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ABSTRACT

A New Unified Theory of Sociobehavioral Forces*

This paper proposes a new unified theory of sociobehavioral forces. The goal of the new theory is to integrate theories describing five sociobehavioral processes – comparison (including justice and self-esteem), status, power, identity, and happiness – bringing under a single theoretical umbrella diverse mechanisms together with their effects across disparate domains and for both individuals and societies. The integration is made possible by the remarkable similarity of the internal core of the theories, a core comprised of three elements: personal quantitative characteristics, personal qualitative characteristics, and primordial sociobehavioral outcomes. The unified theory posits the operation of three sociobehavioral forces – comparison, status, and power – each associated with a distinctive mechanism, in particular, a distinctive rate of change of the outcome with respect to the quantitative characteristic. Each combination of elements – e.g., status-wealth-city – generates a distinctive identity and a distinctive magnitude of happiness. Thus, the theory enables systematic and parsimonious analysis of both individuals and societies via the distinctive configurations of elements. To illustrate the unified theory, we analyze the three-way contest between loyalty to self, subgroup, and group in a two-subgroup society, deriving many new testable predictions, for example, that the bottom subgroup will have difficulty mobilizing itself, that the ablest individuals in a society will not make good leaders as their first loyalty is to self, and that the proportions loyal to self, subgroup, and group differ sharply, depending on the sociobehavioral forces, valued goods, and subgroup size. Finally, the theory provides a foundation for making explicit connections among the most important themes and insights of contemporary social science, including inequality, oppositional culture, group boundary permeability, social inclusion and exclusion, segregation and integration, social distance and polarization, and bonding and bridging.

JEL Classification: C02, C16, D1, D31, D6, I3

Keywords: justice, comparison, status, power, identity, happiness, inequality, personal quantitative characteristics, personal qualitative characteristics, individualism and collectivism, lognormal distribution, Pareto distribution, power-function distribution, rectangular distribution, exponential distribution, normal distribution

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A place for everything, and everything in its place.

– Samuel Smiles, 1875

1. INTRODUCTION

This paper proposes a new unified theory of sociobehavioral forces. The goal of the new theory is to integrate theories describing five sociobehavioral processes – comparison, status, power, identity, and happiness – bringing under a single theoretical umbrella diverse mechanisms together with their effects across disparate domains and for both individuals and societies. The integration is made possible by the remarkable similarity of the internal core of the theories.

Substantively, the key idea can be traced to Plato and Aristotle, in Aristotle's (Politics, Book 7, Chapter 8) words: "Different men seek after happiness in different ways and by different means, and so make for themselves different modes of life and forms of government." The new theory formalizes the "different ways and ... different means" of seeking happiness by the operation of three sociobehavioral forces, in which the primordial sociobehavioral outcomes which give each force its name (status, power, comparison) are generated by distinctive mechanisms from personal quantitative characteristics (such as beauty and wealth) within groups formed by categories of personal qualitative characteristics (such as nativity, race, and gender). For example, status is generated from beauty within a classroom. Each bundle of elements, say, status-beauty-classroom, simultaneously generates an identity and a magnitude of happiness. Different combinations of elements – e.g., power-wealth-club, status-horsemanship-cavalry – generate distinctive identities and magnitudes of happiness.[1], [2]

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[1] Aristotle's incisive formulation can be traced to Plato's (Republic, Book VIII) insight that "governments vary as the dispositions of men vary." Plato goes on to say, "there must be as many of one as there are of the other" and "if the constitutions of States are five, the dispositions of individual minds will also be five" – insights evoked in the work reported below, which identifies and distinguishes five types of societies.

[2] Justice is a special case of the comparison force. For convenience, the comparison force will sometimes be called the justice force, but it should always be understood that "justice force" is a shortcut for "justice and all the other members of the class of comparison processes."

A person's time series of bundles – or, equivalently, time series of identities – together with the associated configuration of elements, describes the person's inner sociobehavioral life in the pursuit of happiness. Some persons dwell on beauty, others on skill, others on possessions (an aspect of reality captured in Shakespeare's Sonnet 91); concomitantly, some persons inhabit worlds bounded by race, nativity, or sex; and while some are moved by status, others fix on justice or power.

The configurations of elements in the sociobehavioral profiles of individuals in turn produce the societal configuration. Thus, both individuals and societies come to be seen as materialistic or status-conscious or racialist – or, alternatively, as even-keeled, absent any great preference for status over self-esteem, or wealth over intelligence, or nativity over gender. And models based on the new unified theory yield a large number of testable predictions (both intuitive and counterintuitive, and including novel predictions) for a wide range of phenomena at both micro and macro levels and across disparate topical domains, revealing the thread from the inner sociobehavioral life to the myriad of individual sentiments and behaviors and finally to social phenomena at every scale, from dyads to small groups to nation-states and multinational entities.

The work reported in this paper began with two parallel lines of inquiry. The first, reported in Section 2, examines the nature of a sociobehavioral force. The second, reported in Jasso (2007), examines theories of status, comparison, and identity. This research showed that the theories share a common core of the three elements which comprise a sociobehavioral force, outlined in Section 2 below (viz., the sociobehavioral outcomes, the personal quantitative characteristics, and the personal qualitative characteristics), that, as the names indicate, status theory and comparison theory are each theories of a single sociobehavioral force, and that identity is compatible with all the sociobehavioral forces. That work also suggested some of the payoffs to unification: identity theory can use the mathematical formalizations of status and justice theories and, in turn, status and justice theories can use the vocabulary and imagery of identity theory, so that the scope of application and predictive capacity of all the theories is

enlarged.

Combining Plato's and Aristotle's classical insights with the newly-found common core makes it possible to build a new unified theory, presented in Section 3. The new theory is in the spirit of a growing body of work that explores links across processes and their theories and seeks unification, integration, and synthesis (Clark 1995; Hogg, Terry, and White 1995; Kemper and Collins 1990; Stets 1997; Stryker and Burke 2000; Törnblom and Vermunt 1999; Turner 1995; Wagner and Berger 1985 – see also the recent collection assembled by Törnblom, Jasso, and Vermunt 2007 and the references cited therein).[3]

In the unification all the theories win. The component theories achieve sharper definition through the contrasts between them. The theories can borrow from each other aspects of their analytic structure, their methods, and their imagery. Together they shed new light on a wide range of phenomena and processes from family to crime, from inheritance to race relations, from inequality to happiness. Importantly, the competition between sociobehavioral forces is brought into relief, for the same combinations of quantitative and qualitative characteristics can have profoundly different effects on individual and society depending on the third element, the primordial sociobehavioral outcome. Thus, the whole is greater than the sum of its parts, for the whole includes the competition between, and the differential impacts of, each part.

Two challenges arise: (1) theoretical – deriving Popperian "new predictions" that illuminate the competition between the sociobehavioral forces, the ensuing configuration, and the impacts of the configuration, thus extending the frontier beyond the predictions of the component theories; and (2) empirical – testing the derived predictions. Along the way, new terms appear, such as a distinction between pre-existing subgroups and emergent subgroups, and new questions, such as whether inequality is greater in the primordial sociobehavioral outcome or in the characteristic from which it is generated – say, in status or in wealth (Jasso and Kotz 2007).

Throughout, there is a spirit of parsimony, the theory beginning with a minimum of terms

[3] Links between positive and normative work are also important to establish, as in Wegener (2001).

and all other terms obtained from the starting terms and linked to them in precise ways.

The theoretical task is illustrated with analysis of emergent attachments to self, subgroup, and society, and a contrast which shows the dramatic effects of the configuration of identities on the overall proportions who put self first or subgroup first and the associated subgroup-specific proportions. Whether the Selfistas or the Subgroupistas or the Groupistas dominate, in the entire society as well as in their own race or ethnic subgroups, depends on the Platonic dispositions and Aristotelian ways and means of seeking happiness. Many other implications are generated, for example, that the bottom subgroup will have difficulty mobilizing itself, that loyalty to the top subgroup is undermined by the presence of self-seekers, that whistleblowers will tend to come from the bottom subgroup, and that it is a mistake to entrust important group-wide matters to "the best and the brightest" for they tend to put their interests ahead of the group's.

Though much remains to be done, the new theory promises a simple way to a synthesis with, in Samuel Smiles' (1875) words, "A place for everything, and everything in its place."

2. SOCIOBEHAVIORAL FORCES AND THEIR THREE ELEMENTS

The goal of the new unified theory is to integrate theories describing five sociobehavioral processes – comparison, status, power, identity, and happiness. We propose that comparison, status, and power comprise a trio of sociobehavioral forces which jointly give rise to identity and to happiness. The three may be thought of as dimensions of happiness, producing degrees of happiness and unhappiness whenever they are salient, and simultaneously as engines of identity. Happiness, however, is broader than identity, susceptible of production outside the sociobehavioral world – from a sunset, a melody, food and wine.

The core of each sociobehavioral force (and hence of each of the component theories as well as of the unified theory) includes three elements, one from each of three sets:

- personal quantitative characteristics
- personal qualitative characteristics

- primordial sociobehavioral outcomes

Personal quantitative characteristics are personal characteristics of which there can be more, or less. These are of two kinds: (1) cardinal, such as wealth, land, head of cattle; and (2) ordinal, such as beauty or athletic skill. If more is preferred to less, personal quantitative characteristics are called goods; if less is preferred to more, they are called bads. To illustrate, for most people, wealth is a good and time in prison is a bad. In the language of philosophy, goods are what people want. They want goods not only for their own sake, but also for the sake of happiness (Aristotle [384-322 B.C.] 1952, Nicomachean Ethics, Book 1, chap. 7). In the language of theology, goods are the things humans pray for, while bads (whose classic account is found in the Book of Job) are the things humans pray to be spared from.

Personal qualitative characteristics are unorderable, categorical personal characteristics. They may be dichotomous, like gender, or polytomous, like race, ethnicity, or religious affiliation.[4]

The primordial sociobehavioral outcomes (PSOs) are generated from quantitative characteristics within the groups formed by categories of qualitative characteristics; this is the fundamental template for a sociobehavioral force. The global process, including all three elements, is called by the name of the PSO and characterized as a behavioral engine, a driver, a mechanism, or a motivational process. For example, the sociobehavioral force "status" subsumes the status PSO, the distinctive mechanism associated with the PSO, the quantitative characteristics from which the status PSO is generated, and the qualitative characteristics within whose categories the status PSO is generated.[5] Importantly, each force has a long reach and yields implications for farflung phenomena and associations. The three sociobehavioral forces are quintessential, foundational examples of the mechanisms studied by Hedström (2005).

