

CHAPTER 30

Comparison Theory

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INTRODUCTION

Comparison theory was born in 1988. It was born with the realization that the justice evaluation function, which in the previous decade had become a useful starting postulate for justice theory, is a special case of a substantially more general function—the comparison function—and therefore large portions of the justice theory apparatus can be put in the service of the larger set of comparison processes.

The basic idea underlying comparison theory—that humans compare themselves to others and/or to previous or envisioned selves, and thereby experience happiness, well-being, self-esteem, and the sense of justice—of course, is not new. This idea, which is at least as old as recorded history, has figured prominently in social thought, philosophy, and social science from *Genesis* to Benjamin Franklin, from classical Greek and Roman authors (especially Epictetus and the Spanish Romans, Marcus Aurelius and Seneca), to the pioneering 19th-century social scientists Marx (1849/1968), Baldwin (1899–1891), Durkheim (1893/1951, 1897/1964), and William James (1891/1952). For example, the first recorded social event in Judaeo-Christian literature (postcreation) involves a comparison (“if you eat this, you will be like gods, knowing good from evil”). After the fall, the next recorded social events are conjugal relations and a new comparison (Cain compares his reward to Abel’s, and as a result kills him).

In the middle decades of the 20th century, comparison ideas spawned sparkling advances in social science, notably in the work of Stouffer et al. (1949), Merton and Rossi (1950), Festinger (1954), Thibaut and Kelley (1959), Merton (1957), Runciman (1961), Homans (1974), Wright (1963), Blau (1964), Hyman (1968), Lipset (1968), Sherif (1968), Zelditch (1968), and Berger, Zelditch, Anderson, and Cohen (1972). Across these decades, a shift began to occur, which was to prove enormously consequential. This was the shift from the formulation,

Humans compare themselves to others or to previous or envisioned selves,

to a revised formulation highlighting persons’ *holdings of goods* rather than *persons themselves*,

Humans compare their holdings of goods to others’ or their own previous or envisioned holdings of goods,

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and finally to a formulation that deletes persons altogether from the comparison holding,

Humans compare their actual levels of attributes and amounts of possessions to the levels/amounts expected or desired or thought just or appropriate.

This shift would enable rigorous formalization of the basic comparison idea, and the new comparison function, embedded in the short postulate set inherited from justice theory, would in turn yield a wealth of implications. The implications would go far beyond the expected territory, to the larger world of phenomena and processes previously thought to reside, unconnected, in separate domains. Most would not even have the word “compare” in them. They would appear at every level of analysis, from individuals to dyads, small groups to large societies. They would include intuitive and counterintuitive implications, quantitative and qualitative implications. They would suggest the existence of fundamental constants. They would provide theoretical foundation for new measurement procedures. They would provide interpretations for rare events.

Today comparison theory is a robustly growing theory, with an abundance of implications making their way into the empirical trenches. It satisfies the theoretical criteria for a good theory: its few postulates yield a large and growing set of implications, including novel predictions. However, it is empirical test that will decide its validity, that will set limits to its applicability, suggest revisions, perhaps reject it. Comparison theory in the 21st century may grow more beautiful, its postulate set more spartan, and its prediction set more abundant; or it may disappear, giving way to more fundamental theories with greater explanatory power, leaving behind only the happy memory of a theoretical life well lived and substantial experience with the tools that will enable swift progress with the new theories.

This chapter provides an overview of comparison theory, describing its postulate set, summarizing the micromodel and macromodel methods for deriving predictions, and listing a few of the predictions derived to date. Though generating testable predictions is a theory’s first purpose, comparison theory also does some of the other things that a good theory does—suggest the existence of fundamental constants, provide a foundation for measurement, provide interpretation for rare or nonrecurring events—and these are briefly discussed. The chapter concludes with a set of frequently asked questions (FAQs).

The order to be followed, however, departs from the logical order in one respect. The overview begins with a sampling of predictions, rather than proceeding systematically from the postulates to the derivation methods to the predictions. The reason is that a major purpose of this chapter is to invite the reader to work in comparison theory. The implications are sufficiently wide-ranging, and some of them novel, that they pique the reader’s curiosity in a way that parallels the theorist’s surprise: How could this sparse set of assumptions yield such predictions? Moreover, as spectacularly exciting as the comparison function may appear to someone already working with it, to a newcomer it may seem little more than the old idea it is underneath the formalization. What is new is that this old idea, which we knew from our own experience before we learned it in graduate school, can be made to surrender its secrets, to reveal how far its reach extends.

SOME PREDICTIONS OF COMPARISON THEORY

Comparison theory yields predictions for virtually every area of the human experience. The predictions are testable, *ceteris paribus*, predictions. This section presents a sampling of the predictions of comparison theory, grouped by topical domain.

Note that many of the predictions derived from comparison theory pertain to two or more topical domains; for example, they may connect family behavior with health and with grief. In the listing that follows, to save space, we list each prediction in only one topical group (somewhat arbitrarily chosen) and we make no attempt to cross-reference them. If this were a comprehensive inventory of the theory's predictions, it would be important to cross-reference them completely. Here, however, our main purpose is to provide a flavor for the variety of topical areas touched by comparison processes.

Note also that although each prediction embodies a relationship that can be generated by many processes, the predictions share the feature that the comparison impulse plays a part in all of them.

Death

John Donne's (1923/1959) poem, "No Man Is an Island" (*Devotions XVII*), occupies a special place in English-language literature. The following lines are often quoted:

Any man's death diminishes me,
Because I am involved in mankind;
And therefore never send to know for whom the bell tolls;
It tolls for thee.

Thus, it was a surprise when, in the course of using micromodel procedures to derive implications from comparison theory for disaster phenomena, the following prediction popped up:

- *Prediction (Death and Grief)*: In a disaster, if there is no property loss but at least one death, then everyone experiences a loss in well-being.

Inheritance

In the novel *Don Quixote* (Cervantes, 1605, 1615/1968), as Don Quixote lies dying and all around are weeping uncontrollably, he summons the notary and, dictating his will, makes bequests to his niece, to the housekeeper, and to Sancho Panza (Part II, Chapter 74). Don Quixote lived for 3 more days and during this time,

The house was all in confusion; but still the niece ate and the housekeeper drank and Sancho Panza enjoyed himself; for inheriting property wipes out or softens down in the heir the feeling of grief the dead man might be expected to leave behind him. (Cervantes, 1605, 1615/1952, p. 429)

Again, it was a surprise to notice, among the implications obtained in an application of comparison theory to gifts and bequests, the prediction:

- *Prediction (Inheritance and Grief)*: Inheritance tempers grief.

This implication in turn engenders a large set of special cases, including:

- *Prediction (Grief and Death of a Child)*: The death of an offspring is mourned more than the death of a parent.
- *Prediction (Grief and Death of a Parent)*: Under the condition that the parent who dies first leaves his estate to the surviving spouse, the parent who dies first is mourned more than the other parent. Thus, in historical epochs when wives predecease their husbands (as when death in childbirth is prevalent), mothers are mourned more than fathers, but when husbands predecease their wives (as when war is endemic), fathers are mourned more than mothers.

Gifts

There are two main occasions when parents give gifts to their children: at the children's birthdays and at some annual gift giving occasion, such as Christmas or Hanukkah or the Feast of the Three Kings. How do parents allocate their toy budget? More generally, how does gift giving operate? Comparison theory yields many implications about gift giving, including the following three (one of which echoes Virgil):

- *Prediction (Parental Giftgiving)*: Under the condition that parents love their children, parents of nontwin children will spend more of their toy budget at an annual gift giving occasion rather than at the children's birthdays.
- *Prediction (Rules against Gifts)*: Groups make rules restricting gifts from outsiders.
- *Prediction (Gifts and Greeks)*: Beware of Greeks bearing gifts.¹

Theft

Theft appears to be a universal feature of human experience. It appears early in *Genesis*, for example, with Jacob's theft of Esau's birthright. Comparison theory yields a large set of theft predictions, including the following:

- *Prediction (Thief's Gain and Insider/Outsider Theft)*: A thief's gain from theft is greater when stealing from a fellow group member than when stealing from an outsider.
- *Prediction (Thief's Gain, Insider/Outsider Theft, and Group Wealth)*: A thief's extra gain when stealing from a fellow group member rather than from an outsider is larger in poor groups than in rich groups.
- *Prediction (Cross-Group Theft and Interpersonal Affinities)*: In cross-group theft, there are natural affinities (1) between thief and members of victim's group, and (2) between victim and members of thief's group.
- *Prediction (Theft and Society)*: Society loses when rich steal from poor.

