

TOWARD A RELATIVITY THEORY OF RATIONALITY

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We analyze two conceptions of rationality featured in the social science literature, rationality as a *means-ends* relation and rationality as *logical consistency*. The former concerns the rationality of *actions*; it involves choosing the best means to one's ends and is naturally akin to conceptions of *utility*. The latter concerns the rationality of *judgments*, it involves their consistency with other knowledge and is naturally akin to conceptions of *truth* and *probability*. We assume that (1) a uniform process of judgment formation is involved in both rational and irrational judgments; it follows that the distinction between more or less rational instances must refer to judgmental *outcomes* rather than *processes*; (2) *in the moment* all judgments are consistent with the available evidence hence all are locally (and trivially!) rational. Accordingly, we present a *relativity theory of rationality* whereby any meaningful conception of rationality needs to transcend the local context and involve comparisons of local outcomes with detached (inter or intrapersonal) points of reference.

The terms rationality and its inverse irrationality have enjoyed wide currency in popular and scientific discourses alike. Whether discussing rational beliefs, rational choices, irrational fears or irrational expectations lay speakers use the rationality language confidently and their interlocutors act as if they understand what their counterparts meant. References to rationality and irrationality also are common among social scientists of various ilks. Economists and political scientists use rational choice theory for their predictions and analyses (e.g., Dunleavy, 1991; Elster, 1986), sociologists refer to taxonomies of rationality, psychologists subscribe to notions of bounded rationality (e.g., Gigerenzer & Selten, 2002; Simon, 1991), anthropologists (e.g., Boas, 1991; Levi-Strauss, 1966; Levy Bruhl, 1910/1966) debate whether cultures differ in their rationality, and cognitive therapists strive to eradicate their clients' irrational beliefs that promote suffering (Beck, Rush, Shaw, & Emory, 1979; Ellis, 1962, 1977).

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JSTOR (Electronic archive of core journal in the humanities, social sciences, and sciences) displays over 77,000 results for the term rational in the fields of anthropology, economics, political science, and sociology. Psycinfo yields 12,000 entries for the term rational and over 3,500 for rationality. In short, the use of the rationality language by scientists and lay persons is pervasive.

This ubiquity notwithstanding, the general concept of rationality has resisted satisfactory explication thus far. Different authors have interpreted rationality differently, some highlighting the rationality of *process* (e.g., its logical consistency, its conformance to probability theory), others focusing on the goodness of *outcomes* (e.g., the quality of judgments and decisions yielded by fast and frugal heuristics; cf., Gigerenzer & Goldstein, 1996). It is similarly unclear whether different conceptions of rationality are concordant with cutting edge psychological knowledge, and whether human rationality can be improved, and if so, how. Our present purpose is to submit these various issues to a close scrutiny.

We begin by reviewing two general conceptions of rationality that have dominated major discussions of this topic. We discuss how these conceptions are inter-related and we consider their implicit assumptions and their plausibility in light of psychological findings. We then propose our relativity theory of rationality whereby rationality determination hinges on a reference point from which a decision or judgment is assessed. Relative to the *interpersonal* reference point, what appears rational from one person's perspective may be irrational from another's perspective. Relative to the *intrapersonal* level, what appears rational in given circumstances may appear irrational in other circumstances. In other words, local rationality (or rationality of the moment) can be questioned from alternative, intra and interpersonal perspectives. Our relativity analysis also implies how rationality may be improved by bringing judgments in line with appropriate rationality standards.

A TALE OF TWO RATIONALITIES

Over the years, scholarly discussions of rationality have referred to two distinct conceptions of rationality. One views the rationality issue in terms of the *means-end* paradigm, whereas the other considers it from the standpoint of *logical consistency*. The means-ends approach to rationality (e.g., Atkinson, 1964; Edwards, 1961; Fishbein, 1967; Vroom, 1964) assumes that a means is rational if it serves the actor's objective and is irrational if it does not. From the same perspective, a goal may be considered rational if it is attainable by some feasible means and irrational otherwise. According to the logical consistency framework (e.g., Dawes, 1998; Kahneman & Tversky, 1973), rationality consists in the rendition of judgments in line with one's beliefs and implications of one's various premises and assumptions.

Are the two rationality conceptions related? As in the Moebius Strip, the two conceptions are intricately intertwined and each may be considered a special case of the other: Logical consistency may be considered as a means to the end of (subjective) knowledge (e.g., Hempel & Oppenheim, 1949; Kruglanski, 1989a; Popper, 1959), and in this sense a special case of the means-end paradigm. But, the means-ends schema can be also viewed as a special case of the logical consistency notion whereby choice of the best (most efficient) means to some end is *logically consistent* with one's knowledge about the likely consequences of that means and its alternatives. In what follows, the means-ends and the consistency notions of rationality

are accorded separate treatments, reflecting the way they were treated in prior discussions of rationality.

THE MEANS-ENDS PARADIGM: ON THE RATIONALITY OF ACTIONS

The means-ends framing primarily pertains to one's actions or behavioral choices. It is compatible with grades of rationality whereby a means that serves the end better in some sense than another means (e.g., in terms of the probability of goal attainment) is, therefore, considered more "rational" than that other means. For instance, assuming that a politician's goal was to be elected, making frequent personal appearances before a targeted audience might be considered (by some pundit) a more rational means than merely running TV ads geared at that audience. The means-ends conception of rationality is naturally akin to economic notions of *utility*, that is of the desirability, or satisfaction afforded by attainment of various ends via appropriate means.