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[4] The idea that there are two kinds of personal characteristics, quantitative and qualitative, and that they differ in their social operation was pioneered by Blau (1974).

[5] In mathematical vocabulary, the status variable is the dependent variable in the status function whose arguments are quantitative characteristics within a group defined by qualitative characteristics.

How many sociobehavioral forces – or, equivalently, primordial sociobehavioral outcomes – are there? I believe there are three. The reasoning is based on the fact that there are three possible rates of change – increasing, decreasing, and constant – and thus any PSO which increases with the actual holding of a good must fall into one of three sets. If there is order in the world, then we would expect all three sets to be represented.[6]

What are the three sociobehavioral forces? There is a sociological tradition which takes justice, status, and power as the three "master" mechanisms (see, for example, Homans 1974:231 and the discussion in Jasso 2006b). Justice and its sibling comparison processes (like self-esteem) increase at a decreasing rate with the actual holding of a good, while status increases at an increasing rate with the actual holding of a good.

Comparison. The comparison function is a function of two variables, an actual holding A and a comparison holding C, with A and C having opposite effects on the outcome (say, self-esteem or the justice evaluation), denoted Z:

$$Z = \theta \ln\left(\frac{A}{C}\right), \qquad \textbf{(1)}$$

where θ is the signature constant whose sign is positive for goods and negative for bads and whose absolute value measures the observer's expressiveness. Jasso (1978) introduced the log-ratio function as a representation of the justice evaluation function, and subsequently generalized it to all comparison processes (Jasso 1990). The log-ratio comparison function has several appealing properties. First, it provides an exact mapping from combinations of A and C to the comparison outcome Z, with zero representing a neutral point, positive numbers representing positive self-esteem or overreward in the justice case, and negative numbers representing negative self-esteem or underreward in the justice case. Second, the function integrates rival conceptions of comparison processes as a difference and as a ratio. Third, it embodies the

[6] This reasoning echoes Plato's (Republic, Book VIII) idea that the number of dispositions must equal the number of governments. However, it could be argued that the three rates of change constrain the number of forces to "at most" three, a line of reasoning suggested by Richard Breen.

property that deficiency is felt more keenly than comparable excess, a feature of most sociobehavioral accounts of comparison processes. Fourth, the function is the only function which satisfies two other desirable conditions, additivity (the effect of *A* on *Z* is independent of the magnitude of *C*, and the effect of *C* on *Z* is independent of the magnitude of *A*) and scale invariance (expressing *A* and *C* in different units – say, yen instead of dollars – does not alter *Z*). Fifth, the function is symmetric; that is, if the actual holding *A* and the comparison holding *C* trade places, the outcome is the negative of *Z*. Sixth, the log-ratio form is the limiting form of the difference between two power functions, integrating log and power approaches and further strengthening integration of difference and ratio approaches. Recently, another (almost magical) property has come to light, linking the JEF and the Golden Number, $(\sqrt{5}-1)/2$. Further detail on these properties is found in Jasso (1978, 1990, 2006b, in press).

Note that there is one case in comparison theory when a qualitative characteristic is not required – the case in which the good (or bad) is cardinal and the comparison holding is a directly selected amount. For example, the "just income" term in a justice evaluation or the "expected wealth" term in a comparison function could be a directly selected quantity of money, independent of any group or collectivity. For extended discussion, see Jasso (2007, in press).

Status. The status function expresses the individual's status *S* as a function of his or her relative rank *r* on a quantitative characteristic, such as beauty, intelligence, or wealth:

$$S = \ln\left(\frac{1}{1-r}\right), \qquad \textbf{(2)}$$

where the relative rank is calculated within a group defined by a qualitative characteristic.[7] Sørensen (1979) introduced the status function, applying it to occupations. Earlier Goode (1978) had argued that status increases at an increasing rate with the actual holding (implicitly of a good). Noting that the function satisfies Goode's (1978) convexity condition, Jasso (2001) applied it to the status of individuals and used it as the starting postulate in a theory of status.

[7] The status variable is termed "S1" in Jasso (2001).

Power. Power is widely thought to increase with personal quantitative characteristics – such as wealth – but the research record is sparse with respect to the form of the function (Webster 2006). Thus, the power force is compatible with a constant rate of change.

Provisionally, we accept justice and status as two PSOs, and we call the third PSO – with a constant rate of change -- power, recognizing that it could be something else. It is possible, for example, that status and power are identical – both displaying an increasing rate of change – with the third PSO something else, perhaps freedom.[8]

We note at the outset that the new unified theory provides fertile ground for analyses of many kinds – theoretical and empirical; quantitative and qualitative; pertaining to the common elements (personal characteristics), pertaining to one sociobehavioral force alone, and pertaining to the global set. If the new unified theory can be thought of as a tree, there will be work on the trunk – e.g., the personal characteristics whose understanding shapes understanding of the three component theories – work on one branch, or work on the entire canopy.

Moreover, because the processes it integrates have a long reach, touching vast and disparate domains of the human experience, the new theory has the potential for unifying many social science traditions and concerns. Further, the new theory clarifies many zones of ambiguity. For example, the new view that comparison, status, and power are dimensions of happiness clarifies previous discrepancies in specifications of happiness: all the specifications (as a comparison process or not; as concave, convex, or linear) are correct, each corresponding to one of the component PSOs, each with its own periods of salience and latency. And the new idea that the chief distinguishing characteristic of the three PSOs is the rate of change renders understandable the difficulty of disentangling their operation and also increases our appreciation for the sociologists of the mid-twentieth century who prized the second derivative.

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[8] To save space, we omit detailed discussion of bads, which are straightforwardly incorporated. For example, by symmetry, a PSO which increases at a decreasing rate with a good will decrease at an increasing rate with a bad; a PSO which increases at an increasing rate with a good will decrease at a decreasing rate with a bad; and a PSO which increases at a constant rate with a good will decrease at a constant rate with a bad.

3. UNIFICATION OF THE THEORIES OF COMPARISON, STATUS, POWER, AND IDENTITY

Examination of comparison theory, status theory, and identity theory, reported in Jasso (2007), indicates that the same three elements operate at the core of each theory, that status theory and comparison theory are indeed theories of sociobehavioral forces, and that identity theory is compatible with operation of all sociobehavioral forces. Thus, the three theories are ripe for unification into a deeper sociobehavioral theory. Moreover, invoking the reasoning in Section 2 concerning rates of change in the mechanisms associated with sociobehavioral forces, we include in the unification a third sociobehavioral force whose rate of change is constant and which provisionally we call power.[9] The new deeper theory makes use of all the insights, imagery, and formalization from the component theories, while forging ahead with new questions which could not have been posed from within each theory alone and, similarly, with new predictions which could not have been obtained from within each theory alone as well as new empirical strategies which could not have been formulated from within each theory alone.

3.1. Preliminaries: A New Conceptualization of Self and Identity

As discussed in Jasso (2007), identity theory regards the self as a collection of identities. Although sociological identity theory highlights a quantitative characteristic and social identity theory highlights a qualitative characteristic, both variants of identity theory require both quantitative and qualitative characteristics in order to build an identity.

Meanwhile, work on comparison theory suggests that the basic ingredients of a comparison situation are a good and a group. Each good-and-group combination generates a particular magnitude of the comparison function or the justice evaluation function, and every

[9] Future research might analyze the fit between social scientific accounts of power and the third sociobehavioral force which increases at a constant rate with personal quantitative characteristics. As discussed in the literature, the idea of power involves both making things happen for self as well as making things happen in the behavior of others, and both are advanced by personal attributes and possessions.

time either the good or the group changes, a new score is generated.[10] This extreme fluidity has led comparison theorists to postulate the existence of a comparison profile for each individual, with ups and downs, plateaus and precipices, etc.

It is evident that the comparison profile (or justice profile) operates in comparison theory in the same way that the self operates in identity theory and social identity theory. Both may be thought of as collections of combinations of quantitative and qualitative characteristics and PSOs. Because different PSOs operate differently – contrast, for example, the comparison formula (1) and the status formula (2) – it is evident that the identities in the self cannot be understood without explicit identification of the associated PSO. The same combination of quantitative characteristic and qualitative characteristic will be experienced quite differently – producing a different identity – depending on whether the active force is comparison or status.

Thus, a more precise characterization of the identities which make up the self will include all three elements. A status-beauty-classroom combination generates a different identity from a status-intelligence-classroom combination, and both differ from a comparison-beauty-classroom combination and a comparison-intelligence-classroom combination. And so on.

Every person, then, has a repertoire of identities, a repertoire that may itself change over time. Exactly as discussed in each theory, fruitful research questions pertain to activation, salience, relative importance of each identity, and so on. What is distinctive in the new unified theory is the explicit recognition that an identity is a bundle of three elements and is generated by the operation of a sociobehavioral force.

Some groups have a subgroup structure based on a qualitative characteristic. For example, the status-intelligence-classroom identity discussed above may be generated in a classroom which has sex-specific subgroups. But a subgroup structure based on a qualitative characteristic is not the only kind of subgroup structure. A second kind of subgroup structure

[10] The situation is actually a bit more complicated, for, besides requiring a good and a group, a comparison process also requires a comparison standard; and every time the comparison standard changes, the comparison score also changes. Moreover, the comparison situation can refer to a bad, so that its scope is more general than the good-and-group characterization.

arises from operation of the sociobehavioral forces; to illustrate, justice mechanisms generate three subgroups, the underrewarded, the fairly rewarded, and the overrewarded. To distinguish between these two kinds of subgroup structure, we use new terms. Subgroups based on qualitative characteristics are called pre-existing subgroups; subgroups that arise from the operation of the sociobehavioral forces are called emergent subgroups. Further, groups with pre-existing subgroups are called heterogeneous groups, and groups without pre-existing subgroups are called homogeneous groups. As will be seen, the new unified theory enables analysis of the many kinds of emergent subgroups and the ensuing coalitions of persons from different pre-existing subgroups, providing fertile terrain for building on the keen insights of recent research on group and subgroup dynamics, boundaries and their permeability, and bonding and bridging activities (Brubaker and Cooper 2000; Eder and Giesen 2001; Eisenstadt and Giesen 1995; Ellemers, Spears, and Doosje 2002; Fahey, Hayes, and Sinnott 2005; Giesen [1993] 1998; Lamont and Molnár 2002; Putnam 2000).