Birth, Wealth, and Virtue

The decision whether to value birth, wealth, or virtue constitutes both a fundamental individual decision and a fundamental societal-organizing principle. Discussions abound in history, philosophy, social thought, literature, and the daily press. Don Quixote spends the better part of the novel lecturing Sancho Panza, who seeks wealth, on the superiority of virtue and heroic deeds. In contrast, an argument can be made, based on the reasonings of Veblen (1899/1953), Weber (1904–1905/1958), Rainwater (1974), and Rosenberg and Pearlin (1978), that cardinal goods are always the default valued goods because they are simpler to measure and the mind is drawn to simple mathematical solutions (Jasso 1983, 1987).²

Early in the development of justice theory, it became clear that it would be necessary to distinguish between cardinal goods, like wealth, and ordinal goods, like birth, beauty, athletic

¹Or, as in the *Aeneid*, Book II, l. 49. "*Quidquid id est, timeo Danaos et dona ferentis.*"

²Whether to value beauty, wealth, athletic skills, or virtue is a common topic in the daily press. Recent stories in *The New York Times*, for example, suggest that the valued good is wealth in Silicon Valley, beauty in Florida, and varies widely across schools.

skill, attractiveness, and so on. It also became clear that the characteristics we call virtues are ordinal goods, and therefore would not be distinguished in their operation from other nonvirtue ordinal goods. However, the distinction between cardinal and ordinal goods would be profound and would lead to important implications for the differential consequences of living in materialistic and nonmaterialistic societies. Some of these implications are:

- *Prediction (Overreward and Materialism)*: The most advantaged person in a materialistic society is happier than the most advantaged person in a nonmaterialistic society.
- *Prediction (Marital Happiness and Materialism)*: Marital happiness can achieve higher levels in materialistic societies than in nonmaterialistic societies.
- *Prediction (Happiness and Group Size in Nonmaterialistic Societies)*: In societies that value ordinal goods, the larger the group, the lower the average happiness.
- *Prediction (Conflict and Materialism)*: Given a conflict between the two subgroups of a two-subgroup society, in nonmaterialistic societies conflict severity decreases as the size of the lower subgroup increases, but in materialistic societies, the direction of the effect of subgroup size on conflict severity depends on the shape of the income distribution.
- *Prediction (Religious Institutions and Materialism)*: The salutary effect of religious institutions on the “world” differs systematically across materialistic and nonmaterialistic societies.

Marriage and Divorce

Most people marry and many people divorce. It thus is of interest whether comparison processes play a part in marital phenomena. It turns out that comparison theory yields many implications for marital phenomena, including the following:

- *Prediction (Employment and Marital Cohesiveness)*: The effects of employment, unemployment, and retirement depend on the spouses' earnings ratio.
- *Prediction (Opposite Effects on Individual Well-being and Marital Cohesiveness)*: Shifts that increase marital cohesiveness increase the well-being of one spouse but decrease the other's.
- *Prediction (Grief from Widowhood and Divorce)*: Losing a beloved spouse to death is less painful than losing a beloved spouse to divorce.

Health

Anecdotal accounts suggest the effects of comparison processes on physical and mental health. Comparison theory yields the following implications:

- *Prediction (Eating Disorders and Blindness)*: Blind persons are less vulnerable to eating disorders such as anorexia than are persons with sight.
- *Prediction (Disasters and Euphoria)*: In a disaster, if there is property loss but no deaths, nonvictims experience euphoria.

Conversation

Talk pervades the social life. Here, too, we see the hand of comparison processes, as in the following implications:

- *Prediction (Conversation Topics and Valued Goods)*: The topics raised in conversation signal the speaker's valued good(s). A prime example is that of a hereditary monarch discussing horse bloodlines.
- *Prediction (Interruptions and Valued Goods)*: The number of interruptions in a group depends on (1) the number of potential valued goods, (2) inequality in the distribution of cardinal goods, and (3) intercorrelations among the valued goods.
- *Prediction (Interruptions and Groups)*: Interruptions are group-specific; a given actor may interrupt repeatedly in one group, never in another.
- *Prediction (Courtesy in the City)*: Courtesy is lower in heterogeneous societies, and thus in urban settings.

Immigration

An interesting question in comparative social policy concerns the variability in immigration policies. Why do some societies welcome immigration and others not? Comparison theory yields a pertinent prediction:

- *Prediction (Immigration and Materialism)*: Societies that welcome immigration must be societies that value wealth.

Groups and the Changing Value of Things

All social scientists—but perhaps especially sociologists—assume that groups and group structure exert fundamental influence over individuals. The implications of comparison theory include the following:

- *Prediction (Groups and the Value of Things)*: A thing changes value as it, or its owner, moves from group to group.
- *Prediction (Gift's Value and Giver's Presence)*: A gift is more valuable to the receiver when the giver is present.
- *Prediction (Theft of a Gift)*: In an experiment, if a thing is given by the experimenter to a subject and subsequently stolen by a fellow participant, the loss from theft exceeds the gain from the gift.

International Relations

Some predictions apply to relations between countries. These include the following:

- *Prediction (Bilateral Migration Policy)*: In international migration, if origin and destination countries have equal wealth, they cannot both favor or both oppose migration; they can only both be indifferent to it.
- *Prediction (How to Punish a Foe)*: To punish a foe, kill its best people or send it your worst people.
- *Prediction (How to Incapacitate a Foe)*: To incapacitate a foe, kill its children.

War

The topic of international relations leads naturally to the topic of war. Some of the implications of comparison theory for war-related phenomena are:

- *Prediction (War and Games of Chance)*: In wartime, the favorite leisure-time activity of soldiers is playing games of chance.
- *Prediction (War and Gifts)*: Gift giving increases in wartime.
- *Prediction (War and Posttraumatic Stress)*: Posttraumatic stress is greater among veterans of wars fought away from home than among veterans of wars fought on home soil.

Inequality

Not surprisingly, given the strong links between comparison theory and justice theory, comparison theory yields implications about the social consequences of economic inequality. Some of these implications are:

- *Prediction (Conflict Severity and Economic Inequality)*: In materialistic societies, conflict severity is an increasing function of economic inequality.
- *Prediction (Emigration and Economic Inequality)*: In materialistic societies, the proportion of the population at risk of emigrating is an increasing function of economic inequality.

THE POSTULATES OF COMPARISON THEORY

The predictions reported in the previous section were deduced from the postulates of comparison theory. In this section we take a look at those postulates.

Individual-Level Postulates

COMPARISON FUNCTION. A theory begins with an assumption. Comparison theory begins with the assumption that humans compare the amounts or levels of their holdings of goods and bads to the amounts or levels they desire or expect or think appropriate (henceforth, simply “comparison holding”), thereby experiencing happiness, well-being, self-esteem, and the sense of justice. This assumption is represented by the comparison function, which specifies the comparison outcome (say, happiness or self-esteem), denoted Z , as the natural logarithm of the ratio of the actual holding, denoted A , to the comparison holding, denoted C .

- *Postulate 1 (Logarithmic Specification of Comparison Function)*: The comparison outcome varies with the logarithm of the ratio of the actual holding to the comparison holding,

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

where θ is the signature constant, whose sign is positive for goods and negative for bads.³

³The absolute value of the signature constant measures the individual’s expressiveness and is known as the expressiveness coefficient. Expressiveness plays an important part in empirical work. However, it has not played a part in the

TABLE 30.1. Mathematical Statement of Key Properties of the Comparison Function

1. *Additivity.* The function $Z = Z(A,C)$ is said to be additive if and only if the effect of A on Z is independent of C and the effect of C on Z is independent of A :

$$Z_{AC} = 0$$

2. *Scale Invariance.* The function $Z = Z(A,C)$ is said to be scale invariant if and only if it is homogeneous of degree zero:

$$AZ_A + CZ_C = 0$$

3. *Symmetry.* The function $Z = Z(A,C)$ is said to be symmetric if and only if it satisfies the condition:

$$Z(A,C) = -Z(A,C)$$

4. *Deficiency Is Felt More Keenly than Comparable Excess.* The function $Z = Z(A,C)$ is said to satisfy the property that deficiency is felt more keenly than comparable excess if and only if it satisfies the condition:

$$|Z_{(A=C_0-k)}| > Z_{(A=C_0+k)}$$

where C_0 is the comparison reward and k is a positive constant.

According to the comparison function, the Z outcomes assume values of zero when the actual holding equals the comparison holding, negative values when the actual holding is less than the comparison holding, and positive values when the actual holding exceeds the comparison holding. Thus, for example, the happiness dimension is represented by the full real-number line, with zero a neutral point, degrees of happiness represented by positive numbers, and degrees of unhappiness by negative numbers.

The logarithmic-ratio specification of the comparison function has several properties desirable in a comparison function; these are summarized in Table 30.1. For example, it quantifies the common human experience that deficiency is felt more keenly than comparable excess. Moreover, in the case of cardinal goods and bads, it is the only functional form that satisfies both scale-invariance and additivity.⁴

MEASUREMENT RULE FOR HOLDINGS. The logarithmic specification initially was proposed for cardinal things; it is easy to measure the actual and comparison holdings of, say, money or hectares of land. But the literature and everyday experience suggest that goods and bads not susceptible of cardinal measurement (beauty, intelligence, athletic skill, heroism) also play important parts in comparison processes. Therefore, the second postulate proposes a measurement rule (Jasso, 1980):

- *Postulate 2 (Measurement Rule):* Cardinal goods and bads are measured in their own units (the amount denoted by x), and ordinal goods and bads are measured by the individual's relative rank $[i/(N + 1)]$ within a specially selected comparison group, where i denotes the rank-order statistic in ascending order and N denotes the size of the group or population:

$$A,C \begin{cases} x, & \text{cardinal holding} \\ \frac{i}{N+1}, & \text{ordinal holding} \end{cases} \quad (2)$$

development of comparison theory to date. Accordingly, in this chapter, the signature constant is fixed at +1 for goods and -1 for bads.