The means-end paradigm affords a consideration of *goal rationality* whereby a goal is rational only to the extent that there exist feasible means to its attainment, and is irrational otherwise. For instance, setting the goal of graduating from college might be considered quite rational (in light of one's prior academic performance, and economic resources). In contrast, setting the goal of being liked by every single person, or succeeding at every single task may be considered irrational because of the low feasibility of attaining such all encompassing objectives (Beck et al., 1979; Ellis, 1962, 1977). As in the case of means rationality, one may grade goal rationality in terms of the feasibility of goal attainment. For instance, it may be considered more rational for a high school player to adopt the goal of obtaining a basketball scholarship for college than the goal of becoming a major NBA star.

Thinkers over the ages have approached rationality in means-ends terms. In what follows we provide a brief and selective review of some such approaches.

Plato's Concept of Rationality. In early Greek philosophy, the gist of rationality was considered the employment of reason as *means* to the *end* of true knowledge and understanding. According to Plato (e.g., *The Republic*, *Phaedrus*), it is the gift of rationality that allows humans to penetrate appearances and reach the deep essences of phenomena. As Plato put it "Because of the presence in (humans) of . . . a divine spark (they) can . . . fix (their) intellectual gaze on the realities of the unseen world, and . . . know . . . what is true. . . this, . . . end is attainable, and the (human) who arrives at it will exercise the most important part of himself in the best way that is open to him . . ." (The New Encyclopedia Britannica).

As we will see, whereas Plato equated rationality with pursuit of the specific end of knowledge, later theorists viewed rationality more broadly as the choice of effective means to many desirable ends.

Max Weber's Rationality Taxonomy. Max Weber, the 19th-century thinker, generally considered among the founding fathers of modern sociology adopted the means-end approach to human rationality. Weber's distinction between four types of rationality, *practical*, *theoretical*, *substantive*, and *formal* rationalities, is well known. Only two of these, practical and formal rationalities have been explicitly discussed in means-ends terms (Kalberg, 1980, p. 1158). As shown below, however, all four Weberian rationalities can be understood from the means-ends perspective.

In Weber's scheme, *practical rationality* denotes pragmatic action in the service of everyday interests. In other words, Weber viewed as rational the choice of adequate means to everyday ends. According to Weber "all civic strata, in particular merchants, artisans and traders--show a definite tendency to order their way of life in a self interested, practical rational manner" (Weber, 1946/1958, p. 293 [266]; cited in Kalberg, 1980, p. 1152).

Weber's notion of *formal rationality* also has a strong conceptual affinity to the means-end framework. Specifically, it refers to the calculation of means and procedures involved in the provisioning for one's needs (hence ends that these define). From this perspective, a means is rational to the extent that it fulfills one's needs (or serves one's goals) and the concern of formal rationality is devising a metric for assessing (the degrees of) such rationality.

The remaining two rationality types, namely *substantive* and *theoretical* rationalities have not been generally considered from the means-ends perspective. Yet, a closer look suggests their relevance to this scheme. Substantive rationality was defined as acting in accordance with one's values, i.e., serving via appropriate means those values and the ends these imply. Theoretical rationality was seen to involve "a conscious mastery of reality through the construction of increasingly precise abstract concepts rather than through action" (cited in Kalberg, 1980, p. 1152). In other words, theoretical rationality involves the end of mastering one's environment, via the means of constructing abstract concepts. One way or another then, all of Weber's rationality types represent the *means-end* scheme of rationality.

Durkheim's Rationality Dichotomy. Like Max Weber, 19th and early 20th century theorist Emile Durkheim was one of the founders of sociology. Durkheim also devoted considerable attention to the concept of rationality, and like Weber, he viewed it from a *means-ends* perspective. Durkheim distinguished between individual and social forms of rationality. Both types of rationality involved means-ends relations, but the types of end were different. Specifically, Durkheim saw individual rationality to pertain to people's pursuit of their own (personal or selfish) interests, whereas he saw social rationality to pertain to the public good and larger societal interest. According to Durkheim, religion, for example, is rational because it serves the societal ends of cohesion and solidarity. This may take place when "religions are able by means of ceremonies to assemble individuals, put them in direct contact with each other, and bring forth the same ideas or sentiments amplified by their reciprocal influences" (Durkheim, 2002, pp. 493, 572; cited in Segre, 2008, p. 116).

In the latter instance, the rationality of given means to given ends is closely akin to the notion of functionality and is related to collective goals that individuals may have for the society as a whole (e.g., promoting social cohesion) without necessarily being consciously aware that they have them. For instance, an individual may perform religious practices to secure God's benevolence; this might appear wholly irrational to an agnostic observer in regard to that particular end. Yet our agnostic might recognize, nonetheless, the rationality of the same practice in reference to another goal that the practitioner might hold, albeit implicitly: forging a shared reality with fellow believers.

In other words, whereas we believe that goal constructs are applicable to individuals rather than to societies, we also believe that individuals may have goals concerning their societies of which they may or may not be conscious, and that

may drive their behavior. The latter pursuit is akin to Durkheim's notion of "social rationality."

Herbert Simon's Rationality. Closer to the here and now, the means-ends conception of rationality is central to Herbert Simon's influential work. In his words: "Fundamental (to the conception of rationality) are assumptions about adaptation of *means* to *ends*, of actions to goals . . ." (Simon, 1978, p. 2, emphasis added). According to Simon, the concept of rationality in the social sciences bears a close relation to that of functionality. Specifically, "behaviors are functional if they contribute to certain goals where these goals may be the pleasure or satisfaction of an individual or the guarantee of food and shelter for the members of a society" (p. 3). As a prominent example of such functionalism Simon discusses extensively Freud's psychoanalytic theory that explains "the patient's illness in terms of the functions it performs for him" (p. 3).