3.2. Basic Postulates of the New Unified Theory

The basic postulates of the new unified sociobehavioral theory can now be stated:

Postulate 1 (Forces). There are three basic sociobehavioral forces – comparison, status, and power.

Postulate 1.1 (Elements of the Forces). Operation of each force involves a bundle of three elements, one from each of three sets: (1) personal quantitative characteristics (such as beauty or wealth); (2) personal qualitative characteristics (such as race or gender); and (3) primordial sociobehavioral outcomes (such as status or self-esteem). The primordial sociobehavioral outcome (which gives the force its name) is generated from a personal quantitative characteristic within a group formed by a personal qualitative characteristic.

Postulate 1.2 (Measurement Rule). All quantitative characteristics in the status force and ordinal characteristics in the comparison and power forces are measured by the relative rank within the group formed by the qualitative characteristic.

Postulate 1.3 (Rate of Change). The three forces each have a distinctive rate of change.

When the quantitative characteristic is a good, the comparison PSO increases at a decreasing rate of change, the status PSO increases at an increasing rate of change, and the power PSO increases at a constant rate of change.

Postulate 2 (Identity). Each operation of a sociobehavioral force generates an identity.

Postulate 2.1 (Personality). Each person is a collection of identities, and thus can be characterized by the configuration of elements in the identities, termed personality.

Postulate 2.2 (Culture). Each group is a collection of persons, and thus can be characterized by the configuration of elements in the members' identities, termed culture.

Postulate 3 (Happiness). Each operation of a sociobehavioral force generates happiness, but happiness is also generated by forces outside the sociobehavioral world.

From this basic set of postulates it is possible to derive many testable implications for a wide variety of individual and social phenomena. As well, the basic theoretical structure yields new terms and relations. For example, if a person is a collection of identities and personality is the individual-specific constellation of combinations of PSOs, quantitative characteristics, and qualitative characteristics, then it is natural to speak of the status-obsessed or the beauty-fixated or the gender-conscious. Similarly, if a group is a collection of persons and culture is the group-specific constellation of elements in its members' identities, then it is equally natural to speak of a jock culture, a materialistic culture, a racialist culture, and so on.

It has long been thought that the sociobehavioral forces generate emotion, and the idea immediately presents itself that the valence of the emotions may match the valence of the PSO in the identity. To illustrate, in this (testable) view, comparison outcomes of zero generate a neutral emotion, negative comparison outcomes (such as underreward) generate negative emotion, and positive comparison outcomes (such as overreward) generate positive emotion (Jasso 2006a).

3.3. A Deeper Theoretical Form: Template for an Identity

The foregoing discussion, formalized in the basic set of three postulates, suggests the existence of a deeper theoretical form, a form which can be succinctly described by the template for an identity. We provide two versions of the template, applicable, respectively, to

homogeneous and heterogeneous groups:

> 1. Homogeneous-Group Version. [A primordial sociobehavioral outcome] is generated from [a quantitative characteristic] (possibly by reference to a group formed by [a qualitative characteristic]).
> 2. Heterogeneous-Group Version. [A primordial sociobehavioral outcome] is generated from [a quantitative characteristic] (possibly by reference to a group formed by [a qualitative characteristic]) and contrasted across the categories of [a second qualitative characteristic].

Consistent with our discussion above, both versions of the template accommodate the possibility that a qualitative characteristic is not required for generating the PSO (Jasso 2007, in press). Of course, the heterogeneous-group version of the template incorporates the basic ideas of social identity theory, and qualitative characteristics play an essential part.

Use of the template facilitates disciplined specification of the research situation, operating as a check list. In theoretical work, the researcher decides whether to model the situation by one or more PSOs, by one or more quantitative characteristics, and as a homogeneous or heterogeneous group. In empirical research of the observational kind, the researcher must discern whether the situation under observation can be faithfully characterized by one or another PSO, what the valued goods and bads are, what the pertinent qualitative characteristics and their categories are.[11] In empirical research of the experimental kind, the researcher chooses the dimensions to experimentally manipulate from among a selection of PSOs, quantitative characteristics, and qualitative characteristics.

The mix-and-match strategy implicit in the templates produces new synergies. The new unified theory can use both the vocabulary and imagery of identity theory and the mathematical functions of comparison, status, and power theories to generate both new measures of identity,

[11] Examples of recent empirical research which measures identities using the trio of elements include Bianchi and Lancianese (2005) and Kwon and Meyersson Milgrom (2005).

new testable predictions, new interpretations, and rich new perspectives, all within a simple framework that is easy to use.

3.4. The Individual's Sociobehavioral Profile and the Happiness Profile

The point of departure for most research on comparison, status, and power processes is a single primordial sociobehavioral outcome. For example, a justice study typically does not look beyond the world of justice; it is assumed that justice is the PSO operating in the particular situation under analysis. The unification, however, makes plain that the sociobehavioral forces are in competition with each other for the actor's attention. Thus, the unification leads to explicit consideration of the possibility that one or another PSO is chosen, that individuals differ in the extent to which each PSO occupies their mind, that, indeed, lurking beneath the individual's comparison profile or status profile or power profile is a more fundamental sociobehavioral profile in which comparison, status, and power forces appear and disappear over time. This deeper sociobehavioral profile is a subset of the happiness profile, consistent with the view that PSOs are among the things that generate happiness.[12]

3.5. Correspondence Between the Vocabularies of the Component Theories

An important task in a unification is to establish the correspondence between the vocabularies in each of the component theories. Table 1 presents the basic quantities in the unified sociobehavioral theory, providing their mathematical formulas and the corresponding terms in identity, comparison, status, and power theories. As shown, the first term is the personal identity. As discussed, the personal identity is a bundle of three elements, one of which, the PSO, determines the form of the function generating the identity. For example, if the PSO in a particular identity is comparison, then the identity is generated by the comparison function (shown in the comparison theory column). Consistent with the reasoning that power (or something provisionally called power) increases at a constant rate with the actual holding of a

[12] Periods of time when the sociobehavioral forces are latent differ across individuals in duration and frequency. They extend into the individual's waking time the freedom from hierarchies, status, and other elements of sociobehavioral forces which Cervantes (Don Quixote, Book II, Ch 43) saw as a gift of sleep, "When we sleep, we are all equal."

good, the power function is represented by a linear function (omitting intercept and slope, for which further theoretical analysis is needed).

– Table 1 about here --

The next quantity is the group identity. This is the average identity (or, equivalently, average PSO) in the entire group. In justice analysis, this quantity is known as the first justice index, or JI1 (Jasso 1999), and also as the social welfare function (Jasso 1993:360). The counterpart in status theory, group *S*, is known to approach 1 as the group size goes to infinity (Jasso 2001:106, 122).

Recall that qualitative characteristics provide not only the group within which the identity is generated but also the basis for a possible (pre-existing) subgroup structure. For example, if the group is generated by citizenship in a particular country, potential subgroups include province, gender, race, ethnicity, language, religion, and so on. Note that the qualitative characteristic used to define the group cannot be used as the basis for subgroups. To illustrate, if the PSO is generated by athletic skill within the set of males, then the group is sex-specific and sex cannot be used to generate subgroups; permissible bases for subgroup structures would include language, religion, nativity.

The subgroup identity is the average identity (or, equivalently, average PSO) within a subgroup. The quantity is equivalent to subgroup *Z*, in comparison theory, and to S2 status, in status theory (and basic to S3 status). This quantity is closely linked to the process of depersonalization in social identity theory, in which a person comes to be seen as a member of a subgroup rather than as an individual, and to the prototype, a quantity which summarizes the subgroup's distinctiveness.

The three quantities in Table 1 are the basic quantities in the new unified sociobehavioral theory. They are used in many models based on the sociobehavioral forces. Other quantities that arise include the multiple-good PSO, dispersion of the PSO within group and subgroups, a variety of differences between the personal, subgroup, and group identities, the change in PSO across time, and, of course, quantities based on the emergent subgroup structures. For example,

the difference between two subgroup identities is the absolute-gap measure of inequality between subgroups (Jasso and Kotz in press) and also provides a measure of what is called social distance or polarization.[13]

The formulas in Table 1 are general formulas. Specific formulas are tailored for use with cardinal or ordinal holdings and in small groups or large populations. Table 2 reports the specific formulas for the personal identity; to conserve space, we do not include the corresponding specific formulas for the group and subgroup identities. The formulas for comparison theory and status theory have been discussed in the literature; there is no guidance, however, for the power formulas (Webster 2006). Because scale invariance is important for comparative analysis, we represent cardinal goods in power theory by the relative amount and ordinal goods by the relative rank. However, in the cardinal case power may also turn out to be a function of the absolute amount (Jasso in press).

– Table 2 about here –

Note that because there are three PSOs and because two of them distinguish between cardinal and ordinal characteristics, there are five possible general types of identities, represented by the five columns of Table 2.[14]

3.6. Research Protocols for Theoretical and Empirical Analysis in the New Unified Theory of Sociobehavioral Forces

Two theoretical tasks immediately present themselves. First, the substantial theoretical analysis that has been carried out separately on identity, comparison, status, and power can now be brought into a systematic synthesis, with explicit contrasts of the predictions for particular contexts and with identification of the lacunae to be filled. In Section 4 below we illustrate this

[13] For further discussion of multiple-good PSOs, see Berger, Cohen, and Zelditch (1966), Berger, Fisek, Norman, and Zelditch (1977), Jasso (1980, 1983, 2001), and Jasso and Kotz (2007), and of change in PSO, Jasso (in press).

[14] And it follows that there are five main types of societies, echoing Plato's (Republic, Book VIII) idea that there are five distinct dispositions of persons and corresponding to each a distinctive type of government.

type of work with an analysis of differential attachments to self, subgroup, and group. Second, new theorizing can focus on processes that span the entire theoretical structure; these include the process by which one or another of the three sociobehavioral forces becomes activated (complementing work on the process by which one or another good is activated and one or another group or subgroup is activated) and the links between inequality in the quantitative goods, inequality in the PSOs, and inequality in happiness.