⁴For fuller exposition of the comparison function and its roots in the justice evaluation function, see the original report of the justice evaluation function (Jasso, 1978) and the generalization to the comparison function (Jasso, 1990), as well as the further analysis in Jasso (1996b, 1999).

IDENTITY REPRESENTATION OF COMPARISON HOLDING. A substantial portion of theoretical derivation in comparison theory involves drawing out the implications of changes or differences in individuals’ actual rewards and societal distributions of actual rewards. Such derivation was hampered by the absence of information about individuals’ comparison holdings. The third postulate makes it possible to carry out theoretical derivation even without any knowledge about the comparison holdings and to do so without imposing any additional assumption about how individuals form their notions of the comparison holding (Jasso, 1986).

- *Postulate 3 (Identity Representation of Comparison Holding):* The comparison holding C is identically equal to, and can be expressed as, the product of the arithmetic mean of the actual reward in the collectivity and an individual-specific constant, denoted Φ , which captures everything that is unknown about how the individual chooses his/her own comparison holding:

$$C = \Phi E(A) \tag{3}$$

Because the arithmetic mean is itself equal to the total sum (S) of a thing divided by the population size (N), the comparison reward in the case of a cardinal reward can be written:

$$C = \Phi E(A) = \Phi S/N \tag{4}$$

Thus, the identity representation provides a way to incorporate into the basic comparison function two important factors: the group affluence S and the group size N .

The foregoing three individual-level postulates form the heart of the postulate set of comparison theory. For easy reference, they are summarized in panel A of Table 30.2.

BASIC COMPARISON FUNCTION FORMULAS. Combining the three postulates yields the basic comparison formulas, which express the comparison function for cardinal and ordinal holdings and which can be written in versions for small groups and large collectivities (the “small”-groups formulas include the population size N ; the large-collectivities formulas are

TABLE 30.2. Fundamental Postulates of Comparison Theory

A. Individual-Level Postulates

1. Postulate of Logarithmic Specification of the Comparison Function

$$Z = \theta \ln \left(\frac{A}{C} \right)$$

2. Measurement Rule for Holdings

$$A, C \begin{cases} x, & \text{cardinal good/bad} \\ \frac{i}{N+1}, & \text{ordinal good/bad} \end{cases}$$

3. Identity Representation of Comparison Holding

$$C = \Phi E(A)$$

B. Social-Level Postulates

4. Social Welfare

$$SW = E(Z)$$

5. Social Cohesiveness

$$\text{Social Cohesiveness} = -GMD(Z)$$

NOTES: As described in the text, Z denotes the comparison outcome, A the actual reward, and C the just reward. The signature constant θ is positive for goods and negative for bads. For both actual and just rewards, x denotes the amount of a cardinal good or bad, i denotes the rank-order statistics arranged in ascending order, and N denotes the population size. Φ denotes the individual-specific parameter, $E(\cdot)$ the expected value, and $GMD(\cdot)$ the Gini’s mean difference.

TABLE 30.3. Fundamental Formulas of Comparison Theory

A. Comparison Function

1. When the Comparison Reward Is Known

Small Groups	Large Groups
$Z = \begin{cases} \theta \ln \frac{x_A}{x_C}, & \text{cardinal holding} \\ \theta \ln \frac{i_A}{i_C}, & \text{ordinal holding} \end{cases}$	$Z = \begin{cases} \theta \ln \frac{x_A}{x_C}, & \text{cardinal holding} \\ \theta \ln \frac{\alpha_A}{\alpha_C}, & \text{ordinal holding} \end{cases}$

2. When the Comparison Reward Is Unknown

Small Groups	Large Groups
$Z = \begin{cases} \theta \ln \frac{xN}{\phi S}, & \text{cardinal holding} \\ \theta \ln \frac{2i}{\phi(N+1)}, & \text{ordinal holding} \end{cases}$	$Z = \begin{cases} \theta \ln \frac{x}{\phi E(X)}, & \text{cardinal holding} \\ \theta \ln \frac{2\alpha}{\phi}, & \text{ordinal holding} \end{cases}$

B. Social Welfare Function

1. When the Comparison Reward Is Known

Small Groups	Large Groups
$E(Z) = \begin{cases} \theta \ln \frac{G(X_A)}{G(X_C)}, & \text{cardinal holding} \\ \theta \ln \frac{G(i_A)}{G(i_C)}, & \text{ordinal holding} \end{cases}$	$E(Z) = \begin{cases} \theta \ln \frac{G(X_A)}{G(X_C)}, & \text{cardinal holding} \\ \theta \ln \frac{G(\alpha_A)}{G(\alpha_C)}, & \text{ordinal holding} \end{cases}$

2. When the Comparison Reward Is Unknown

Small Groups	Large Groups
$E(Z) = \begin{cases} \theta \ln \frac{G(X_A)}{E(X_A)} - \theta \ln [G(\phi)], & \text{cardinal holding} \\ \theta \ln \frac{\sqrt[N]{N!}}{N+1} - \theta \ln [G(\phi)], & \text{ordinal holding} \end{cases}$	$E(Z) = \begin{cases} \theta \ln \frac{G(X_A)}{E(X_A)} - \theta \ln [G(\phi)], & \text{cardinal holding} \\ \theta \ln \frac{2}{e} - \theta \ln [G(\phi)], & \text{ordinal holding} \end{cases}$

NOTES: The relative rank is denoted α . The letter S denotes the total amount of the cardinal good(bad). $G(\cdot)$ denotes the geometric mean.

the limiting case as N goes to infinity). Formulas for the case in which the comparison reward is known (subpanel 1) are based on postulates 1 and 2; formulas for the case in which the comparison reward is unknown (subpanel 2) are based on postulates 1, 2, and 3. The formulas are presented in panel A of Table 30.3.

To save space we do not discuss all the formulas, illustrating with only one: the formula for the comparison function for cardinal holdings in small groups when the comparison reward is unknown (Table 30.3, panel A.2, left column, top branch):

$$Z = \theta \ln \left(\frac{xN}{S\phi} \right) \tag{5}$$

Note that in this case the comparison outcome is expressed as a function of the individual's own holding x , the group size N , and the group's total amount S of the holding. Note, moreover, that the logarithmic form enables separating the effects of all factors, thus yielding predictions about the *ceteris paribus* effects of the individual's actual holding and the group size and group affluence, net of the individual's idiosyncrasy parameter ϕ . This particular formula is the starting point for one of the major techniques for deriving predictions, known as the *micro-*

model. The micromodel is used to investigate the effects of change in one or more of the three factors in the comparison function, thus enabling derivation of implications for a wide variety of situations involving change in own holding or group affluence or size (such as situations involving gifts, bequests, disasters, war, and so on).

Social-Level Postulates

An early insight in justice theory was that a society can be represented by the distribution of justice evaluations among its members and that parameters of this distribution may be importantly related to behavioral and social phenomena (Jasso, 1980). Comparison theory inherited this insight, and like justice theory highlights two parameters of the distribution of comparison outcomes—the expected value (or arithmetic mean) and the Gini’s mean difference—forming two postulates around them. As will be seen below, a major technique for deriving implications, known as the *macromodel*, takes the comparison distribution for its starting point.

- *Postulate 4 (Social Welfare)*: The collectivity’s social welfare SW varies with the expected value of the Z distribution:

$$SW = E(Z) \quad (6)$$

The social welfare postulate plays a part in some of the implications derived using macromodel procedures. Formulas for the social welfare function for both cardinal and ordinal holdings, in versions for small groups and large collectivities (where, as before, the “small”-groups formulas include the population size N , and the large-collectivities formulas are the limiting case as N goes to infinity), are reported in panel B of Table 30.3. As with the formulas for the comparison function, formulas for the case in which the comparison reward is known (subpanel 1) are based on postulates 1 and 2; formulas for the case in which the comparison reward is unknown (subpanel 2) are based on postulates 1, 2, and 3. Note that the social welfare is the same as the quantity that in justice analysis is known as the justice index (Jasso, 1999).

- *Postulate 5 (Social Cohesiveness)*: The collectivity’s social cohesiveness SC varies with the Gini’s mean difference of the Z distribution:

$$\text{Social Cohesiveness} = -GMD(Z) \quad (7)$$

TWO TECHNIQUES FOR THEORETICAL DERIVATION

The second section presented a sampling of predictions of comparison theory and the third section presented the postulates of comparison theory. It is time now to discuss, albeit briefly, how to get from the postulates to the predictions.⁵ We already have mentioned two main tools: the micromodel and the macromodel. The terms micromodel and macromodel are not exact, as both techniques use both micro and macro terms and both techniques yield predictions at both micro- and macrolevels. The terms are useful nonetheless, as the main task of derivation starts with an individual in the micromodel and with a population in the macromodel.

⁵Geoffrey Tootell has remarked in oral presentations that all the action lies between the postulates and the predictions.

Though there are other ways of deriving predictions, these two techniques have proved sufficiently useful in a variety of cases as to warrant brief summaries. But first, a few general remarks are in order.