Notably, the concept of functionality does not require the actor's conscious awareness of the degree to which her or his behaviors and feelings are means to certain ends. For instance, a patient may be unaware of the fact that her or his hysterical symptomatology is driven by secondary gains and actually serves as means to attention getting, or blame avoidance. Indeed, it may take painstaking efforts on the therapist's part to raise the patient's awareness concerning such functionality. Freud's classic notion of rationalization also pertains to actors' lack of awareness of the real motives behind their actions or feelings that may have served as means to socially unacceptable or taboo ends. Indeed, the well-known notion of motivational biases in judgment and reasoning (Dunning, 1999; Kruglanski, 1996a, 1999; Kunda, 1990; Kunda & Sinclair, 1999) pertains to the degree to which judgments serve various ends (e.g., self-esteem, cognitive closure) without the actor's explicit awareness of this fact. Issues of awareness in 'rational' behavior are addressed at a subsequent juncture.

Rational Choice Theory. Rational choice theory constitutes a family of models premised on the assumption that individuals act in their own best interest according to stable preferences and constraints (e.g., Becker, 1976; Coleman, 1990; Elster, 1986; Lindenberg, 1985; March, 1994). In other words, individuals' choices are assumed to reflect their striving to maximize benefits and minimize costs. In turn, costs and benefits contingent on an action can be gauged in terms of the individuals' various ends. Receiving a benefit represents an attainment of a goal, whereas incurring a cost represents a failure of attainment.¹ Thus, the rationality in rational choice theory can be readily understood in terms of the means-end paradigm. A rational choice is one that maximizes one's outcomes by choosing a *means* (making a decision) that results in attainment of one's most important goal with the least sacrifice of outcomes in terms of possible alternative goals. Rational choice models often assume that individuals possess perfect information (March, 1994), or at least accurate probabilistic notions about the outcomes of any given choice, and that they have the time and the cognitive ability to weigh every choice against every other choice, both of which assumptions are known to be unrealistic

1. It is also possible to think of a benefit as a goal and individual is motivated to approach and cost—a goal that he or she is motivated to avoid.

(March, 1994). Nonetheless, rational choice models assume that human behavior may be understood by postulating that individuals choose means that best serve their ends.

Irrationality as Psychopathology. Most treatments of rationality from the means-ends perspective (including those of Weber, Durkheim, and Simon reviewed earlier), focused on the rationality/irrationality of means (rather than goals), defined by the degree to which the means serve their intended objectives. However, Aaron Beck and Albert Ellis, both founders of the cognitive therapy approach to psychopathology, claimed that goals can also be irrational, if they are unrealistic or unattainable. According to Beck et al. (1979) and Ellis (1977) it is adherence to irrational goals that underlies the depression syndrome. Hence, cognitive therapies seek to identify irrational beliefs (e.g., I must be loved by everyone, and it is absolutely horrible if a person does not like me or I must succeed at everything I try, and it is horrible if I fail at a task) and replace them with rational and sustainable ones (e.g., I am disappointed if a person does not like me, but I can live with that). In their pursuit of rationality, cognitive therapists attempt to get patients to understand the irrationality of their beliefs and to help them set their sights on more attainable goals and less extreme construals of the implications of failure (Kruglanski, 1989a, p. 200).

THE LOGICAL CONSISTENCY PARADIGM: ON RATIONALITY AS COGNITIVE COHERENCE

Webster's dictionary (1986, p. 977) defines rationality as the quality or state of being agreeable to reason, or reasonableness. In turn, reason is defined as "something that supports a conclusion or explains a fact" (p. 981). In the philosophy of knowledge and of science also, rationality has been often equated with logical consistency (cf. Hempel & Oppenheim, 1949; Popper, 1959; Radnizky & Bartley, 1987). Hastie and Dawes (2001, p. 19) stated that "contradictory thinking is irrational thinking. A proposition about reality cannot be both true and false." Along these lines, Gintis (2007) epitomized rationality as the logical consistency of choices, defined in terms of preference transitivity. Specifically, "if an organism . . . , chooses action A over action B when both are available, and chooses action C over A when both are available, then it will also choose action C over B when both are available . . ." (Gintis, 2007, p. 4). In broader terms, choice consistency may be seen as a special case of *internal consistency* or coherence of individuals' beliefs. Similarly, rationality has been defined by the case when one's conclusion "accords (i.e., is consistent with) with the laws of probability" (Morris & Larrick, 1995, p. 331, parentheses added). As can be seen then, the logical consistency concept of rationality is naturally akin to notions of *Truth* or *probability*.

If logical consistency is the hallmark of rationality, it is of interest to ask whether persons in general are logically consistent, and in this sense rational. The inconsistency of human preferences has been hailed by many observers. Amos Tversky (1969) famously observed that individuals "are not perfectly consistent in their choices. When faced with repeated choices between x and y, people often choose x in some instances and y in others . . . (It seems) that the observed inconsistencies reflect inherent variability or momentary fluctuations in the evaluative process" (p.

31). Such fluctuations could arise because of the vagaries of knowledge activation. In other words, individuals' inconsistency of preferences (and judgments more generally) across instances could conceal consistency with knowledge activated at a given instance and constituting the available evidence from which individuals' local judgments are inferred.

A RELATIVITY THEORY OF RATIONALITY: ON CENTRALITY OF THE REFERENCE POINT

The logic of human inference is central to the *unimodel* of human judgment developed by Kruglanski and colleagues (Kruglanski, Erb, Pierro, Mannetti, & Chun, 2006; Kruglanski, Pierro, Mannetti, Erb, & Chun, 2007; Kruglanski & Orehek, 2007). According to this formulation, people's judgments are (logically) *consistent* with the evidence that they consider. In turn, evidence consists of information that fits, or constitutes a minor premise, to a prior conditional, IF THEN assumption or a major premise. The consistency here involves following the implications of one's prior assumptions, all the way to the implied conclusion. Thus, if one believes that X implies Y, and X is the case, Y being the case is consistent with the conjoined (major and minor) premises, and follows from them deductively. The unimodel argues that the consistency mechanism is involved in all cases of judgment and decision making, that it portrays all behavior in terms of rule following, and that it negates the presumption that rule following is qualitatively different from associationistic processes (Kruglanski, Erb, Pierro, Mannetti, & Chun, 2006; Kruglanski, Pierro, Mannetti, Erb, & Chun, 2007; for a similar implication see Holyoak, Kohl, & Nisbett, 1989).