Within the first theoretical task, consider the testable predictions that have been derived in comparison theory, including, for example: (1) A thief's gain from theft is greater when stealing from a fellow group member than from an outsider, and this premium is greater in poor groups than in rich groups; (2) Parents of two or more non-twin children will spend more of their toy budget at an annual gift-giving occasion than at the children's birthday; (3) Blind persons are less at risk of eating disorders than are sighted persons; (4) Veterans of wars fought on home soil have lower risk of posttraumatic stress syndrome than veterans of wars fought away from home; (5) Conflict between subgroups is an increasing function of economic inequality, but the effect of the subgroups' relative sizes depends on the form of the valued good's distribution; and (6) Vocations to the religious life are an increasing function of economic inequality.[15]

Would status theory and power theory yield similar or different predictions? To answer that question, parallel sets of predictions can be derived in status and power theory. The techniques that have proved useful in comparison theory can be immediately put to use; these include the micromodel, macromodel, mesomodel, and matrixmodel strategies, which have different starting points (e.g., the PSO, the change in PSO, the distribution of the PSO) and use different mathematical approaches (Jasso 2002).

An early example of a prediction for the same phenomenon based on all three PSOs is the prediction that in a society dominated by comparison, each person is closer to the neighbor above than to the neighbor below, while in a status society, each person is closer to the neighbor below

[15] These predictions exemplify the generative character of the sociobehavioral forces, which both generate and explain the associations embodied in the predictions.

than to the neighbor above, and in a power society, each person is equally close to the neighbors above and below – a consequence of the distinctive rates of change.

Comparison theory also yields interpretations of rare events, such as the invention of mendicant institutions in the 13th century and of detective fiction in the 19th. And it suggests the existence of fundamental constants, including a constant governing the switch between valuing cardinal and ordinal goods.

What new interpretations or new constants would status theory and power theory yield?

Within the second theoretical task, consider some of the new questions that arise in the unified theory. How do goods become valued and de-valued? How do groups and pre-existing subgroups become valued and de-valued? How do changes in the distributions of cardinal goods affect changes in the distribution of happiness? What are the precise links between culture and personality? between inequality between persons and inequality between subgroups? How is emotion generated? What accounts for differential permeability across boundaries of pre-existing subgroups and emergent subgroups?[16]

In theoretical work, all these questions can be addressed using simple a priori premises and reasoning. For example, questions addressed using the macromodel technique begin with the probability distribution of the PSO in a collectivity. When the quantitative characteristic is ordinal, it is represented by the rectangular distribution; when the quantitative characteristic is cardinal, it is represented by a distribution defined on the nonnegative support, such as the lognormal or the Pareto. Table 3 provides formulas for personal identity, group identity, and subgroup identity for all three PSOs for both the case of an ordinal good and three cases of a cardinal good (distributed as lognormal, Pareto, and power-function); the subgroup identity is for the special case of two pre-existing subgroups with complete disjuncture. These formulas can be

[16] Recent work has begun to address these questions. For example, Jasso (2006a) analyzes emotion, and Jasso and Kotz (in press) analyze the two types of inequality.

used in a wide variety of problems, and will be used in Section 4.[17]

– Table 3 about here –

Empirically, several tasks immediately arise, and they require a wide variety of skills, ranging from qualitative and comparative-historical skills – for example, to discern the valued goods, groups, subgroups, and PSOs across societies and over time – to quantitative skills – for example, to measure personal identities using the new template, measure inequalities both in goods and in PSOs both across persons and across subgroups, to estimate many new propositions (such as the effects of personal, subgroup, and group identity on health), and to test the new derived predictions.

The empirical work of the future will be multi-method and carried out by multi-skill teams.

4. ILLUSTRATION: THE CONTEST BETWEEN SELF, SUBGROUP, AND GROUP

To illustrate theoretical derivation in the new unified theory, we investigate the contest between individualism and collectivism, specifically, between personal identity, subgroup identity, and group identity, building on recent work which examines (1) the contest between subgroup status and group status (Blanz et al. 1998; Mummendey et al. 1999; Hornsey and Hogg 2002), (2) the contest between personal status and subgroup status (Jasso 2001), and (3) the contest between self, subgroup, and group in a justice regime (Jasso 2005). The remaining theoretical tasks are (1) to obtain the missing predictions, for example, for the 3-way contest in a status context and (2) to synthesize the results, distinguishing between general results and results contingent on PSO or type of good – tasks begun here.

4.1. Model of Individualism and Collectivism – General Setup

Consider a population in which a PSO is generated by a quantitative characteristic (such as beauty or wealth). The population can also be classified into (pre-existing) subgroups formed

[17] For information on the modeling distributions, see Johnson, Kotz, and Balakrishnan (1994, 1995) and Kleiber and Kotz (2003).

by the categories of a qualitative characteristic (such as race or gender).

Given that there are three possible attachments – three types of identity -- there are a priori six possible preference orderings (where the symbol "≻" denotes "is preferred to"):

1. Personal identity ≻ subgroup identity ≻ group identity
2. Personal identity ≻ group identity ≻ subgroup identity
3. Subgroup identity ≻ personal identity ≻ group identity
4. Subgroup identity ≻ group identity ≻ personal identity
5. Group identity ≻ personal identity ≻ subgroup identity
6. Group identity ≻ subgroup identity ≻ personal identity

Of course, given that preference is guided by self-enhancement, the foregoing preference orderings can be expressed as inequalities, with the inequality sign ">" replacing the preference symbol "≻".

The initial questions are: What proportions of the population can be characterized by each of the six preference orderings? and does the pattern vary by the proportions in the subgroups? Within the two subgroups, what proportions can be characterized by each of the six preference orderings? and does the pattern vary by the proportion in the subgroup?

Further questions pertain to the precise nature of the contest, the ensuing attachments to self, subgroup, or group, and the emergent subgroups. Each of the four possible contests -- (1) self vs subgroup, (2) self vs group, (3) subgroup vs group, and (4) self vs subgroup vs group -- generates distinctive attachments, which we can classify by contest, with the further classification in the 3-way contest of attachments based on the same first choice, the same second choice, or the same first or second choice. Further, we can assess which attachments are generated in more than one pre-existing subgroup, and thus investigate the possibilities for coalitions across pre-existing subgroups.

Following Jasso (2005), we refer to the emergent attachments and subgroups as Selfista, Subgroupista, and Groupista. Finally, we refer to a coalition based on the same first choice in a 3-way contest as a strong coalition, and to all other coalitions as weak coalitions.

These questions can be studied both theoretically and empirically. Here we undertake theoretical analysis.

4.2. Model of Individualism and Collectivism – Setup for Theoretical Analysis

For simplicity and convenience, let the qualitative characteristic be binary, so that there are two subgroups. Now let the quantitative characteristic and the qualitative characteristic be perfectly correlated, such that the bottom person in the top subgroup has a higher magnitude of the quantitative characteristic than the top person in the bottom subgroup. Thus, the two subgroups are nonoverlapping in the quantitative characteristic. This complete disjuncture appears in the social sciences under a variety of rubrics, such as consolidation in Blau (1974:632), accentuation in Hogg et al. (1995:261), and cleavage in Jasso (1983:281, 1993:364). It is further discussed in Jasso and Kotz (in press).

Our chief tool will be the macromodel technique for theoretical derivation (Jasso 2002). As in Tables 1-3, each personal identity is represented by the PSO's probability distribution, and the distribution in turn is represented by the quantile function, which expresses the PSO as a function of relative rank (for example, status as a function of relative rank in the good's distribution). The subgroup identity is represented by the subgroup-specific average personal identity, and the group identity by the population average personal identity. In this case of two subgroups and complete disjuncture, the distribution has a censored subdistribution structure in which the censoring point p corresponds to the boundary between the two subgroups. The proportions in the censored subdistributions are called the subgroup split. The bottom subgroup has p proportion of the population, and the top subgroup has $(1 - p)$ proportion.

4.3. General Theoretical Results for the Case of Two Nonoverlapping Subgroups

We begin with three facts, from which we will derive general results, and which can be visualized from the graphs of personal identity, subgroup identity, and group identity for any PSO, any good, and any subgroup structure, as in Figure 1 (later we will see which PSO corresponds to Figure 1). First, subgroup identity in the top subgroup is greater than group identity, which is greater than subgroup identity in the bottom subgroup. Second, within each

subgroup, personal identity intersects subgroup identity, such that to the left of the intersection subgroup identity is greater than personal identity and to the right of the intersection subgroup identity is lower than personal identity. Third, personal identity also intersects group identity; whether the intersection occurs to the left or right of the .5 relative rank depends on the skewness of the personal identity distribution. In Figure 1, a vertical line represents the subgroup boundary; short horizontal lines represent the subgroup identities, and a long horizontal line represents the group identity; the upward-sloping curve represents personal identity.

– Figure 1 about here –

Using these three facts, we can reason that each of the six preference orderings appears at most in one of the two subgroups. Thus, members of the two subgroups find themselves in very different circumstances with respect to the contest between individualism and collectivism; and there is no possibility of a cross-subgroup coalition based on the entire 3-way preference ordering. We can also reason that the relative location of (a) the intersection between personal identity and group identity and (b) the boundary *p* between the two subgroups plays an important part, determining whether two of the six preference orderings appear or not. Specifically, if the boundary *p* coincides with the intersection, then only four of the six preference orderings are represented. These are: (1) in the bottom subgroup, the Groupista>Subgroupista>Selfista and Groupista>Selfista>Subgroupista, and (2) in the top subgroup, the Subgroupista>Selfista>Groupista and the Selfista>Subgroupista>Groupista. Indeed, these four orderings always appear, but the remaining two orderings appear only in two special cases. The Selfista>Groupista>Subgroupista ordering appears only in the bottom subgroup and only if the boundary *p* lies above the intersection of personal identity and group identity; and the Subgroupista>Groupista>Selfista ordering appears only in the top subgroup and only if the boundary *p* lies below the intersection of personal identity and group identity.