Ceteris Paribus Predictions in a Multifactor World

All the predictions of comparison theory are *ceteris paribus* predictions. Without doubt, in most situations there are many factors at work. Comparison processes constitute only one of the possibly many influences shaping behavioral and social phenomena. The predictions of comparison theory represent only the operation of comparison processes.

The Role of Additional Assumptions

The implications presented above—with one exception, the prediction about parental gift giving, which as stated incorporates a condition and which is discussed below—are derived solely from one or more of the five postulates in the third section. Some of these implications describe events or actions that increase or decrease someone's well-being; such implications are of the form, "Such-and-such a behavior or event increases (or decreases) someone's well-being." These implications have the feature that they can be combined with an additional assumption in order to derive further implications that on occasion may prove more felicitous or more pertinent.

If the "someone" is the individual him or herself, then introducing two additional assumptions—(1) that individuals seek to increase their well-being, and (2) that individuals are aware of the behavioral relationship embodied in the implication—will produce a new implication that the individual will "prefer" the event, or will engage in the behavior, that increases (or decreases) his or her well-being.

Similarly, if the "someone" whose well-being is affected is someone else, then introducing two additional assumptions—about whether the first actor wishes to increase or decrease the other's well-being and about the first actor's knowledge of the behavioral relationship embodied in the implication—will produce a new prediction.

Let us illustrate. Application of micromodel procedures to theft yields the prediction that a thief's gain from theft is greater when stealing from a fellow group member than when stealing from an outsider. Incorporating the additional assumptions that individuals seek to increase their well-being and that prospective thieves are aware (however vaguely) of the link between the gain in well-being and the victim's group leads to a new prediction, "A thief will prefer to steal from a fellow group member rather than from an outsider." Obviously, if the thief seeks to decrease his gain from theft, he or she will prefer the opposite. Moreover, the new prediction may be more applicable to experienced thieves, who may have noticed the link between the gain in well-being and the victim's group, or to thieves in a thief culture that may impart to apprentice thieves the knowledge gained by their predecessors.

Similarly, application of micromodel procedures to gifts yields the prediction that if a child in a sibship of young children receives a gift from outside the sibship, then the other children will experience a loss in well-being. Incorporating the additional assumptions that parents seek to prevent a loss in well-being among their children and that they are aware of the link between gifts and well-being leads to the prediction that they will give more gifts at an annual gift giving occasion than at the children's birthdays. This is a case in which parents

quickly learn about the implied link, though many also benefit from the cultural transmission of parenting lore.

Of course, many of the predictions of comparison theory end, so to speak, within the confines of comparison theory; they are not amenable to the type of manipulation to which the implications about individual well-being are susceptible. For example, the prediction that blind persons are less susceptible to eating disorders cannot readily be used to generate additional predictions.

Micromodel Procedures

The micromodel approach begins with investigation of the effects of an event on an individual, where the event may be a human action (such as giving a gift or stealing a radio), or the outcome of a human action (such as receiving a gift or having a radio stolen), or an event not traceable to human agency (such as a natural disaster). The objective is to assess the effects of the event on a comparison outcome. The micromodel thus makes it possible to ascertain change in well-being, or in self-esteem, or in the sense of being justly or unjustly rewarded, establishing, for example, who becomes better-off and who becomes worse-off, and by how much. The basic equation in the micromodel approach is an equation that compares the individual at two points in time:

$$CZ = Z_2 - Z_1 \quad (8)$$

where, as before, Z denotes the comparison outcome (e.g., well-being) and CZ denotes change in Z . Thus, the micromodel investigates the change in Z between time 1 and time 2. If CZ is zero, then whatever transpired between the two time periods has had no effect on the individual; if, however, CZ is negative, then the individual has become worse-off, and, if positive, better-off.⁶

The micromodel can be used for both cardinal and ordinal goods, for both small groups and large groups, and for both the case in which the comparison reward is known and the case in which the comparison reward is unknown; that is, the micromodel can be formulated with any of the basic individual-level formulas as its starting-point (panel A, Table 30.3). To date, however, most derivations using the micromodel have been based on the formula for the comparison function for cardinal holdings in small groups when the comparison reward is unknown [Table 30.3, panel A.2., left column, top branch, and also shown in Eq. (5)]. Thus, in this brief summary, Eq. (5) is the basic formula that will be incorporated into the change equation in Eq. (8). The events and actions whose effects on the individual's well-being can be investigated via the micromodel approach are not limited to events or actions that alter the individual's actual reward, but encompass as well events and actions that affect the population size and the population's total amount of the reward, for example, the population's total wealth or total gross domestic product (GDP).

Because there are many events and actions that affect the constituent factors of Z (that affect, for example, in the case of a cardinal good or bad, own wealth, population wealth, and population size), the micromodel procedure can be used for a wide variety of cases. To illustrate, theft affects own wealth x and may affect group wealth S (depending on whether the thief and victim are from the same group); murder affects population size N , may affect x and

⁶Note that the change equation refers exclusively to one individual at two points in time. The individual may become better-off or worse-off relative to his or her own situation at time 1.

S (depending on bequests and relationship to the victim), and may affect the individual's rank i in an ordinal good (bad) regime. Similarly, giving and receiving a gift affect x and may affect S , depending on whether giver and receiver are together or apart; and when a fellow group member gives or receives a gift, S is altered. Note that when S or N is altered, *all* group members experience a change in Z , not merely the protagonists in the situation (such as thief and victim in the theft case or giver and receiver in the gift case).

Plugging Eq. (5) into Eq. (8) yields the basic equation for the change in well-being, in this case of a cardinal good in a small group with the comparison reward unknown:

$$CZ = \ln \left(\frac{x_2 N_2 S_1 \phi_1}{x_1 N_1 S_2 \phi_2} \right) \quad (9)$$

Table 30.4 outlines the protocol for the micromodel strategy, applied to a cardinal-good regime. As shown, the micromodel approach begins with the formulas for Z (step 1, Table 30.4) and for CZ (step 2, Table 30.4). The goal is to systematically draw out the implications of basic comparison processes for a wide range of disparate domains. Accordingly, at the next step the theorist chooses a field of application (step 3, Table 30.4). In general, any domain involving alterations in own wealth, population wealth, or population size is a candidate. Once the theorist has selected the particular domain, the theorist identifies the kinds of actors involved and the kinds of situations and provides the pertinent special notation. The ensuing setup and analysis is referred to as a model of _____ phenomena based on comparison theory, often abbreviated to _____ model. Examples include the comparison-based theft model, the comparison-based gift model, and the comparison-based disaster model.

TABLE 30.4. The Micromodel Strategy for Generating Predictions in Comparison Theory: Studying the Effects of an Event or Action in a Cardinal-Good Regime

1. Write basic comparison-function formula, cardinal-good case.

$$Z = \ln \frac{xN}{S\phi}$$

where Z denotes the comparison-based response (say, happiness or well-being), x denotes the individual's own amount of the cardinal good (say, wealth), S denotes the total amount of the cardinal good in the collectivity, N denotes the population size, and ϕ denotes the individual-specific parameter capturing idiosyncratic elements in the comparison standard used by the individual for him- or herself.

2. Express change in Z from time 1 to time 2.

$$CZ = Z_2 - Z_1$$

$$CZ = \ln \frac{x_2 N_2}{S_2 \phi_2} - \ln \frac{x_1 N_1}{S_1 \phi_1}$$

$$CZ = \ln \frac{x_2 N_2 S_1 \phi_1}{x_1 N_1 S_2 \phi_2}$$

3. Analyze the particular event or action.
4. Write the formulas for CZ for each kind of person in each situation or special case.
5. Is CZ positive or negative? (This requires an assumption about ϕ ; for example, assume $\phi_1 = \phi_2$.)
6. In which situation does each kind of actor have the higher CZ ? (For each actor, evaluate the inequalities across all situations.)
7. Within situation, which actor has the higher CZ and absolute value of CZ ?
8. Obtain first and second partial derivatives of CZ with respect to each factor in the CZ formulas.
9. The results obtained in 5–8 comprise the predictions.

Space constraints do not permit comprehensive exposition of the micromodel. However, detailed exposition is found in Jasso (2000). Micromodel procedures have been used to derive implications for theft (Jasso, 1988b, 2000), gifts (Jasso, 1993c), disasters (Jasso, 1993b), and migration (Jasso, 1996a).

Macromodel Procedures

The macromodel method begins with the *distribution* of a comparison outcome—as before, let us call it *Z*—together with the parameters, subdistribution structure, and other features of that distribution. For example, the macromodel may begin with the distribution of justice evaluations in a society or with the happiness distribution in a group. In general, the macromodel is used whenever a problem is posed that focuses on aspects of the distribution as a whole or on connections between aspects of the subdistribution structure.⁷ Four examples will provide concreteness.

First, in justice theory an appealing idea is that a society can be usefully represented and characterized by the distribution of justice evaluations among its member. Interest thus centers on the *Z* distribution. Because *Z* is a function of the actual and comparison holdings—*A* and *C*—characterizing the *Z* distribution requires information about the *A* and *C* distributions and their intercorrelations. A theoretical problem for which macromodel procedures are well suited is the problem of establishing a priori what happens to the *Z* distribution in the following cases: (1) if *A* and *C* refer to cardinal versus ordinal goods, (2) if *A* and *C* have positive or negative or zero correlation, (3) in the cardinal-good case, if inequality in *A* and *C* varies, or (4) in the cardinal-good case, if *A* and *C* have particular distributional shapes.