According to the unimodel, the fundamental process whereby judgments are rendered is the same, though its contents may differ. For instance, some individuals may use statistically normative *rules* to reach their conclusions whereas others may rely on "fast and frugal" heuristics, that is, "*rules of thumb*" acquired through evolution or social learning (Gigerenzer, Hoffrage, & Goldstein, 2008, p. 232). Despite these differences in rule-contents, people's judgments in both cases are rule-based reflecting the same underlying process. Moreover, rule-following seems to underlie associatively based judgments involved in classical or evaluative conditioning. The notion that classical conditioning is rule-based or *propositional* is widely accepted in the conditioning literature (Holyoak, Koh, & Nisbett, 1989; Lovibond, 2003; Rescorla, 1985; Rescorla & Holland, 1982; Rescorla & Wagner, 1972). The same has been recently concluded about evaluative conditioning (Walther, Nagengast, & Trasseli, 2005; Mitchell, De Houwer, & Lovibond, in press).

For instance, whereas associative learning was originally assumed to constitute learning by contiguity and repeated pairing of a conditioned stimulus (CS) and an unconditioned stimulus (UCS), evidence from decades of conditioning research suggests that an animal rather than responding mechanistically to contiguous pairing of stimuli over repeated occasions is attempting to learn environmental contingencies in which the occurrence of one event (e.g., shock) is conditional on the occurrence of another event (e.g., noise). This formulation is reminiscent of Tolman's (1932) classic sign-learning theory whereby what is learned is an expectancy, or a conditional probability, that a given environmental sign (e.g., sound of

a bell) presages a given significate (e.g., food). According to Holyoak et al. (1989) in classical conditioning

Rules drive the system's behavior by means of a recognize-act cycle. On each cycle, the conditions of rules are matched against representations of active declarative information which we... term messages, rules with conditions that are satisfied by current messages become candidates for execution. For example, if a message representing the recent occurrence of a tone is active, the conditions of the above rule will be matched and the actions it specifies may be taken. (p. 320)

It is noteworthy that the rule assumed by Holyoak et al. (1989) is analogous to a major premise of a syllogism and the message is analogous to the minor premise, that is, instantiation of the antecedent in the major premise warranting the inference of the consequent term. Thus the rat's knowledge about the relation between tones and shocks might be informally represented by a rule such as "if a tone sounds in the chamber then a shock will occur. So stop other activities and crouch" (Holyoak et al., 1989, p. 320).

The unimodel then suggests that *locally* all human judgments are *rule driven* and hence consistent with (or inferred from) the (subjectively) available evidence. In this sense all judgments are (trivially) rational within their specific context. If so, then rationality assessments can only be meaningful as comparative judgments between contexts. In other words, meaningful rationality assessments should be relative to a transcendental reference point detached from the local judgment. As mentioned earlier, such reference point can be interpersonal representing someone else's perspective on the rationality of an individual's judgment, or intrapersonal representing the individual's own perspective albeit formed at a different time and/or place from the original context. In what follows we review discussions of rationality reflecting such interpersonal and intrapersonal viewpoints on targets' rationality.

ON THE RATIONALITY OF ACTIONS

Interpersonal Comparisons in the Means-Ends Paradigm. One person's rationality may be another's insanity both in terms of the end that a given act may be perceived to serve (e.g., the end's attainability, or desirability), and the act's (means') perceived instrumentality to those ends. To a materialist, whose end is the accumulation of wealth, the act of giving away one's possessions, e.g., the potlatch of the Kwakiutl of the Pacific Northwest, may appear irrational.² Yet from the Kwakiutl perspective, the act is fully rational in serving the (ends of) enhancement of the individual's status and prestige in his/her community (Boas, 1925; Codere, 1956). Similarly, a suicidal attack by a Jihadist terrorist may seem irrational to some observers in the sense that a person is violating the presumed basic human motivation for survival, yet it makes sense from the perpetrator's standpoint whereby it is a means to ends loftier than physical survival such as entrance into paradise and the eternal prestige of martyrdom (Atran, 2003; Kruglanski & Fishman, 2006;

2. Indeed, white missionaries and settlers were puzzled by the Indians' potlatch that they perceived as a frivolous and savage and effectively banned it in the late 19th century (Boas, 1925; Codere, 1956).

Kruglanski, Chen, Dechesne, Fishman, & Orehek, in press). In short, the interpersonal reference point is often used (or explicitly assumed) in rationality assessments. From this perspective, the concept of rationality does not have an *absolute* sense, but rather is *relative* to someone's subjective vantage point.

The rationality of goals may also be contested³ from an interpersonal perspective. For instance, adherence to the goal of becoming a major athlete, movie actor, or a scientific figure may appear as rational to an individual who believes in possessing the special personal qualities needed to attain those objectives, and as irrational to an observer whose assessment of the individual's relevant attributes is more modest.

Intrapersonal Comparisons in the Means-Ends Paradigm: The Self Control Dilemma. Because people's goals can be activated and inhibited by various environmental cues (for recent reviews see Fishbach & Ferguson, 2007; Morsella, Bargh, & Gollwitzer, 2009; Kruglanski & Kopetz, in press, a,b), a given act may appear rational at the time it is undertaken; yet when a different goal is activated to which that act was detrimental it may appear irrational and one might come to regret it. This issue is immanent in the self-control dilemma and the fundamental problem of succumbing to temptations (Fishbach, Friedman, & Kruglanski, 2003), representing the irrationality of sacrificing something more important (one's health, one's career, one's ethics, paradise) for something less important (a piece of chocolate, a drug, a drink, a sexual adventure, or in Adam and Eve's story, a measly apple!). Why would one ever do something as dumb as that? Classic self-control work, exemplified by Walter Mischel's (e.g., Mischel & Ebbesen, 1970; Mischel, Ebbesen, & Raskoff Zeiss, 1972; Yates & Mischel, 1979) research on the delay of gratification, emphasized the immediacy of the tempting stimulus, *The fierce urgency of now* to twist Martin Luther King's famous turn of phrase.