These general theoretical results – which hold for all PSOs – are codified as follows:

1. For all subgroup splits, each preference ordering is found in only one subgroup.
2. The two preference orderings with the Groupista first choice are found only in the

bottom subgroup – that is, preference for superordinate categorization in the three-way contest is found exclusively in the bottom subgroup.

3. The two preference orderings with the Subgroupista first choice are found only in the top subgroup.

4. One of the two preference orderings with a Selfista first choice is found in the top subgroup always and the other in the bottom subgroup but only if the subgroup boundary lies above the intersection between personal identity and group identity.

5. If the subgroup boundary occurs below the intersection of personal identity and group identity, the entire bottom subgroup has the Groupista first choice.

6. If the subgroup boundary occurs above the intersection of personal identity and group identity, not all members of the bottom subgroup are Groupistas; a top subset of the bottom subgroup prefers personal identity to group identity, and the Groupistas are the lowest-ranking members of the bottom subgroup.

7. In the top subgroup, the entire subgroup never has the same first choice.

8. Self is the first choice of the top-ranking members of the top subgroup; it is also the first choice of the top-ranking members of the bottom subgroup when the subgroup boundary occurs to the right of the intersection of personal identity and group identity.

These initial theoretical results – which are ceteris paribus testable predictions – convey the promise of using identity theory and the sociobehavioral forces jointly. They suggest that a simple and parsimonious set of assumptions can generate an elaborate and intricate social reality, a reality in which societies may differ greatly in the extent to which their members are self-seeking, subgroup-seeking, or group-seeking and these differences are systematically related to the relative sizes of the subgroups. For all societies, regardless of the subgroup split, the strict correspondence between preference ordering and subgroup membership is striking.

Table 4 collects some general results which hold for all PSOs. Note in particular that the only options which ever attain unanimity involve Groupistas and that the most common coalitions are between Selfistas in the two subgroups and Subgroupistas in the two subgroups.

These two coalitions have a very different flavor. While a Selfista coalition is a union of fully kindred souls, a Subgroupista coalition is an alliance of segregationists in both subgroups.

– Table 4 about here –

Of course, precise quantitative results – which coalition commands a majority, for example – require derivation sharply tailored to the context.

4.4. A Close Look at the Case of Status

We now use the formulas for personal status, subgroup status, and group status presented in Table 3 to measure the proportions in each preference ordering in each subgroup. A key quantity is the intersection of personal status and group status. We already know that the average status for the entire group is equal to 1.[18] Solving the personal status formula for the relative rank at which it equals unity, we obtain the result $[1 - 1/e]$, or approximately .632.

4.4.1. General Results Applied to the Case of Status

We know from the general results (Section 4.3 and Table 4) that if the subgroup boundary exactly coincides with the intersection of personal status and group status, there are four preference orderings, with the Groupista option being the unanimous first choice in the bottom subgroup and the unanimous last choice in the top subgroup. If, however, the bottom subgroup has less than 63 percent of the population, there are three preference orderings in the top subgroup, and if the bottom subgroup has more than 63 percent of the population, there are three preference orderings in the bottom subgroup, the new preference ordering having self as first choice. Importantly, in the latter case (subgroup boundary above .63), there is a strong coalition of Selfistas.

Figure 1, it can now be told, provides visual representation of personal, subgroup, and group status in societies with two subgroups, for four subgroup splits. Panels A, B and D depict subgroup splits of .25-.75, .50-.50, and .75-.25, respectively. Panel C depicts a subgroup split of

[18] The result that the mean of the status distribution is 1 can be established in two ways: First, 1 is the limit, as *N* goes to infinity, of the arithmetic mean of status (the formula is in Table 3 in Jasso (2001:103)); second, 1 is the expected value of the probability distribution arising from status (see Appendix Table A in Jasso (2001:122)). See also Jasso and Kotz (2007).

.632-.368. Note the number of preference-ordering subsets (four in Panel C, five in the other three Panels), and note the possibilities for coalitions.

These results can be immediately applied to and tested in a wide range of situations. As an example, consider race. Suppose that the people of a given country think of themselves as members of that country; suppose further that they are of two races, that the two racial groups differ in economic advantage, and that status is generated by wealth. For the special case in which accentuation and disjuncture occur (whether or not objectively there is perfect correlation between race and wealth), these results indicate that the bottom subgroup is more committed to the group than is the top subgroup, that in the top subgroup people are committed either to the subgroup or to themselves, that the wealthiest people are committed to themselves, and that, in societies in which the bottom subgroup is larger than 63% of the population, the richest in the bottom subgroup are also committed to themselves. Note the dilemmas. The wealthiest, who may possess much knowledge useful for the welfare of the group as a whole, are absorbed in themselves, and the next wealthiest in the top subgroup. Similarly, those driven by concern for the common good (e.g., whistleblowers) come from the bottom subgroup.

If the two subgroups represent gender and the subgroup split does not reach .632, these results suggest that whistleblowers will be women. From the perspective of this framework it is not surprising that in the wake of corporate scandals and possible negligence of civil servants in averting terrorist attacks, the three heroes who would emerge are women – honored by Time Magazine as Persons of the Year for 2003 and described on the cover as "The Whistleblowers" (Lacayo and Ripley 2003).

4.4.2. Proportions in each Preference-Ordering Subset in a Status Society

Using the information in Table 3, we calculate the proportions in each preference ordering. Briefly, we find the endpoints of each preference-ordering subset by calculating the intersections of personal status, subgroup status, and group status; for example, the proportion in the bottom subset of the bottom subgroup is equal to the relative rank at the intersection of personal status and subgroup status. Table 5 reports the proportions of the entire population

found in each preference ordering.

– Table 5 about here –

There are several striking results in Table 5, which for convenience we list, enumerating them with an "S" prefix to denote the status sociobehavioral force (or, equivalently, status PSO):

S1. It is rare for one preference ordering to attract more than half the population. This situation occurs for two preference orderings only (Group>Subgroup>Self and Subgroup>Group>Self) and only in highly imbalanced subgroup splits.

S2. The Group>Subgroup>Self preference ordering, favored by the bottom subset of the bottom subgroup, attracts more than half the entire population in the case in which the bottom subgroup has more than 87% of the population (Table 5 indicates that this occurs between subgroup splits of .85 and .90, and mathematically we locate it at around .87).

S3. The Subgroup>Group>Self preference ordering, favored by the bottom subset of the top subgroup, attracts more than half the entire population in the case in which the bottom subgroup has less than .132 of the population (Table 5 shows this occurring between subgroup splits of .10 and .15, and the point is found by subtracting .5 from .632).

S4. The proportions increase/decrease monotonically with the subgroup split in some preference orderings but not in others. Those in which the proportions increase monotonically are both in the bottom subgroup – the Group>Subgroup>Self and the Self>Group>Subgroup (which occurs only when the subgroup split exceeds .632). Those in which the proportions decrease monotonically are both in the top subgroup – the Subgroup>Group>Self (which occurs only when the subgroup split is less than .632) and the Self>Subgroup>Group. The two remaining preference orderings, one in each subgroup, vary nonmonotonically, first increasing, then decreasing.

S5. There are symmetries in the monotonicity behavior. The bottom subset of the bottom subgroup and the top subset of the top subgroup both have preference orderings that vary monotonically with the subgroup split, doing so over the entire range, but they vary in opposite directions. The limited-range preference orderings occur in the rightmost subset of the bottom

subgroup and the leftmost subset of the top subgroup, and vary monotonically in opposite directions. The two preference orderings which vary nonmonotonically with the subgroup split both occur in the middle subsets of the two subgroups.

S6. Selfistas in the top subgroup are numerically strongest when the top subgroup has high proportions of the population. Selfistas in the bottom subgroup are numerically strongest when the bottom subgroup has high proportions of the population.

The substantial variation in the proportions shown in Table 5 suggests that there will be large differences across societies attributable to the subgroup split. The tone of social discourse, the cultural products, the quality of inter-subgroup relations will all vary with the subgroup split.

Meanwhile, the proportions in each preference ordering also shape intra-subgroup properties, as shown in Table 6:

– Table 6 about here –

S7. Only one preference ordering – Group>Subgroup>Self – commands a subgroup majority regardless of the subgroup split.

S8. The bottom subgroup is always dominated by Groupistas.

S9. The top subgroup is always dominated by Subgroupistas.

S10. The top subgroup has a fixed percentage of Selfistas of approximately 37 percent.

S11. The Selfistas in the bottom subgroup can be numerically strong when the overall group is heavily composed of members of that subgroup.

These group and subgroup results can be combined to characterize the entire society. For example, when the subgroup split is fifty-fifty, all of the bottom subgroup is Groupista, the top 37% in the top subgroup is Selfista, and the remaining members of the top subgroup are Subgroupistas (see Figure 1).

4.4.3. Selfista, Subgroupista, and Groupista in a Status Society

To this point we have examined preference orderings and first choices in terms of proportions within group and subgroup. We now shift the angle of vision to focus on the emergent Selfista, Subgroupista, and Groupista sets, classifying individuals based on their first

choice. Table 7 reports the proportions Selfista, Subgroupista, and Groupista, relative to the entire population, by subgroup boundary and subgroup.

– Table 7 about here –

Many of the results previously obtained now achieve a kind of dramatic intensity. Understanding behavior in organizations of all kinds – corporations, churches, armies, nations – requires assessing the individual's orientation and loyalties. These results indicate that loyalty to the overall group is found only in the bottom subgroup and that loyalty to subgroup is found only in the top subgroup. Thus, whistleblowers and those totally dedicated to the commonweal will come from the bottom subgroup. Concomitantly, the bottom subgroup will experience difficulty organizing itself for inter-subgroup confrontations. Meanwhile, the loyalty to subgroup found in the top subgroup will be undermined by the self-seekers in that subgroup.

If testing bears out these ceteris paribus predictions, then these results may serve also as an aid in policymaking and institutional design. There are obvious dilemmas. Suppose that the wealthy and the highly intelligent make the best spies. They will, however, be more loyal to themselves than to the group, and their behavior in the field may reflect a certain opportunism. The case of corporation CEOs also merits scrutiny from this vantage point; perhaps the brightest CEOs are not the best equipped to make decisions that benefit the corporation as a whole, as they may be unduly influenced by loyalty to self. Similarly, the study of nation-building may display some of these behaviors and dilemmas.