Second, one approach to the study of conflict posits a society with two subgroups in which the two subgroups are nonoverlapping in the distribution of a valued good. For example, the physicians and nurses on staff at a hospital may value earnings, and the earnings of the highest-paid nurse may be less than the earnings of the lowest-paid physician. This approach suggests that the severity of the conflict between the physicians and the nurses will vary with the difference between the mean *Z* for the advantaged group (the physicians) and the mean *Z* for the disadvantaged group (the nurses). To investigate conflict severity, we study the censored subdistribution structure, in which the distribution yields two censored subdistributions, with the censoring point set at the proportion in the disadvantaged group (e.g., the proportion nurses among the staff). We obtain expressions for the expected value of the right-censored subdistribution (the nurses) and the expected value of the left-censored subdistribution (the physicians) and we address a priori questions about how the difference between the two expected values may vary with the subgroup split (the proportion who are nurses and the proportion who are physicians) and with the earnings inequality.

Third, in theoretical justice analysis it often is of interest to investigate the proportions who are underrewarded and overrewarded and the expected values of each subset. In this case, the relevant subdistribution structure is a truncated subdistribution structure, with the truncation point fixed at zero, the point of perfect justice, which divides the underrewarded from the overrewarded. As in the previous problem, attention centers on analyzing how the proportions

⁷The macromodel makes use of censored and truncated subdistributions. There is some confusion about terminology in the literature, and we follow the usage in Moses (1966) and in Johnson and Kotz (1969, p. 27). Truncation refers to selection of the units by values of the variate. Censoring refers to selection of the units by their ranks or percentage (or probability) points. For example, the group with incomes less than \$20,000 forms a truncated subdistribution; the top 5% of the population forms a censored subdistribution.

underrewarded and overrewarded and their means differ across societies with cardinal versus ordinal valued goods and in the cardinal case vary with inequality in the valued good.

Fourth, an appealing idea is that there may be a “mainstream” in the Z distribution, and that this mainstream consists of individuals with Z scores between -1 and $+1$. The question arises how the proportions in the mainstream and in the “underclass” and the “overclass” differ across types of valued-good regimes. As in the third example, this question is addressed via the truncated subdistribution structure, which in this case yields three subdistributions, with truncation points at -1 and $+1$.

There are two main goals in the macromodel approach. The first is to obtain distribution-independent results; the second is to obtain results for a wide variety of distributional forms that can be regarded as approximations to real-world distributions of valued goods at different times and places. It has been shown that for ordinal holdings, the correct modeling distribution is the rectangular (Jasso, 1980). As for cardinal goods and bads, a useful selection of modeling distributions would consist of continuous nonnegative distributions that exemplify combinations of features considered important a priori. Two such features are whether the variate approaches zero from the right and whether the variate tends to positive infinity: in ordinary (and imprecise) language, whether or not the society has a minimum income and whether or not it has a maximum income. Treating each dimension as a dichotomy, this approach leads to four combinations. Distributions that exemplify these combinations—the exponential, lognormal, Pareto, power-function, and quadratic variates—have been used for several years in comparison theory research. Ongoing work is extending the set of modeling distributions to include other distributional families. Candidates for modeling distributions are found in the standard sources (Johnson & Kotz, 1970a,b; Hastings & Peacock, 1974; Evans, Hastings, & Peacock, 1993; Stuart & Ord, 1987; articles in the *Encyclopedia of Statistical Sciences*, e.g., Kotz, Johnson, & Read, 1985; etc.).⁸

As in the micromodel, the starting point for theoretical derivation may be a formula for Z when the comparison reward is explicitly included or, alternatively, a formula for Z when the comparison reward is unknown (see Table 30.3, panel A). It is considerably easier, both mechanically and in terms of substantive modeling, to base application of macromodel procedures on the formula when the comparison reward is unknown or is fixed at a common quantity for everyone and early applications did that. When the comparison reward is treated as unknown, the results are interpreted as the predictions net of the operation of the idiosyncrasy parameter ϕ . Examples include Jasso (1991, 1993a–c, 1996a). More recent theoretical derivation using macromodel procedures has been based on the formula for Z that explicitly includes the comparison reward (Jasso, 1997a, 1999).

Whatever the substantive question that will be addressed via macromodel procedures, some basic information about the Z distribution is required. Table 30.5 reports the results of investigating the shape of the Z distribution when the formula for Z includes both the actual and the comparison rewards. As shown, two important features are (1) whether A and C are identical or different, and (2) the relation between A and C , in particular whether A and C are independent, perfectly positively associated, or perfectly negatively associated, producing six special cases. Panel A reports distribution-independent results. For example, if A and C are identically and independently distributed, the Z distribution will be symmetric about zero (equal proportions underrewarded and overrewarded). Panel B reports the results for four cases in which A and C belong to the same variate family, the variates investigated being the rectangular (which models ordinal holdings), the Pareto, the power-function, and the lognor-

⁸Comprehensive exposition of the macromodel approach is provided in Jasso (1997b).

TABLE 30.5. Distribution of $Z = \ln\left(\frac{A}{C}\right)$

A,C Variate	Relation between A and C		
	A & C Independent	$\rho(A,C) = +1$	$\rho(A,C) = -1$
A. Distribution-Independent Results			
Identical	Z symmetric about zero	Z degenerate at zero	Z symmetric about zero
Different	Z asymmetric/symmetric about any number	Z asymmetric/symmetric about any number	Z asymmetric/symmetric about any number
B. A and C from Same Variate Family			
Rectangular			
Identical	Laplace	Equal	Logistic
Different	—	—	—
Pareto			
Identical	Laplace	Equal	Logistic
Different	Asymmetrical Laplace	Positive/negative exponential	Quasi-logistic
Power-function			
Identical	Laplace	Equal	Logistic
Different	Asymmetrical Laplace	Positive/negative exponential	Quasi-logistic
Lognormal			
Identical	Normal	Equal	Normal
Different	Normal	Normal	Normal

mal. Table 30.5 shows the distribution of Z for each of these special cases. The special macromodel application can then proceed to establish the subdistribution structure, the subdistribution means, and so on.

BESIDES PREDICTIONS: OTHER HIGHLIGHTS OF COMPARISON THEORY

A theory’s first purpose is to provide testable predictions. A good theory, however, goes beyond providing predictions. A good theory provides a foundation for measurement, and a good theory provides interpretation of rare or nonrecurring events. Comparison theory does both. It also suggests the existence of fundamental constants.

Foundation for Measurement

Comparison theory provides a foundation for measurement of a number of quantities. Here we provide three examples.

MEASURING THE JUST REWARD. It long has been thought that asking respondents to provide their idea of the just reward—say, the just earnings for self or other—may invite biased measurement, as response mechanisms, together with rhetorical and socialization elements, may interfere. Comparison theory, via the justice evaluation function, makes it possible to measure the just reward in an indirect way that appears to be relatively more protected against bias. This indirect way builds on Jasso and Rossi’s (1977) empirical justice

design, and instead of asking respondents to provide their idea of the just reward asks respondents to judge the fairness or unfairness of reward amounts randomly associated with target recipients. Algebraic procedures utilizing the justice evaluation function can then estimate the “true” just reward.

MEASURING FRAMING. Individuals may frame rewards differently. While most persons may frame earnings as a good, some may frame it as a bad; and while most individuals may frame time in prison as a bad, some may frame it as a good. Until recently, respondents were not allowed the freedom to frame rewards as goods or as bads; the investigator, via the analysis procedures, imposed a single view on all respondents. Comparison theory, via the comparison function, makes it possible to estimate for each respondent a *framing coefficient*; the framing coefficient can assume values of -1 , which indicates that the respondent frames the reward as a bad, and $+1$, which indicates that the respondent frames the reward as a good.

JUSTICE INDEXES AND INJUSTICE DECOMPOSITIONS. Comparison theory, in the justice version, makes it possible to measure the total amount of injustice experienced in a society, via two justice indexes recently proposed (Jasso, 1999). Additionally, one of the two justice indexes yields two distinct decompositions. The first decomposition enables measurement of the amount of injustice due to poverty and the amount of injustice due to inequality. The second decomposition enables measurement of the amount of injustice due to reality and the amount of injustice due to ideology.

Interpretation of Rare Events

Comparison theory, along with its predictions, provides a framework for interpreting rare or nonrecurring events. We provide three examples.

MENDICANT INSTITUTIONS. Comparison theory suggests that the invention, in the late 12th century, of mendicant institutions (Franciscans, Dominicans) was a response to the switch from valuing birth and nobility to valuing wealth. This interpretation arises from an application of comparison theory in which the public benefit of religious institutions varies with the difference between the mean well-being of a society before and after a subset become cloistered and renounce the valued good. When the valued good is birth or nobility, the archetypal monastic institutions (Benedictine, with individual poverty but not corporate poverty) provide a public benefit, but when the valued good is wealth, the monasteries, some of which can be quite wealthy, fail to provide a public benefit. It was the genius of Francis of Assisi and Dominic to invent an institution in which the house itself and not merely the monks embraced total poverty. Valued goods rise and ebb, and the history of total poverty in religious institutions (e.g., the great debates among the Franciscans, in which William of Ockham made an inspired defense of total poverty,⁹ and the great Teresian reforms of the Carmelites¹⁰) may be interpreted as a response to the valued-good regime around them.