Because of its immediacy, the less important goal may loom large and become more important in the moment than warranted by its real worth for the individual.⁴ At the same time, the superior goal undermined by yielding to the temptation might be inhibited (Shah, Friedman, & Kruglanski, 2002). Indeed, Fishbach et al. (2003) found that unsuccessful self regulators tend to inhibit the superior goal when faced with a temptation. In contrast, successful self regulators tend to activate the superior goal in response to the temptation.

3. Whereas the present discussion suggests that goals may be contested on grounds of their seeming unattainability (or *expectancy* of their attainment), goals may be also contested on grounds of their undesirability (or *value*) (Kruglanski, 1996b). However, only the former, unattainability, issue seems relevant to rationality assessment and it has been treated that way in the literature (e.g., Ellis, 1962). One may consider a given goal (e.g., of dominance, or the accumulation of wealth) as undesirable from some ethical perspective, but one wouldn't call such goals irrational.

4. It is important to note that even though in much relevant research on self control the immediate goal (the temptation) was less important to the individual overall than the delayed or distant goal, it is not the proximity or distance that defines the self control dilemma but the relative importance of the goals pursued and sacrificed. Loss of self control is experienced if one sacrifices the less important goal for a more important goal. This may happen if the less important goal is more strongly activated in a given situation (is more salient) than the more important goal. Immediacy, is one factor that may determine degree of activation or saliency. However, distant goals (delayed rewards,) aren't *invariably* more important to the individual than immediate goals (rewards. To disentangle the immediacy and importance dimensions Kruglanski & Kopetz (in press) recently manipulated them orthogonally. It was found, as hypothesized, that perceived control varied as function of the perceived relative importance of the goal pursued and not as function of its immediacy.

In what sense is loss of self control irrational? Recently, Kruglanski and Kopetz (in press) proposed that to understand the irrationality entailed by yielding to a temptation it is useful to distinguish between an *underlying goal hierarchy* and an *effective goal hierarchy*. An underlying goal hierarchy can be considered a central tendency in one's relative goal values around which such values may exhibit momentary fluctuations. It is one's true goal hierarchy that one subscribes to in temptation-free moments. In contrast, an effective goal hierarchy depends on the momentary activation of various objectives and that can be, therefore, heavily biased by salient low importance goals referred to as temptations. Succumbing to a temptation may be momentarily rational relative to one's effective goal hierarchy yet quite irrational in reference to one's underlying goal hierarchy. For instance, at a moment of severe hunger when concerns about dieting are conveniently suppressed, the only salient goal may be that of eating, and any means that serves that purpose might be rationally adopted (Kopetz et al., 2008). Yet later on, when the individual's underlying goal hierarchy is reinstated he or she might regret yielding to the temptation, and come to view her/his former action as irrational in that it undermined (hence was inconsistent with) her/his truly important objective.

In summary, an activity that appeared reasonable at a given moment, and under a given constellation of active objectives, might appear irrational once that constellation has shifted. Whether depending on an internal, or intra personal versus interpersonal point of reference the judged rationality of actions appear to be relative (to a reference point) rather than absolute.

ON THE RATIONALITY OF JUDGMENTS

On Seeming Irrationality of Tribal Cultures. As with rationality of actions, the reasonableness of judgments has often been assessed from someone else's perspective. In other words, rationality has tended to be assessed interpersonally in terms of *consistency with premises* that the assessor (but not necessarily the target assessed) subscribed to. A prominent example was the debate in early twentieth century anthropology as to whether tribal cultures think magically (i.e., irrationally), as compared to the rational and logical thinking ascribed to Western cultures (see Kruglanski, Dechesne, & Chun, 2004). Lucien Levy-Bruhl (1910/1966, 1923/1966), the French philosopher and sociologist drew the distinction between primitive (magical, prelogical) and civilized (scientific, logical) modes of reasoning. Levy Bruhl's notion that tribal cultures are less rational than Western civilizations was opposed by eminent anthropologists, and cognitive psychologists such as Boas (1991), Levi-Strauss (1966), Bartlett (1923), and Kohler (1961).

Bartlett, in particular, maintained that the reasoning of members of primitive and modern societies rests on common characteristics. As he put it: "... If we ... turn our attention to the practical inventiveness of primitive man in regard to the search for food, the provision of dwellings, and the development of material arts, it appears that he is as capable of learning from experience as the most cultivated of our contemporaries. Moreover, within these realms he learns from experience in exactly the same way as we do ... " (Bartlett, 1923, pp. 284-285).

Levi-Strauss (1963, 1966) also criticized the notion that different cultures vary in their way of reasoning and judging. All to the contrary, he maintained that the human mind works in the same ways irrespective of culture, or historical period.

Primitive and civilized thought systems proceed in the same way to create coherent knowledge of the universe, though they may use different categories and concepts for that purpose. According to this view, "observed differences (among cultures) are in the area of *content*: the belief systems and cultural premises of traditional people may differ from those in industrialized societies, but they embody the same logical processes . . ." (Cole & Scribner, 1974, p. 25). The view that members of different cultures share the same reasoning process is now widely accepted among cultural anthropologists. Levy Bruhl, who early on championed the qualitative distinction between primitive and civilized thought, abandoned it in time on force of the arguments against it. In his notes, published ten years after his death (i.e., in 1949) he admitted to having erred in this regard, and proposed instead the existence of two modes of thought, one *rational* and the other *imaginative* assumed to be present in each society. This notion, that members of all societies are capable of different modes of thought is a precursor of the *dual mode* theorizing that swept social and cognitive psychology in the last decades (for review and critique see Kruglanski et al., 2006; Kruglanski, Pierro, Mannetti, Erb, & Chun, 2007).