Turning to coalitions, Table 7 shows vividly the only strong coalition that is possible – between Selfistas when the proportion in the bottom subgroup exceeds .632.

The results in Table 7 can also be used to gauge the provenance of the Selfistas. While Selfistas are exclusively top-subgroup in origin when the subgroup boundary is below .632, the balance shifts rapidly once bottom-subgroup persons emerge as Selfistas. At a subgroup boundary of approximately .731, the breakeven point is reached, with Selfistas coming in equal numbers from the bottom and top subgroups. By a subgroup boundary of .8, bottom-subgroup persons dominate, with approximately 69.5% of the Selfistas. Selfista discourse may differ

markedly across different subgroup compositions.

Finally, note the possibilities in Table 7 for intra-group hostilities and political party composition. Simple majorities are visible at the extremes of subgroup split – with Subgroupistas from the top subgroup dominant at subgroup splits less than .25 and Groupistas from the bottom subgroup dominant starting at subgroup split of .5-.5. In between there are only pluralities, with the dominant set shifting from Subgroupistas in the top subgroup (at structures with subgroup boundary from .25 to .35) to Groupistas in the bottom subgroup.

4.4.4. Two-Way Contest: Self vs Subgroup in a Status Society

Suppose now that the Groupista option remains dormant, so that the contest reduces to self versus subgroup. In this case there are always both Selfistas and Subgroupistas in both subgroups, as shown in Table 8. Results for this special case (indicated by an asterisk) are immediate, spanning, as before, the structure of the group (depicted in Figure 2), of the subgroups, and of the emergent Selfistas and Subgroupistas:

– Table 8 about here –

– Figure 2 about here –

S1*. For all subgroup splits, the Subgroupistas are in the majority and the Selfistas in the minority.

S2*. Both the proportion Subgroupista and the proportion Selfista vary nonmonotonically with the subgroup split, the proportion Subgroupista convex, the proportion Selfista concave.

S3*. The proportion Subgroupista reaches its low of approximately .573 and the proportion Selfista its high of approximately .427 at a subgroup split of approximately 70-30.

S4*. Within both subgroups, the Subgroupistas are in the majority.

S5*. In the top subgroup, the proportions Subgroupista and Selfista are constant at 63.2% and 36.8%, respectively.

S6*. In the bottom subgroup, the proportions Selfista and Subgroupista depend on the subgroup split. The proportion Subgroupista increases with the proportion in the bottom

subgroup, and the proportion Selfista decreases.

S7*. The proportion Subgroupista in the top subgroup (63.2%) always exceeds the proportion Subgroupista in the bottom subgroup.

S8*. The proportion Selfista in the bottom subgroup always exceeds the proportion Selfista in the top subgroup (36.8%).

S9*. Subgroupistas are predominantly drawn from the top subgroup when the subgroup boundary is less than .5, but thereafter the membership is drawn more heavily from the bottom subgroup.

S10*. Selfistas are predominantly drawn from the top subgroup when the subgroup boundary is less than .45, but thereafter the membership is drawn more heavily from the bottom subgroup.

4.5. Toward a Synthesis Across Sociobehavioral Forces

We have examined the contest between personal identity, subgroup identity, and group identity and derived some general results and have also taken a close look at the contest when the sociobehavioral force is status. How different are the special results when the active force is comparison or power? To begin to address this question, we report one set of results for both status and comparison. These are results based on the 2-way contest between self and subgroup.

Recall the results S1*, S2*, and S3* describing the proportions Selfista and Subgroupista in the population, and look again at Figure 2. With status as PSO, Selfistas are always in the minority and Subgroupistas in the majority. To summarize parallel results for the comparison PSO, we present graphs of the proportions Selfista and Subgroupista by the subgroup split. While status can be represented by a single graph, comparison requires several graphs, one for the ordinal case and one each for the cardinal case with different distributions of the cardinal good. Here we provide graphs for three models of the cardinal good, distributed, respectively, as lognormal, Pareto, and power-function. Experience with these variates alerts us to similarities and symmetries. First, the status distribution and the comparison distribution arising from a Pareto valued good are negative exponentials. Second, the comparison distributions arising from

an ordinal good and from a power-function good are positive exponentials. Third, the positive exponential and the negative exponential are mirror images of each other. Fourth, the comparison distribution arising from a lognormal good is normal.

The graphs depicted in Figure 3 display the expected similarities and symmetries. The behavioral implications, however, are striking. For example, holding constant an ordinal valued good – say, athletic skill or military prowess – a change of PSO from status to comparison decimates the fighting strength of the Subgroupistas and catapults the Selfistas to a position of primacy. More intricately, holding constant the comparison PSO, a change in the distribution of valued material possessions from Pareto to lognormal can have opposite effects depending on the subgroup split.

– Figure 3 about here –

The diverse societies and configurations of Selfistas and Subgroupistas in Figure 3 make vivid Plato's and Aristotle's idea that the ways in which individuals seek happiness for themselves generate distinctive and profoundly different social structures.

There is a further, surprising, result: Inequality in the distribution of valued cardinal goods has no effect on the proportions Selfista and Subgroupista. To our knowledge, this is the first theoretical derivation in comparison theory in which the inequality parameter vanishes.

It is obvious that these results are pertinent to a wide range of applications, from social stratification, economic sociology, cultural sociology, family sociology, and rational choice sociology to inter-subgroup relations of all kinds, such as gender relations, race relations, and immigrant-native relations. For example, if the two pre-existing subgroups are young and old, these results can illuminate intragenerational and intergenerational dynamics. If the two pre-existing subgroups are racial, these results predict preferences for segregated and integrated neighborhoods and schools. Thus, to illustrate, the configuration of sociobehavioral force, distributional form of the valued good, and percent in the disadvantaged subgroup predicts the configuration of segregated and integrated neighborhoods, including the proportion of the disadvantaged subgroup living in segregated neighborhoods, the proportion of the advantaged

subgroup living in segregated neighborhoods, the proportion disadvantaged in integrated neighborhoods, and so on.

Of course, the new unified theory predicts many other behavioral and social phenomena as well.

5. CONCLUDING NOTE

The new unified theory proposed in this paper can be traced to three sources: (1) the classical idea from Plato and Aristotle that humans seek after happiness in different ways and thus build different kinds of societies; (2) twentieth-century progress in formulating theories of status, justice, power, identity, and happiness; and (3) the realization that those theories share a common core of three elements: personal quantitative characteristics, personal qualitative characteristics, and primordial sociobehavioral outcomes.

From there it is straightforward to integrate the theories, building a synthesis in which there are three sociobehavioral forces – status, power, and justice – and their operation generates both identity and happiness. Each turn of the sociobehavioral wheel yields both an identity and a magnitude of happiness. The individual's inner sociobehavioral life can then be characterized by the time series of identities, called the sociobehavioral profile, which is a subset of the happiness profile (happiness arising also from non-sociobehavioral origins, such as music, sunsets, food, and wine). The individual's happiness profile, with its distinctive configuration of valued personal characteristics and sociobehavioral outcomes, of periods of sociobehavioral activity and latency, reveals Aristotle's ways and means of seeking happiness. And the societal constellation of its members' happiness profiles generates distinctive social structures. Thus, individuals may be status-obsessed or power-hungry, wealth-obsessed or beauty-fixated, race-conscious or gender-conscious. And so, too, societies may be materialistic or racialist. As Plato (Republic, Book VIII) puts it, "The States are as the men are: they grow out of human characters."

Of course, the purpose of a theory is "to get nearer to the truth" (Popper 1963:256-246). The new unified theory, and its component theories, constitute, in Popper's (1963:245) apt word,

"guesses" about human behavior. To assess the verisimilitude of the guesses, to "reduce the falsity content ... [and] strengthen their truth content" (Popper 1963:246), two tasks lie ahead. The first is theoretical – deriving Popperian "new predictions" that illuminate the competition between the sociobehavioral forces, the ensuing configuration, and the impacts of the configuration, thus extending the frontier beyond the predictions of the component theories. The second is empirical – testing the derived predictions.

This paper has presented the first statement of the unified theory, and to illustrate the theoretical task, we derived a new set of predictions for emergent attachments to self and subgroup. These predictions indicate that both the sociobehavioral force, the valued quantitative characteristics, and the group's subgroup split profoundly affect the ensuing configuration of Selfistas and Subgroupistas, both within the entire society and within the pre-existing subgroups. For example, when status is the dominant sociobehavioral force, Subgroupistas command a majority in the society, a majority, moreover, which varies with the subgroup split, attaining its low of approximately 57.3% when the disadvantaged subgroup is 70% of the population (Figure 2). However, when justice is the dominant sociobehavioral force, Subgroupistas can be in the majority or in the minority, depending on (1) whether the valued good is cardinal or ordinal, (2) the distributional form of valued cardinal goods, and (3) the subgroup split (Figure 3).

These results also highlight the distinctive challenges faced by the two subgroups – the bottom subgroup has no one who puts the subgroup first, and the top subgroup is undermined by members who put themselves first – as well as the dilemmas associated with harnessing the capabilities of "the best and the brightest" who may tend to put their own interests ahead of the group's. And the results further suggest the social location of individuals who put the group first, and thus the optimal social location of persons to appoint to positions of trust – for example, when a group goal is paramount, the implied rule is to always appoint someone from the bottom subgroup. Another implication is that whistleblowers will be disproportionately drawn from the bottom subgroup.

Many further implications follow. To illustrate, consider nation-building. With every

new set of PSO, valued goods, and groups and pre-existing subgroups, there is a new set of identities and a new social order. Old struggles and hostilities become obsolete. Old organizations and old newspapers die; new ones take their place. This re-shuffling has critical implications for nation-building. For example, a constitution designed to manage a structure in which Subgroupistas dominate and the pre-existing subgroups have a specific representation among the Subgroupistas will be obsolete when Selfistas become dominant or when the composition of pre-existing subgroup origin shifts among the Subgroupistas. The secret of a good constitution is not to fit too closely to today's structure, for tomorrow's structure may differ sharply.

Beyond the special mission of a theory to "get nearer to the truth" (Popper 1963:256-246), the new unified theory of sociobehavioral forces may have a unifying effect on sociology. It is evident that both the theoretical and empirical challenges ahead require contributions from many quarters and of many kinds. Not only does the theory's long reach touch diverse topical domains but also refining the postulates and testing the predictions requires a range of experience, from the intuitive and ethnographic to the mathematical and statistical. In the new unified theory, to paraphrase Samuel Smiles, there is "A place for everything, and a place for everyone."

