuzzy Methods to Marketing. Fuzzy Methods for Customer Relationship Management and Marketing: Applications and Classifications*, 1-15.
- Ordanini, A., Parasuraman, A., & Rubera, G. (2014). When the recipe is more important than the ingredients: A qualitative comparative analysis (QCA) of service innovation configurations. *Journal of Service Research*, 17, 134–149.
- Putzi, S. (Ed.). (2002). *Global Road Warrior (Version 3.0)*. Novato, CA: World Trade Press
- Ragin, C. C. (2000). *Fuzzy-Set Social Science*. University of Chicago Press.
- Ragin, C. C. (2006). Set relations in social research: Evaluating their consistency and coverage. *Political Analysis*, 14(3), 291-310.
- Ragin, C. C. (2008a). *Redesigning Social Inquiry: Fuzzy Sets and Beyond*. Chicago, IL: Chicago University Press.
- Ragin, C. C. (2008b). *The Oxford Handbook of Political Methodology*. Oxford, UK: Oxford University Press, 174–198.
- Ragin, C. C. (2009). Qualitative comparative analysis using fuzzy sets (fsQCA). *Configurational Comparative Methods*, 87-121.
- Ragin, C. C., Shulman, D., & Weinberg, A. (2003). Complexity, generality, and qualitative comparative analysis. *Field Methods*, 15, 323–340.
- Rushton, J. P., Brainerd, C. J., & Pressley, M. (1983). Behavioral development and construct validity: The principle of aggregation. *Psychological Bulletin*, 94(1), 18-38.
- Roberts, S., & Pashler, H. (2000). How persuasive is a good fit? A comment on theory testing. *Psychological Review*, 107, 358–367.
- Samaha, S. A., Beck, J. T., & Palmatier, R. W. (2014). The Role of Culture in International Relationship Marketing. *Journal of Marketing*, 78 (September), 78-98.
- Star, N. (1988), *The International Guide to Tipping*. New York: Berkeley.
- The World Bank Gini index.
http://data.worldbank.org/indicator/SI.POV.GINI?page=4&order=wbapi_data_value_2011%20wbapi_data_value&sort=asc Accessed July 2014
- Tylor, E. (1871/1920). *Primitive Culture*, 1. New York: J. P. Putnam's Sons.
- Urry, J. (2005). The complexity turn. *Theory, Culture & Society*, 22, 1–14.
- Waldrop, M. M. (1992). *Complexity: The Emerging Science at the Edge of Chaos*. New York: Simon & Schuster.
- Woodside, A. G. (2010). *Case Study Research: Theory, Methods and Practice*. Emerald Group Publishing.
- Woodside, A. G. (2013). Moving beyond multiple regression analysis to algorithms: Calling for adoption of a paradigm shift from symmetric to asymmetric thinking in data analysis and crafting theory. *Journal of Business Research*, 66(4), 463-472.

- Woodside, A. G. (2014). Embrace• perform• model: Complexity theory, contrarian case analysis, and multiple realities. *Journal of Business Research*, 67(12), 2495-2503.
- Wu, P. L., Yeh, S. S., Huan, T. C., & Woodside, A. G. (2014). Applying complexity theory to deepen service dominant logic: Configural analysis of customer experience-and-outcome assessments of professional services for personal transformations. *Journal of Business Research*, 67(8), 1647-1670.
- Zadeh, L. (1965) Fuzzy Sets. *Information and Control* 8, 338-353.