The Irrationality of Heuristics and Biases. In contrast to the foregoing consensus that admits the subjective nature of rationality (qua consistency), the psychology of judgment and decision making has tied irrationality to deviations from premises and assumptions held as (objectively) correct or normative. This line of thought underlies the influential work on heuristics and biases (Kahneman, 2003; Kahneman & Tversky, 1973; Tversky & Kahneman, 1974). The central issue has been the degree to which people employ the correct means for attaining the major goal of judgment (presumably accuracy). According to Gigerenzer and Goldstein (1996, p. 650) Tversky and Kahneman's work (see, e.g., Kahneman, Slovic, & Tversky, 1982) takes the classical view of rationality as the ideal from which humans often deviate. In their heuristics and biases approach departures from (or inconsistency with) statistical precepts defines a reasoning error, and hence a type of irrationality. Implicit in this view is the idea that the normative statistical models, if relied upon, will in some sense yield superior inferences than the suboptimal heuristics, that is more valid or veridical inferences.

Gigerenzer emerged as an uncompromising critic of Tversky and Kahneman's approach. He argued that the classical view of inference that portrays the statistical model as the ideal rationality framework is misplaced in reference to single events. As he put it: ". . . probability theory is imposed (in this approach) as a norm for a single event . . . ; this would be misguided by those statisticians who hold that probability theory is about repeated events . . . Kahneman and Tversky . . . have subscribed to a controversial doctrine that indiscriminately evaluates all statements about single events by the laws of probability" (Gigerenzer, 1996, pp. 292-293). According to Gigerenzer's argument, it isn't at all agreed that probability theory, at least in the view of probability as relative frequency (Fisher, 1935, 1956) identifies the correct algorithm to determine the probability of a discrete event.

In short, the inter-personal reference point relative to which the rationality of human inferences was assessed has occasionally appeared in the human judgment literature. According to this view, rationality was viewed as consistency with premises that the assessor held to be valid (e.g., the Western belief system, probability theory), and departures from those premises was seen to denote irrationality.

Logical Consistency Issues in Social Cognition. The issue of (logical) consistency within individuals' belief systems received considerable attention from social cognitive theorists and researchers (e.g., Festinger, 1957; Heider, 1958; for a source book see Abelson, Aronson, McGuire, Rosenberg, & Tannenbaum, 1968). The fundamental assumption at base of the consistency paradigm is that people pay attention to the logical consistency of their various beliefs (Abelson et al., 1968), and that they experience aversive tension upon encountering an inconsistency, motivating cognitive efforts aimed at inconsistency reduction.⁵

If logical consistency is the touchstone of rationality, the cognitive consistency theories imply that people in general are rational (as they are bothered by inconsistency). Recently, however, Nisbett, Peng, Choi, and Norenzayan (2001) have argued that different cultures vary in the degree to which they care about and exhibit logical consistency. These authors contended that Western and Eastern thought processes fundamentally differ, the former being analytic hence bound by considerations of logical consistency, the latter being holistic hence less committed to consistency. Analytic thought is object focused, attending to the categories to which the object belongs and using rules, including formal logic, to understand its behavior (Nisbett et al., 2001, p. 291). By contrast, holistic thought attends to the entire field, "assigning causality to it, making relatively little use of categories and formal logic, and relying on 'dialectical' reasoning" (p. 291).

Nisbett and colleagues (2001) report data from a variety of domains which they interpret in terms of the analytic/holistic distinction. For instance, they predict and find that East Asians are more accurate at detecting covariation than are Americans and they view this as evidence that Asians are better at perceiving relationships within the field, attesting to greater attention they pay to the field in general. Furthermore, because of their attention to the entire context, Asians (vs. Americans) are expected to find some explanation for any given outcome. As a consequence, Nisbett et al. (2001) suggest and present results that Asians should be less surprised by unexpected outcomes than are Americans, and more susceptible to hindsight bias (Choi & Nisbett, 2000).

Other data, however, suggest that members of Eastern cultures aren't necessarily insensitive to contradiction. For instance, Hishono-Browne et al. (2005) demonstrated that Easterners do experience post-decisional dissonance if the decision is of consequence to them. In the relevant experiment, participants were presented with a menu from a Chinese restaurant. Participants were either asked to rank the top 10 dishes according to their preferences or according to a close friend's preferences. Then, participants were given the option of a gift certificate for the 5th- or 6th-ranked choices. When participants ranked the options according to their own preferences, they were given a gift certificate with their name on it. When the rankings were done according to another person's preferences, that person's

5. It is of interest that the results of inconsistency (e.g., dissonance) reduction are typically viewed as rationalizations, a species of irrationality. This despite the fact that inconsistency reduction (by definition) increases consistency and coherence in one's cognitive system. Our relativity theory of rationality affords an insight into this seeming paradox. What we have here is irrationality as assessed from an interpersonal perspective. Specifically, inconsistency reduction typically results in cognitive distortion, or (unconscious) attitude change away from one's original position; the latter attitudinal position is known to the *observer* yet is misremembered by the *actor* (Bem, 1972). Thus, the new coherence brought about by inconsistency reduction represents a local *rationality* for the *actor*; yet the very same coherence entails an inconsistency for the *observer* between what she/he knows to have been the actor's attitude and what the actor now asserts to be that attitude.

name was written on the gift certificate and the participant was instructed to give the gift certificate to that person. The results indicated that Easterners exhibited cognitive dissonance effects when they made a decision for another person. When they selected a gift certificate on behalf of their friend, they later exaggerated the favorability of this choice in comparison to the gift certificate that was not chosen. In contrast, Western participants exhibited cognitive dissonance effects when they made the decision for themselves, but not when they made the decision for another person.