DETECTIVE FICTION. Comparison theory suggests that when cardinal goods are valued, murder needs a motive. Thus, it is no accident that the search for a motive in the murderer-

⁹It is not without interest that the great champion of parsimony in intellectual structures was also the great champion of total poverty in religious institutions.

¹⁰See St. Teresa's *Camino de Perfección* and the *Constituciones* (Teresa de Ávila, 1546–1582/1982).

detection enterprise and the associated literary genre seem to have arisen in 19th century England.

MARIEL EMIGRATION. Comparison theory suggests that there are two ways to punish a foe, by reducing its good and by increasing its bad. Suppose that from the perspective of nation-states, some members of the population constitute a good (e.g., able-bodied, upright, skilled soldiers) and others constitute a bad (e.g., felons and social or political undesirables). Then an aggressor nation has two possible instruments: (1) going to war and killing some of the target nation's soldiers (or scientists), thus reducing its good, and (2) sending social undesirables to the target nation, thus increasing its bad. According to comparison theory, then, in the Mariel emigration of 1980, Castro used a "punish-via-bad" strategy against the United States, sending "social misfits" among the Mariel emigrants. As a White House aide put it, "Castro in a way, is using people like bullets aimed at this country" (Rivera, 1991, p. 7).

Fundamental Constants

Comparison theory suggests the existence of two sets of fundamental constants.

CRITICAL INEQUALITY LEVEL. Comparison theory suggests the existence of a critical inequality level, occurring when Atkinson's inequality equals $1 - (2/e)$, or approximately .264.¹¹ This critical inequality level is thought to govern the switch between valuing cardinal goods and valuing ordinal goods, for example, the switch between valuing birth and valuing wealth. In a society that values a cardinal good, when inequality in that cardinal good approaches the critical level, a switch is triggered from valuing that cardinal good to valuing another good. Conversely, in a society that values an ordinal good, when economic inequality declines comfortably below .264, a switch is triggered from valuing any ordinal good to valuing wealth. In the exponential, lognormal, and Pareto distributions, the critical inequality level occurs when the Gini coefficient is approximately .42; in the power-function variate, the critical inequality level occurs when the Gini coefficient is approximately .33.

SOCIETAL MAINSTREAM. Comparison theory suggests that the societal mainstream lies between Z values of -1 and $+1$. In the special case in which the comparison reward is the mean reward (i.e., equality), the critical Z values occur at relative ranks or ratios of $1/e$, or approximately .368, and e , or approximately 2.72. In this case, ordinal-good societies have no "overclass"; cardinal-good societies may have no "underclass," or no "overclass," or neither.

Ongoing Extensions

Current work, besides continuing to derive new predictions, is extending comparison theory in two new directions. The first involves analyzing the policy implications of comparison theory. It turns out that some of the predictions are amenable to interventions (and others not). For example, the prediction that conflict severity increases with the gap in mean Z

¹¹Atkinson's (1970, 1975) inequality refers to the measure of inequality defined as one minus the ratio of the geometric mean to the arithmetic mean. See also Jasso (1982, 1999) for exposition and elaboration.

between nonoverlapping subgroups is amenable to design of an intervention. To illustrate, in the case of physicians and nurses discussed above, one possible intervention strategy is to destroy the nonoverlappingness; this can be accomplished by one or both of two tactics: create new nursing positions that are highly paid (paid more than some physician positions) and create new physician positions that are poorly paid (paid less than some nursing positions).

A second new direction involves scrutinizing the predictions to see what light they may shed on the emergence of social norms. This activity, whose initial report appears in Jasso (2000), yields a set of new predictions, including the prediction that the rule, “Thou shalt not steal,” is not likely to arise unless it is imposed by Guardians.

FREQUENTLY ASKED QUESTIONS

FAQ 1. What Is the Exact Relation between Justice Theory and Comparison Theory?

To answer this question precisely, we first identify three elements—justice theory, comparison theory, and the justice version of comparison theory—noting that the first two are families of theories while the third is a single theory. To visualize their relations, Fig. 30.1 provides a Venn diagram.

As depicted in Fig. 30.1, justice theory consists of many theories, of which the justice version of comparison theory is only one (see Chapter 3). Meanwhile, the justice version of comparison theory also is a member of the comparison theory family, differing from it in that the larger comparison theory, of which this chapter provides an overview, encompasses not only justice but also all other comparison outcomes, such as happiness, well-being, and self-esteem.

Another way to describe the exact relations between comparison theory, justice theory, and the justice version of comparison theory is by examining their postulates. The first postulate of the larger comparison theory is the comparison function and the first postulate of the justice version of comparison theory is the justice evaluation function, which is a special

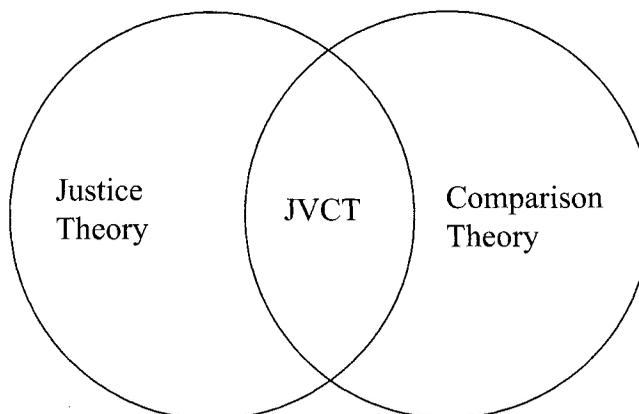


FIGURE 30.1. The Justice Version of Comparison Theory (JVCT) is a member of both the Justice-Theory family and the Comparison-Theory family.

case of the comparison function. Note, however, that both the comparison function and the justice evaluation function used in the justice version of comparison theory are *reflexive* functions, in which the observer reflects about his or her own situation. A larger version—the original justice evaluation function that applies to justice evaluations about both self and other—appears as the first postulate of other members of the justice theory family (see Chapter 3). Thus, the comparison function is both broader and narrower than the justice evaluation function. It is broader in that it applies to a larger set of outcomes, not only the justice evaluation but also happiness, self-esteem, and so on. But it is narrower in that it applies only to reflexive assessments, while the justice evaluation function applies to both reflexive and nonreflexive assessments.¹²

FAQ 2. How Can Comparison Theory Make Predictions about So Many Things Like Gifts and Theft and Religious Institutions When It Cannot Predict the Underlying Happiness or Justice Evaluation?

Comparison theory cannot predict an individual's happiness or justice evaluation without information about the actual holding and the comparison holding. Happiness, the justice evaluation, and other outcomes are predicted to vary with the actual reward and the comparison reward, as in the basic comparison function,

$$Z = \theta \ln \left(\frac{A}{C} \right) \quad (10)$$

but while the actual reward may be known, the comparison reward often is not known and cannot be predicted (there is not yet a theory that predicts what a person will think is just or appropriate for him- or herself).

However, due to the separability of terms inherent in the logarithmic specification of the comparison function, we can predict the effect of a change in the actual reward on the Z outcome. Moreover, when we incorporate the identity representation of the comparison holding, as in the basic comparison function formula for the cardinal-good case,

$$Z = \theta \ln \left(\frac{xN}{S\phi} \right) \quad (11)$$

we also can predict the effect of a change in the population size and wealth. Further, when we embed this formula in the micromodel and macromodel sets of procedures, we can derive large sets of additional predictions, concerning, for example, whether a person's gain (or loss) in well-being is greater in one or another group or situation and which actors gain (or lose) more in each group or situation (see the micromodel protocol in Table 30.4). To illustrate, comparison theory cannot predict a thief's gain from theft, but it can predict that the gain from theft will be greater when stealing from a fellow group member than when stealing from an outsider. Similarly, comparison theory cannot predict a gift-receiver's gain from the gift, but it can predict that the gain will be greater when the giver is present.

It seems remarkable that even though we are unable to predict the basic quantity Z or the change CZ , it nevertheless is straightforward to derive so many other predictions. Moreover,

¹²This leads to a related point. While in comparison theory there are two main methods for deriving predictions—the micromodel and macromodel—which both begin with reflexive comparison outcomes, in justice theory there is a third method—the matrixmodel—which begins with the full matrix of justice evaluations about both self and others.

the predictions that can be derived are for phenomena that may be even more interesting (to a sociologist, at least) than the ones that cannot be derived; that is, predictions about parental gift giving, bereavement across historical eras, posttraumatic stress among combat veterans, and theft victims may be more pertinent to sociology than predictions about the magnitude of an individual's happiness. To illustrate, the prediction that a thief's gain from theft is greater when stealing from a fellow group member than when stealing from an outsider may be more pertinent to sociology than a prediction about the thief's exact gain from theft. Similarly, the prediction that a gift-receiver's gain from the gift is greater when the giver is present than when the giver is absent may be more pertinent to sociology than a prediction about the gift-receiver's exact gain from the gift.