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Table 1. Basic Quantities in the New Unified Theory of Sociobehavioral Forces and Their Counterparts in the Component Theories

Quantity/ Formula	Component Theories			
	Identity	Sociobehavioral Forces		
		Comparison	Status	Power
Personal Identity $I = I(Quan, Qual, PSO)$	Personal Identity	Comparison Function $Z = \theta \ln\left(\frac{A}{C}\right)$	Status Function $S = \ln\left(\frac{1}{1-\alpha_A}\right)$	Power Function $P = A$
Group Identity $E(I)$	Group Identity (Superordinate-Level)	Group Z $E(Z)$	Group S $E(S)$	Group P $E(P)$
Subgroup Identity $[E(I)]_{catqual}$	Subgroup Identity	Subgroup Z $[E(Z)]_{catqual}$	Subgroup S $[E(S)]_{catqual}$	Subgroup P $[E(P)]_{catqual}$

Notes: The two leftmost columns provide the general expressions and labels for the fundamental quantities in the unified theory – the personal identity, group identity, and subgroup identity. The three rightmost columns provide the corresponding general formulas in the theories of each of the sociobehavioral forces. Subgroup identity is the average personal identity in pre-existing subgroups (i.e., defined by categories of a qualitative characteristic, denoted catqual). Specific forms for personal identity in small groups and large populations and for cardinal and ordinal holdings are presented in Table 2. In the special case of the justice member of the comparison family, the group identity is also known as the first justice index, JI1, and as the social welfare; it is equal to the log of the ratio of the geometric mean of A to the geometric mean of C. In status theory, personal S is also known as S1 and subgroup S is also known as S2; the group S approaches unity as the population size approaches infinity.

Table 2. Specific Formulas for Personal Identity in the New Unified Theory, by Sociobehavioral Force, Cardinal or Ordinal Good, and Small Group or Large Population

Sociobehavioral Forces				
Comparison		Status	Power	
Cardinal Good	Ordinal Good		Cardinal Good	Ordinal Good
A. Small Groups				
$Z = \theta \ln\left(\frac{x_A}{x_C}\right)$	$Z = \theta \ln\left(\frac{i_A}{i_C}\right)$	$S = \ln\left(\frac{N+1}{N+1-i_A}\right)$	$P = \left(\frac{x}{\mu}\right)_A$	$P = \frac{i_A}{N+1}$
B. Large Populations				
$Z = \theta \ln\left(\frac{x_A}{x_C}\right)$	$Z = \theta \ln\left(\frac{\alpha_A}{\alpha_C}\right)$	$S = \ln\left(\frac{1}{1-\alpha_A}\right)$	$P = \left(\frac{x}{\mu}\right)_A$	$P = \alpha_A$

Notes: All formulas are for the case of a good; formulas for bads are straightforwardly derived. Formulas for status and for the ordinal cases of the comparison and power forces are expressed in terms of the raw rank i and the population size N. The subscripts A and C denote the actual and comparison holdings, respectively. While the comparison function is a function of two inputs (the actual and comparison holdings), the status and power functions are functions of a single input (the actual holding). Status theory does not distinguish between cardinal and ordinal characteristics. The comparison outcome Z increases at a decreasing rate with the actual holding (x in the cardinal case, the relative rank α in the ordinal case); status S increases at an increasing rate with the relative rank α; power P increases at a constant rate with the actual holding (the relative amount in the cardinal case, the relative rank α in the ordinal case). Note also that, in the case of cardinal goods, power P may also turn out to be a function of the absolute amount x.

Table 3. Personal Identity, Subgroup Identity, and Group Identity in Heterogeneous Society, by Sociobehavioral Force and Cardinal or Ordinal Good

Good's Distribution	Personal Identity	Subgroup Identity		Group Identity
		Bottom Subgroup	Top Subgroup	
A. Status – Ordinal and Cardinal Valued-Good Regimes				
Rectangular	$\ln\left(\frac{1}{1-\alpha}\right)$	$1+\left(\frac{1-p}{p}\right)\ln(1-p)$	$1-\ln(1-p)$	1
B.1. Justice-Nonmaterialistic – Ordinal Valued-Good Regime				
Rectangular	$\ln(2\alpha)$	$\ln\left(\frac{2}{e}\right)+\ln(p)$	$\ln\left(\frac{2}{e}\right)-\frac{p\ln(p)}{1-p}$	$\ln\left(\frac{2}{e}\right)$
B.2. Justice-Materialistic – Cardinal Valued-Good Regime				
Lognormal	$kQ_N(\alpha)-\frac{k^2}{2}$	$-\frac{k^2}{2}-\frac{kf_N[Q_N(p)]}{p}$	$-\frac{k^2}{2}+\frac{kf_N[Q_N(p)]}{1-p}$	$-\frac{k^2}{2}$
Pareto	$\ln\left[\frac{(k-1)}{k(1-\alpha)^{1/k}}\right]$	$\ln\left(\frac{k-1}{k}\right)+\frac{1}{k}+\frac{(1-p)\ln(1-p)}{kp}$	$\ln\left(\frac{k-1}{k}\right)+\frac{1}{k}-\frac{\ln(1-p)}{k}$	$\ln\left(\frac{k-1}{k}\right)+\frac{1}{k}$
Power-Function	$\ln\left[\frac{(k+1)\alpha^{1/k}}{k}\right]$	$\ln\left(\frac{k+1}{k}\right)-\frac{1}{k}+\frac{\ln(p)}{k}$	$\ln\left(\frac{k+1}{k}\right)-\frac{1}{k}-\frac{p\ln(p)}{k(1-p)}$	$\ln\left(\frac{k+1}{k}\right)-\frac{1}{k}$

C.1. Power-Nonmaterialistic – Ordinal Valued-Good Regime				
Rectangular	α	$\frac{p}{2}$	$\frac{1+p}{2}$	.5
C.2. Power-Materialistic – Cardinal Valued-Good Regime				
Lognormal	$\exp\left[k\,Q_{\mathrm{N}}(\alpha) - \frac{k^2}{2}\right]$	$\frac{1}{p}\left\{F_{\mathrm{N}}\left[Q_{\mathrm{N}}(p) - k\right]\right\}$	$\frac{1}{1-p}\left\{1 - F_{\mathrm{N}}\left[Q_{\mathrm{N}}(p) - k\right]\right\}$	1
Pareto	$\frac{(k-1)}{k(1-\alpha)^{1/k}}$	$\frac{1-(1-p)^{\frac{k-1}{k}}}{p}$	$(1-p)^{-\frac{1}{k}}$	1
Power-Function	$\frac{(k+1)\alpha^{1/k}}{k}$	$p^{\frac{1}{k}}$	$\frac{1-\left(p^{\frac{k+1}{k}}\right)}{1-p}$	1

Notes: Personal identity is expressed via the quantile function, that is, as a function of relative rank. Subgroup identity is the average personal identity in pre-existing subgroups. Group identity is the average personal identity in the entire group. The individual's relative rank is denoted by α and the subgroup split (i.e., the proportion in the bottom subgroup) by p. The parameter k is the distribution's general inequality parameter (Jasso and Kotz in press). The terms $f_N(\cdot)$ and $Q_N(\cdot)$ denote the probability density function and the quantile function, respectively, of the unit normal variate.

Table 4. General Results on Preference Orderings, Unanimity, and Coalitions, by Relative Location of Subgroup Boundary and Intersection Between Personal Identity and Group Identity

Relative Location, Boundary and Intersection of *I* and *E(I)*	Preference Orderings			Unanimity		Coalitions					
						2-Way Contest			3-Way Contest		
						Weak			Weak		Strong
	Total Num	Number in Bottom	Number in Top	Bottom	Top	Self vs Group	Self vs Subgroup	Subgroup vs Group	Same 1st or 2nd	Same 2nd	Same 1st
Coincide	4	2	2	Groupista first	Groupista last	None	Self Sub	None	Self Sub	Self Sub	None
Boundary below	5	2	3	Groupista first	None	Group	Self Sub	None	Self Sub Group	Self Sub	None
Boundary above	5	3	2	None	Groupista last	Self	Self Sub	None	Self	Self Sub	Self

Notes: Abbreviations: Self = Selfista; Sub = Subgroupista; Group = Groupista.

Table 5. Proportion of the Population in Each Preference Ordering, by Subgroup Boundary and Subgroup: Status Force

Subgroup Boundary	Bottom Subgroup			Top Subgroup		
	Group> Subgroup> Personal	Group> Personal> Subgroup	Personal> Group> Subgroup	Subgroup> Group> Personal	Subgroup> Personal> Group	Personal> Subgroup> Group
.05	.0251	.0249	0	.582	.0184	.349
.10	.0504	.0496	0	.532	.0368	.331
.15	.0760	.0740	0	.482	.0552	.313
.20	.102	.0981	0	.432	.0736	.294
.25	.128	.122	0	.382	.0920	.276
.30	.154	.146	0	.332	.110	.258
.35	.181	.169	0	.282	.129	.239
.40	.208	.192	0	.232	.147	.221
.45	.236	.214	0	.182	.166	.202
.50	.264	.236	0	.132	.184	.184
.55	.293	.257	0	.082	.202	.166
.60	.322	.278	0	.0321	.221	.147
.632	.342	.290	0	0	.233	.135
.65	.353	.280	.0179	0	.221	.129
.70	.384	.248	.0679	0	.190	.110
.75	.416	.216	.118	0	.158	.0920
.80	.450	.182	.168	0	.126	.0736
.85	.486	.146	.218	0	.0948	.0552
.90	.525	.107	.268	0	.0632	.0368
.95	.569	.028	.318	0	.0316	.0184

Notes: Average status in the entire group equals 1. The relative rank at which personal status equals group status is $[1 - 1/e]$, or approximately .632. The proportions in each row sum to 1.