In a different set of studies, Kitayama, Conner Snibbe, Markus, and Suzuki (2004) found that Easterners exhibited cognitive dissonance effects when they were primed with the presence of interpersonal cues, whereas Westerners exhibited cognitive dissonance effects regardless of interpersonal cues. Specifically, participants ranked 10 CDs according to their preferences, and were given a choice between their 5th- and 6th-ranked choices. To prime interpersonal cues, two studies asked participants in one condition to additionally rank the CDs as the average college student would. Study 3 asked participants to rank the CDs according to the preferences of either a liked other or a disliked other. Study 4 primed interpersonal cues by hanging illustrations of several facial outlines above the surface in which participants completed their questionnaires. Across the 4 studies it was found that when others were primed, Easterners exhibited cognitive dissonance effects by exaggerating their liking for the selected CD as compared to the non-selected CD.

Error Correction. A shift in one's reference point may lead one to consider a prior judgment as inconsistent with known fact. Persistence with the former judgment would, therefore, be irrational from the new perspective. Consistent with our assumption that human judgments are locally rational, ample research suggests that awareness of an inconsistency with newly revealed facts results in attempts to correct one's errors. For instance, one might evaluate a target person in terms of information later revealed to be false, upon which the perceiver may appropriately alter her or his judgment. In this vein, Chun, Spiegel, and Kruglanski (2002, Study 3) found that invalidating information on which basis a prior judgment was made may alter that judgment where the task required the actor's conscious attention to its details. However, when the task was easy, and hence performed in an automatic manner, the relevance of the invalidating information to the judgment wasn't noticed and the judgment wasn't altered.

Often, a correction might be made before an error has actually occurred based on the perceiver's theory of circumstances that may induce bias. A substantial body of research in social cognition has addressed the issue of bias correction (see Petty, Brinol, Tormala, & Wegener, 2007). Petty and Wegener's (1993) flexible correction model suggests that individuals "correct their judgments in different directions when they hold theories of opposite biases." (Petty et al., 2007, p. 271). Intriguingly, "People correct for biases they believe exist, even if there is no real bias This can create the opposite bias, as when correction for perceived negativity toward the dislikeable source of a persuasive message leads that source to be more persuasive than a likable source . . ." (p. 272). In short, people's attempts to be consistent with locally available knowledge (including their lay meta-cognitive theories) may often lead them to correct what they perceived as their past or potential future errors.

Belief Interconnectedness? The conception of rationality as logical consistency raises the question of interconnectedness between elements of people's belief systems (for discussions see e.g., Abelson et al, 1968; McGuire, 1968). The issue addressed by early social cognition theorists was whether *all* implications of one's beliefs are immediately accessible to consciousness? Even William McGuire (1968), who believed in the essential interconnectedness of human beliefs, admitted that his view is probably exaggerated. As he put it "I have perhaps over-intellectualized the degree of interconnectedness in human thought, having committed the pathetic fallacy of judging others to be too much like myself (p. 156)." In the same volume, Abelson and colleagues (1968) confessed his skepticism about connectedness stating that he is "... increasingly coming to believe that highly ramified cognitive structures are relatively rare, occurring mainly among those with a heavy ideological or personal investment in a particular belief area . . ."

Knowledge Activation. The issue of beliefs' interconnectedness bears a strong relation to the topic of knowledge activation (Higgins, 1996; Forster & Liberman, 2007). The basic distinction in this domain is that between the *availability* and *accessibility* of cognitive constructs. Availability refers to the cognitions' mere existence in one's memory store, whereas accessibility refers to the "activation potential of available knowledge . . ." Higgins (1996, p. 134). According to Higgins: "This captures the characteristics of accessible knowledge that it is capable of being activated and then used." Higgins' (1996) analysis of knowledge activation suggests a sense wherein a person may consider her or his prior judgment as irrational from a vantage point of alternative available beliefs that were inaccessible at the time that judgment was made.

Consider from this perspective, the biases and heuristics notion of base-rate neglect (Kahneman & Tversky, 1973) whereby contrary to the dictates of the Bayesian model (Edwards, Lindman, & Savage, 1963) people often ignore their priors, and render their judgments independently of their previous beliefs. According to the present analysis, whether the base-rates are neglected depends on general factors of knowledge activation that determine whether any relevant information would or would not be neglected (cf. Chun & Kruglanski, 2006). In other words, knowledge activation principles apply equally to cases where the base rates are neglected and those where they are taken into account. They characterize the general judgmental processes whereby human judgments are consistent with some (accessible) but not all (available) evidence.

Bounded Rationality. The notion that not all knowledge available in memory is immediately accessible may be considered a limitation of the human cognitive system affording the possibility of "irrational" judgments inconsistent with *available* though momentarily *inaccessible* information. Presumably, the activation of available knowledge requires cognitive resources that are finite and limited. The notion of limited mental resources is central to Herbert Simon's (1991) concept of *bounded rationality* referring to the fact that human computational resources are finite, and hence that individuals might reach judgments and undertake decisions that would be less than completely rational in the sense of potential inconsistency with what might have been one's judgment/decision if one's resources were more ample. Once again, judged rationality appears to be relative to some reference point; in this case such reference point constitutes a judgment that, perhaps, could have been reached under superior resources.