Technically, looking at the comparison function formula in Eq. (11), the reason that we cannot predict Z or CZ is that we do not know ϕ , and the reason that we can predict so many other things is that the logarithmic specification makes it possible to separate the effects of ϕ from the other effects. Moreover, in many derivations, notably those involving a comparison of two CZ s, ϕ vanishes outright.

FAQ 3. Isn't It Unrealistic to Assume That People Are Always Comparing Themselves to Others?

Yes, and comparison theory does not make such an assumption. As noted in the first section, the starting idea for comparison theory is indeed the idea that humans compare themselves to others and/or to previous or envisioned selves and thereby experience a variety of judgments and sentiments, including happiness, well-being, self-esteem, and the sense of justice. Note that even in that unformalized expression, the starting idea covered individuals who never compare themselves to others, only to themselves at some past or future time.

But comparison theory takes an additional and important step. It shifts the comparison from a comparison of self to other or self to previous/envisioned self to a comparison of the actual levels of attributes and amounts of possessions to the levels/amounts expected or desired or thought just or appropriate. This shift both makes possible the mathematical formalization and also has profound implications for the substantive coverage of comparison theory and correct interpretation of its assumptions and predictions. This shift implies, among other things, that individuals who never compare themselves to others are fully within the theoretical umbrella, as are individuals devoid of any concern for relative rank, provided they compare what they have to some standard or referent, whatever its source.

FAQ 4. How Can We Interpret the Predictions of Comparison Theory Given That So Many Important Factors Are Omitted?

The predictions of comparison theory are *ceteris paribus* predictions. They inform us about the part played by comparison processes in the social life. Our basic premise is that, following the view advanced by Newton for understanding physical nature, observed behavioral and social phenomena may be regarded as the product of the joint operation of several basic forces. Put differently, we believe that the world we seek to understand is a multifactor world, a view widely accepted in modern social science.¹³

This multifactor view of the world poses two main scientific challenges: one theoretical, the other empirical. The theoretical challenge is to identify the basic forces governing human

¹³For example, see Parsons (1968) on Durkheim as a multifactor theorist.

behavior, to describe their operation, and to derive their implications. The empirical challenge is to test the derived implications. The theoretical and empirical work jointly lead to the accumulation of reliable knowledge about human behavioral and social phenomena.

Comparison processes are not at the level of fundamental forces; thus, comparison theory lies in the Mertonian middle range (Merton, 1949/1968). The basic research challenge is to discover how fundamental forces generate the comparison impulse.

Empirically, the multifactor view poses special challenges, for the operation of two factors may lead to opposite effects. It may at first appear that one prediction is rejected, but in fact it may be that one of the two effects is stronger than the other. For example, suppose that comparison theory predicts that Y is an increasing function of X and a theory about another mechanism B predicts that Y is a decreasing function of X . The empirical finding that Y is an increasing function of X does not constitute, in a multifactor world, evidence that mechanism B is not operating, but rather is consistent with the operation of both mechanisms such that the effect of the comparison mechanism is stronger, or “dominates” mechanism B. And conversely.¹⁴

The multifactor view of the world leads to a deeper understanding about the importance of theoretical development on many fronts. Put starkly, we cannot know the precise operation and effects of comparison processes without empirically pitting the predictions of comparison theory against the predictions of other theories about other processes. Probably, one mechanism will dominate in some contexts, a second in other contexts, a third in still others, and so on. But it will not be possible to isolate and measure the exact effects of comparison processes unless the predictions of other theories are simultaneously tested. For example, in any of the topical domains for which comparison theory yields implications—family, gifts, crime, religious institutions—there are likely to be other basic processes at work. Correct understanding of the part played by comparison processes requires simultaneous test of the operation of those other processes.

Thus, there is a jointness about theoretical work. Progress in comparison theory depends on progress in other theories. As John Donne would have understood, the fate of comparison theory is inextricably bound with the fate of other theories.

FAQ 5. How Do We Know Which Is the Group to Which a Prediction Applies?

Many of the predictions of comparison theory refer to a group or groups. In some cases, the group is made explicit (for example, predictions about families, parents, and children make explicit the group to which they refer), but in others, not. Consider, for example, the prediction about a thief’s gain from theft being greater when stealing from a fellow group member. What is meant by “group?”

All predictions that leave the group unspecified are predicted to hold for whatever group or groups is salient to the particular actor. Suppose the prospective thief is a college student living on the west wing of the third floor of a dormitory; the prospective thief is also female and of Etruscan ethnicity.¹⁵ What does “group” refer to? Our protagonist could think of herself as belonging to any of the following groups: all college students; college students at

¹⁴This is one of the reasons why it is easier to test a theory the more fruitful it is. As Danto (1967, pp. 299–300), observes, “Indeed, it is by and large the ability of a theory to permit derivations far afield from its original domain which serves as a criterion for accepting a theory, for in addition to the obvious fruitfulness such a criterion emphasizes, such derivations permit an increasingly broad and diversified basis for testing the theory.”

¹⁵The reader will forgive the time travel. It is best not to ascribe thieving designs to contemporary ethnicities.

this college; all residents of her dormitory; all residents of the third floor of her dormitory; all residents of the west wing of the third floor of her dormitory; all women; all female college students; all Etruscans; all female Etruscans; all female Etruscan college students; and so on.

The prediction holds for whichever groups are salient to her. Following the classic W. I. Thomas idea of “definition of the situation,” the prediction applies to whatever groups she defines herself as belonging to.¹⁶ Now, it may happen that three of the possible groups are salient to her, and thus the prediction applies to those three—say, dorm co-residents, college students, and female Etruscans. However, it also may be the case that these three are differentially salient; college students is the salient group 30% of the time, dorm coresidents 35% of the time, and female Etruscans 35% of the time. Then, according to comparison theory, she would prefer to steal from a college student rather than from a noncollege student, from a dorm coresident rather than from anyone else, and from a female Etruscan rather than from males and non-Etruscans. Moreover, the preference would be stronger for the latter two, which are more salient to her (35% of the time for each vs. 30% of the time for the college student group).

The empirical challenges are evident. Because each thief or prospective thief in a population would have a different configuration of group definitions, the research design must be especially clever—the hallmark of theory-driven research is cleverness—in order to discern operation of the comparison effect and measure it.

That is not all. Meanwhile, other factors in this multifactor world are at work. Some of these will militate against stealing from a fellow group member in some groups. For example, there may be a strong Etruscan ethic against stealing from a fellow Etruscan. Accurate measurement of the comparison theory effects in each group requires inclusion in the empirical work of the predicted effects of other factors, as discussed in FAQ 4 above.

It is easy to see that if our prospective thief thinks of herself as an Etruscan all of the time and concomitantly there is a strong Etruscan ethic against insider theft, then it will not be possible to measure the comparison theory effect unless one also measures the Etruscan-ethic effect, conducting the research in a way that permits identification of the two opposite effects.

FAQ 6. Is Comparison Theory Limited to Things That Can Be Summed?

No. However, it is easy to get this impression from work that uses the micromodel set of procedures for deriving predictions, because even though the micromodel applies also to ordinal goods and bads, most derivations to date that have used the micromodel have applied it to situations involving cardinal holdings (in fact, cardinal goods). Moreover, even though these applications are usually labeled (saying, for example, “cardinal-good regime” or “quantity-good” or some synonym), the existence of the counterpart ordinal-holding procedures may be overlooked.

The macromodel, however, has had a different application history. Here, a central feature of the theoretical derivation has been to establish systematic differences between groups that value cardinal things (like wealth) and groups that value ordinal things (like beauty, health, virtue, intelligence). Predictions have included the prediction that the most advantaged person in an ordinal world feels less overrewarded than the most advantaged person in a cardinal world (for example, the most beautiful person feels less advantaged than the richest person);

¹⁶This idea, called the Thomas Theorem by Robert K. Merton (1942/1973, 1995), states, “If men define situations as real, they are real in their consequences.” The Thomas Theorem, owed to W. I. Thomas, first appeared in Thomas and Thomas (1928); Merton (1995) provides the history of the theorem and its ascription.

the prediction that, given a conflict between the two subgroups of a two-subgroup society, in nonmaterialistic societies conflict severity decreases as the size of the lower subgroup increases, but in materialistic societies, the direction of the effect of subgroup size on conflict severity depends on the shape of the income distribution.

Thus, the question in this frequently asked question typically is asked by readers of micromodel-based derivations, but never by readers of macromodel-based derivations.

FAQ 7. How Do We Test Comparison Theory?

Accumulation of reliable knowledge about human behavioral and social phenomena requires empirical work. However coherent or elegant a theoretical structure, ultimately it stands or falls on its fidelity to empirical reality.

In general, two kinds of issues arise in testing a scientific theory: philosophical and practical. The philosophical ground has been cogently and carefully covered in the 20th century; social science is particularly indebted to Karl R. Popper (1959, 1963), Thomas S. Kuhn (1970), and Imre Lakatos (1970).¹⁷ If one considers the empirical assessment of a single theory in isolation, then the questions that arise are: (1) how many tests? (2) of how many predictions? (3) with what combination of results? There is widespread agreement that rejecting a prediction is not a sufficient condition for rejecting a theory. Moreover, rejecting a prediction is not a necessary condition for rejecting a theory; even if all of a theory's predictions survive test unrejected, one may still reject the theory, in favor of a better theory, one with "excess corroborated content" (Lakatos, 1970). Indeed, the view known as "sophisticated falsificationism" holds that it is not possible to judge the empirical merits of a theory in isolation; falsification requires comparison of the relative merits of two theories (Lakatos, 1970, p. 116).