Table 6. Proportion of Each Subgroup in Each Preference Ordering, by Subgroup Boundary and Subgroup: Status Force

Subgroup Boundary	Bottom Subgroup			Top Subgroup		
	Group> Subgroup> Personal	Group> Personal> Subgroup	Personal> Group> Subgroup	Subgroup> Group> Personal	Subgroup> Personal> Group	Personal> Subgroup> Group
.05	.502	.498	0	.613	.0194	.368
.10	.504	.496	0	.591	.0409	.368
.15	.507	.0493	0	.567	.0649	.368
.20	.509	.491	0	.540	.0920	.368
.25	.512	.488	0	.509	.0123	.368
.30	.515	.485	0	.474	.158	.368
.35	.518	.482	0	.434	.198	.368
.40	.521	.479	0	.387	.245	.368
.45	.525	.475	0	.331	.301	.368
.50	.528	.472	0	.264	.368	.368
.55	.533	.467	0	.182	.450	.368
.60	.537	.463	0	.0803	.552	.368
.632	.342	.290	0	0	.632	.368
.65	.542	.430	.0275	0	.632	.368
.70	.548	.355	.0970	0	.632	.368
.75	.555	.288	.157	0	.632	.368
.80	.562	.228	.210	0	.632	.368
.85	.572	.172	.256	0	.632	.368
.90	.583	.119	.298	0	.632	.368
.95	.599	.0661	.335	0	.632	.368

Notes: Average status in the entire group equals 1. The relative rank at which personal status equals group status is $[1 - 1/e]$, or approximately .632. The proportions within each subgroup in each row sum to 1.

Table 7. Proportions with Selfista, Subgroupista, or Groupista First Choice, by Subgroup Boundary and Subgroup: Status Force

Subgroup Split	Groupista		Subgroupista		Selfista	
	Bottom Subgroup	Top Subgroup	Bottom Subgroup	Top Subgroup	Bottom Subgroup	Top Subgroup
.05	.05	0	0	.6005	0	.3495
.10	.10	0	0	.569	0	.331
.15	.15	0	0	.537	0	.313
.20	.20	0	0	.506	0	.294
.25	.25	0	0	.474	0	.276
.30	.30	0	0	.443	0	.257
.35	.35	0	0	.411	0	.239
.40	.40	0	0	.379	0	.221
.45	.45	0	0	.348	0	.202
.50	.50	0	0	.316	0	.184
.55	.55	0	0	.285	0	.165
.60	.60	0	0	.253	0	.147
.632	.632	0	0	.232	0	.136
.65	.632	0	0	.221	.0179	.129
.70	.632	0	0	.190	.0679	.110
.75	.632	0	0	.158	.118	.0920
.80	.632	0	0	.126	.168	.0736
.85	.632	0	0	.0948	.218	.0552
.90	.632	0	0	.0632	.268	.0368
.95	.632	0	0	.0316	.318	.0184

Notes: The proportions in each row sum to 1.

Table 8. Proportions Selfista and Subgroupista, by Subgroup Boundary and Subgroup: Status Force

Subgroup Boundary	Subgroupista		Selfista	
	Bottom Subgroup	Top Subgroup	Bottom Subgroup	Top Subgroup
.05	.0251	.600	.0249	.349
.10	.0504	.569	.0496	.331
.15	.0760	.537	.0740	.313
.20	.102	.506	.0981	.294
.25	.128	.474	.122	.276
.30	.154	.442	.146	.258
.35	.181	.411	.169	.239
.40	.208	.379	.192	.221
.45	.236	.348	.214	.202
.50	.264	.316	.236	.184
.55	.293	.284	.257	.166
.60	.322	.253	.278	.147
.632	.342	.233	.290	.135
.65	.353	.221	.298	.129
.70	.384	.190	.316	.110
.75	.416	.158	.334	.0920
.80	.450	.126	.350	.0736
.85	.486	.0948	.364	.0552
.90	.525	.0632	.375	.0368
.95	.569	.0316	.346	.0184

Notes: The proportions in each row sum to 1.

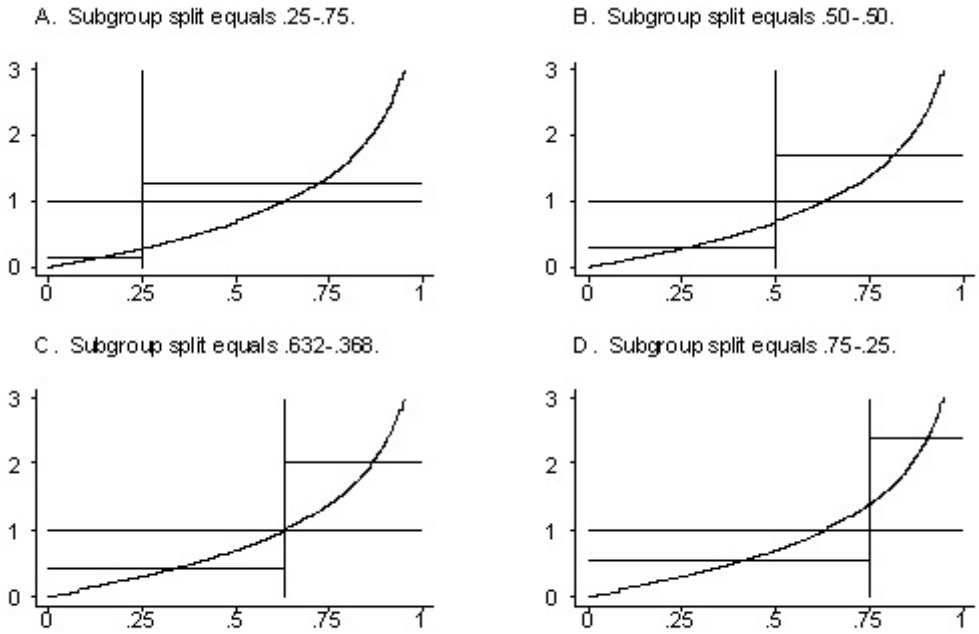

Figure 1. Personal, Subgroup, and Group Status, by Subgroup Split

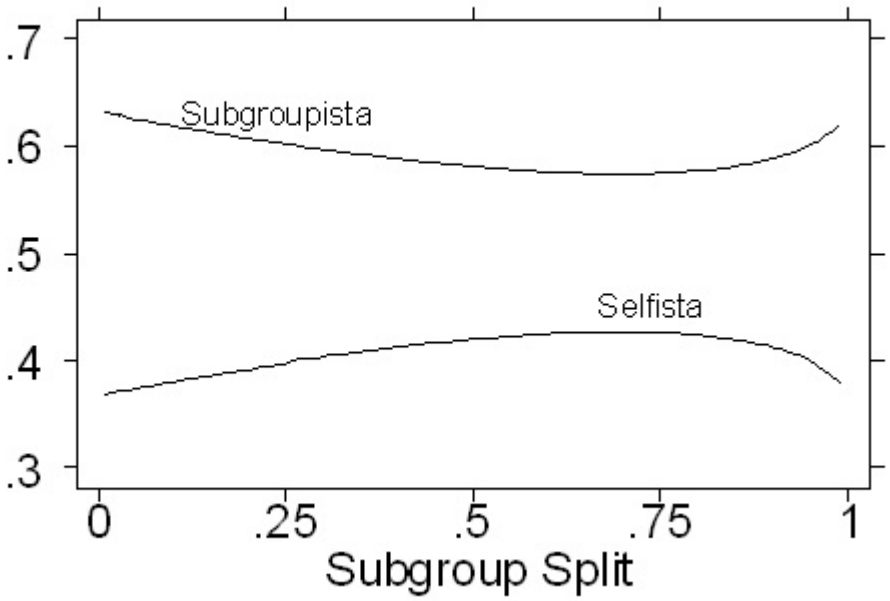

Figure 2. Proportions Selfista and Subgroupista in Two-Way Contest, by Subgroup Split: Status Force. Proportions Selfista and Subgroupista sum to 1.

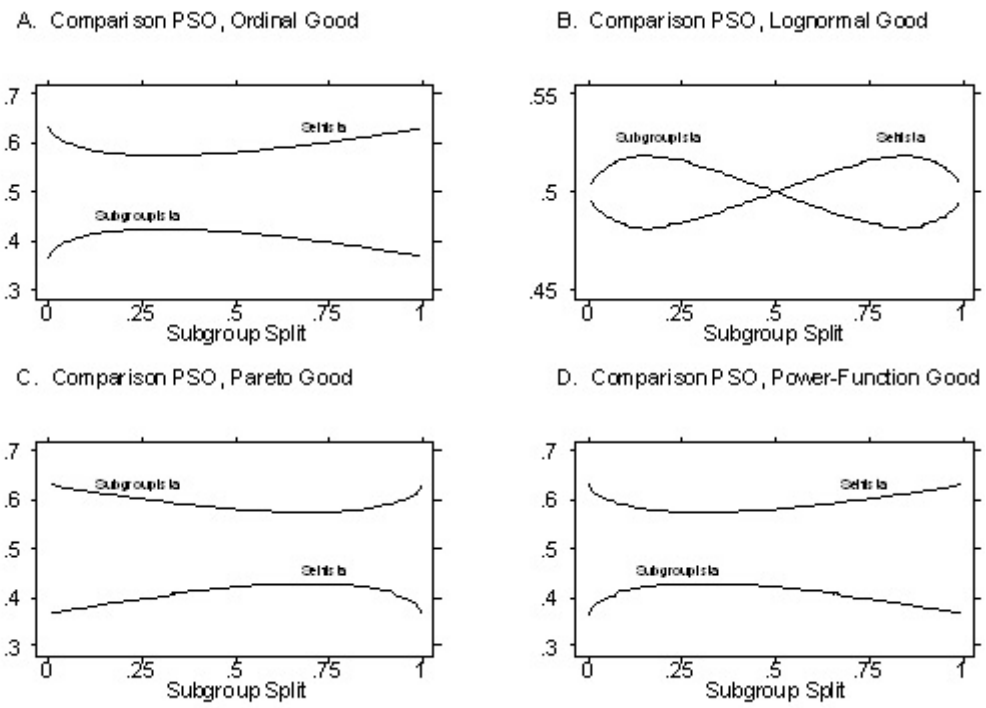

Figure 3. Proportions Selfista and Subgroupista in Two-Way Contest, by Subgroup Split: Comparison Force, Ordinal Good and Three Distributions of Cardinal Goods. Proportions Selfista and Subgroupista sum to 1.