Consider now the special problem faced by all theories of a single process or a single force: it can be difficult to discern whether discrepancies between the theory's predictions and empirical data are due to a defective theory or instead to the operation of another basic process. Of course, design of empirical work usually takes into account the possibility that many other factors may be at work; courses in the empirical methods of the social sciences routinely teach procedures for guarding against omitted-variables bias. For example, design of the test of the comparison theory prediction that a married couple's earnings ratio affects marital cohesiveness, as manifested in the couple's sexual activity, explicitly incorporated the operation of a wide range of other factors possibly implicated in sexual activity, including the unobserved sexual drive and the presence of young children (Jasso, 1988a). Nonetheless, interpreting tests of the predictions of a theory of a single process, given the near certainty that we live in a multifactor world, requires judiciousness and circumspection.

Practical issues that arise in testing scientific theories include (1) selection of predictions to test and the order in which they will be tested; (2) for each prediction to be tested, choosing between two strategies (designing new explicit tests versus conducting meta-analyses of extant studies); and (3) for each prediction to be tested, deciding whether the test is best conducted by the theorist (who may be a general theorist with no special knowledge of the subject matter of the prediction) or by empirical scientists who specialize in the topic of the prediction. Ironically, when the theory is fruitful and yields many implications for many disparate phenomena, the practical problems are compounded. For example, rigorous test of

¹⁷For brief discussions of the philosophical issues that arise in testing, see Reynolds (1971) and Jasso (1988b, pp. 3–5, 1989, pp. 139–141).

even a few predictions across several topical domains almost certainly will require leadership from empirical experts in those topical domains.¹⁸

FAQ 8. What Is the Current Evidentiary Status of Comparison Theory?

First, a few predictions have received rigorous, explicit test. One is the prediction that, *ceteris paribus*, marital cohesiveness declines, the greater the disparity between husband and wife in their holdings of valued goods (deduced in Jasso, 1983, tested in Jasso, 1988a). Another is the prediction that each individual has a unique signature constant in the comparison function (proposed in Jasso, 1980, tested in Jasso, 1990). In both cases, the empirical results were consistent with the predictions.

Second, several predictions are consistent with the results of rigorous empirical work that was not designed to test them. These include the prediction that the response to gains is concave and the response to losses is convex, as documented by Tversky and Kahneman (Kahneman & Tversky, 1979; Tversky & Kahneman, 1986) in extensive experimental work; and the prediction that the rate of vocations to the religious life is higher in societies with poverty and gross economic inequality than in societies with less inequality and a “safety net,” a prediction consistent with Ebaugh’s (1993) findings concerning the dearth of religious vocations in the United States and the abundance in Third World countries.

Third, several predictions are consistent with known facts. These include the prediction that parents of two or more children (who do not all have the same birthday) will spend more of their toy budget at a single annual gift giving occasion (such as Christmas) than at the children’s birthdays, a prediction borne out by published toy sales figures (Jasso, 1993c).

Fourth, several predictions are consistent with notions that although not rigorously documented appear to be widely believed. These include the prediction that the incidence of gift giving is greater during courtship than after marriage and greater in wartime than in peacetime.

Finally, some predictions are novel and there seems to be no hint of them in any literature, technical or lay. These include the prediction that posttraumatic stress syndrome is less severe among veterans of wars fought on home soil than among veterans of wars fought away from home. Interestingly, a distinguished journalist, chronicling a recent trip to Vietnam, observes that Vietnamese veterans of the Vietnam War appear to be better adjusted than American veterans of the Vietnam War (Sheehan, 1991), but does not make the connection to the battle site. Another novel prediction is the prediction that blind persons are less susceptible to eating disorders than are the nonblind. Still another novel prediction is the prediction that games of chance are salutary, contrary to the view that gambling is a vice.

Of the foregoing five sets of predictions, only the first two have a rigorous evidentiary status. The rest require rigorous, explicit test. Note that the predictions are amenable to testing via many empirical strategies. Some are amenable to testing via traditional survey research, others via classical experiments, still others via comparative historical work. For example, predictions about gifts and theft would appear suitable for survey research, predictions about how things change value would seem ideally suited to experiments, and predictions about differential mourning for mothers and fathers across historical periods would seem to require comparative historical research.

Creative, clever empirical research will illuminate the part played by comparison pro-

¹⁸For a brief discussion of these and other practical problems that arise in testing, see Jasso (1993b, pp. 258–263).

cesses in the behavioral and social life and at the same time advance understanding of the confluence of several basic processes in shaping observed phenomena.

FAQ 9. How Do I Get Started Doing Comparison Theory?

You may be interested in studying comparison processes in general, that is, in doing comparison analysis, in which case you may be interested both in doing theoretical work (theoretical comparison analysis) and in doing empirical work (empirical comparison analysis). As this chapter is in a handbook on theory, however, we will have no more to say about empirical analysis (beyond the general comments in FAQs 7 and 8).

You want to do theoretical work on comparison processes. The best training and not coincidentally often the most important contribution involves undertaking a new derivation. The temptation to contribute a new assumption is always strong among young theorists, yet it should be resisted, in part because it provides no training in the activity that occupies 99% of a theorist's time—derivation—in part because it runs counter to parsimony, and in part because it is often derivation that triggers formulation of useful new assumptions. (For example, it was theoretical derivation that led to both the second and third postulates of comparison theory, as derivation quickly ran into obstacles that these postulates later resolved.)

So you will undertake derivation. Again, the best training is to use a tried-and-true method, such as the micromodel or the macromodel. Later you may well devise a new method for deriving predictions. (Again, these methods were developed to overcome deficiencies in other methods.) For now, however, choose either the micromodel or the macromodel.

Which method you choose depends on personal taste. If you love to work with probability distributions, if there is magic in “Gamma” or excitement in “Logistic,” or if your idea of the perfect weekend is to outwit an integral, then the macromodel is for you. On the other hand, if your tessitura is in the land of partial derivatives, or if you like to imagine small groups and how the well-being of their members changes with actions or events that alter individuals' wealth and total wealth and group size, then the micromodel will be greatly satisfying. To be sure, sooner or later you will work with both micromodel and macromodel, as well as with other techniques, and may invent your own. For now, however, choose either the micromodel or the macromodel.

Here is a three-step plan to help you get started doing comparison theory. The micromodel plan and the macromodel plan are the same except for the first and third steps.

- *Micromodel Step One:* Work carefully through the protocol and the application reported in Jasso (2000). The application is a rigorous restatement and elaboration of the theft application. Derive every expression and every effect. Restate every single expression and effect in words (to save space, Jasso, 2000, only describes a fraction of the results). Become fluent with words like “intensifies” and “attenuates” and so on.
- *Macromodel Step One:* Work carefully through the protocol in Jasso (1997b) and the application reported in Jasso (1993a). The application is to conflict phenomena. Derive every expression and every effect. Restate every single expression and effect in words. Become fluent with phrases like “censored subdistribution” and “upper mean” and so on.
- *Between Step One and Step Two:* When you have finished step one, put all thought of comparison theory aside. Catch up on your coursework (as student or teacher). Go to the movies. Read novels. Watch TV. Do empirical work. Run a few regressions.

- *Step Two*: Read the abstracts of every article in *American Sociological Review* and *American Journal of Sociology* for the last full calendar year.¹⁹ If any article piques your interest, read it. If the topic intrigues you, think about it.
- *Between Step Two and Step Three*: When you have finished step two, put all thought of the *American Sociological Review* or *American Journal of Sociology* articles aside. Catch up on your coursework (as student or teacher). Go to the movies. Read novels. Watch TV. Do empirical work. Run a few regressions.
- *Step Three*: If you do nothing at all—merely enjoy the movies, novels, and TV, and master some new empirical technique—chances are very good that you will wake up one day with lots of ideas for a new micromodel or macromodel analysis (or the ideas may greet you when you return from class). You will be excited and anxious, you will feel strange things in your chest and stomach. Write down everything that comes to mind—everything. Do not stop to correct errors or typos or to rephrase things. Mull over these thoughts, but not too long.

The time has come to undertake a systematic analysis. Follow the protocol exactly. For example, if you are working in the micromodel, define each situation and each actor precisely. Take some care in choosing notation. Of course, everything can be revised later, but the experience gained from hard thinking at every step will later prove invaluable.

Doing theory is like writing a poem. Great emotion precedes it and great emotion follows it. In between there is “emotion recollected in tranquillity,” as Wordsworth put it, and the discipline imposed by the rules of deduction or of the rhyming form. What begins as vague unspecified tension is transformed into precise predictions that promise new insights and new perspectives.

Then you send them out to be tested.

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¹⁹From a theoretical point of view, it does not matter if you read all of 2000 or instead the April 2000 to February 2001 issues. But calendars were invented for a purpose, and you will feel good about yourself if you can tell your fellow graduate students or assistant professors that you surveyed all of 2000 without burdening your sentence with the names of months.

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