There is a sense in which the notion of bounded rationality is open ended: An improved judgment that potentially could be reached under augmented resources (serving as a reference point with respect to which a current judgment is assessed) could itself be inconsistent with an even better judgment if more resources yet were made available. More intriguingly yet, additional resources need not result in an improved judgment. Specifically, even though one's cognitive resources might have been increased one might have missed some critical information, or one might have been led astray by irrelevant or false information (Kruglanski, 1989b). Thus, further enhancement of resources could lead one to opt for an earlier judgment rendered at time 1 under highly limited resources, over a later judgment rendered at time 2 under more ample resources if the latter resources were misapplied.

Unbounded Rationality? The notion of bounded rationality might be taken to imply that there exists such a thing as full, complete, or unbounded rationality. It is rather difficult to imagine, however, what the latter might amount to. Particularly problematic is the concept of complete knowledge that the notion of unbounded rationality seems to imply. Such concept assumes a static and finite store of knowledge that exists somewhere to be possessed. But contemporary notions of human knowledge, including scientific knowledge, portray it as dynamic and continually evolving in a process consisting of conjectures and refutations (cf. Popper, 1959; Kuhn, 1962; Feyerabend, 1975). In these terms, far from their being fixed or finite, choice options are tentatively constructed, and perennially open to revisions and alterations. In this sense, the notion of unbounded rationality is incoherent and inapplicable to the human condition. It suggests an omniscient being whose attainment of the best possible outcomes is assured by definition, and hence is tautological, stemming as it does from complete knowledge as to where such outcomes are and how to find them. But if the concept of unbounded rationality is incoherent so is the notion of bounded rationality that assumes it as a reference standard. If no *fixed* amount of knowledge exists, because knowledge is dynamic and constantly evolving, then the notion of *partial* knowledge doesn't make sense either. All one is left with is the general notion that humans are trying to reach the best judgments possible and that such judgments may be subsequently regretted and viewed as erroneous.

IS RATIONALITY IMPROVEMENT POSSIBLE?

We have argued that rationality assessment, bestowing grades of rationality, seems meaningful only relative to some external (transcendental) reference point or standard of comparison. That is so because in the local instance, all judgments are consistent with active knowledge, hence all are (trivially) rational. In the means-ends framework, the standard of comparison could be a means that is demonstrably better on some criterion (e.g., of efficiency or likelihood of goal attainment) than another means. In the logical-consistency framework, the standard of comparison could be a judgment that is more consistent with some body of knowledge than its counterpart.

From this perspective, improving rationality may be thought of as getting the individual to adopt the correct means or to make the correct judgment. For in-

stance, the irrationality or sub-rationality inherent in use of the representativeness heuristic (Tversky & Kahneman, 1974) could be removed by teaching individuals the normative (hence arguably more rational) statistical calculus. Indeed, research (Nisbett, Cheng, Fong, & Lehman, 1987; Sedlmeier, 1999) has established that statistical reasoning can be taught and statistical principles can be rendered more chronically accessible. This can result in the increased use of statistical rules. As Sedlmeier (1999) summarized it, "The pessimistic outlook of the heuristics and biases approach cannot be maintained . . . Training about statistical reasoning can be effective . . ." (p. 190).

More generally, rational choices or judgments can be imparted to individuals by effecting in them the proper cognitive change, through teaching and persuasion. Effectiveness of the latter methods may depend on the information given to the recipient and its recognized relevance to this individual's major premises or inference rules (Kruglanski, Pierro, Mannetti et al., 2007). Recognition of relevance, in turn, may depend on the difficulty of the information processing task, individuals' cognitive resources needed to surmount the difficulty and the individuals' (degree and type of) motivation to engage in information processing. Individuals' inference rules may derive from the epistemic authority of various sources including oneself (Kruglanski et al., 2005). To the extent that an individual's self ascribed epistemic authority in a domain was high he or she may be able to effectively learn from experience (Ellis & Kruglanski, 1992) and to derive rules from observed patterns of covariation between stimuli. In turn, acquiring the correct rule may afford more rational choices and judgments.

In the realm of self-control, for example, Fishbach, Friedman, and Kruglanski (2003, see also Papiés, Stroebe, & Aarts, 2007) found that successful self regulators activate the superior goal when confronted with a temptation (that threatens the goal's accomplishment). This can be thought of as an acquisition of a contingency rule of the kind "If (confronted with a) temptation then (activate the superior) goal." In turn, activating the superior goal may inhibit the temptation and allow the individual to overcome it (Geyskens, Dewitte, Pandelaere, & Warlop, 2008). To the extent that succumbing to temptation is seen (from the individual's own transcendental reference point) as a kind of irrationality, such learned patterns of activation and inhibition may be seen as rationality improvements. Principles of knowledge activation (Higgins, 1996) are pertinent here as well. Specifically, a given inference rule may be available in the individual's memory yet inaccessible at a given moment and hence incapable of fostering the rational judgment or decision. Thus, the accessibility of a rule constrains its ability to be applied at a given instant.

Finally, it is important to consider the general psychological conditions that may facilitate or impede new learning required for movement from less to more rational choices (in the means-ends paradigm) or beliefs (in the logical consistency paradigm). For instance, the need for cognitive closure (Kruglanski, 1989a, 2004) may promote the freezing on prior beliefs hence induce a resistance to change (Kruglanski, Pierro, & Higgins, 2007) impeding the shift to rationality. Subscription to a *mastery* versus *performance* orientation (Dweck, 1999) may respectively facilitate or impede learning. In turn, mastery and performance mindsets may derive from individuals' lay theories regarding the malleability versus fixity of human traits (such as intelligence, for example) (Dweck, 2006). The need for cognition (Cacioppo & Petty, 1982) or the locomotion tendency (Kruglanski, Thompson et al., 2000;

Kruglanski, Pierro, & Higgins, 2007) may promote change, including one toward greater rationality as defined from a given perspective or reference point, etc.

RECAPITULATION AND CONCLUSION

In the present paper, we offered a thumbnail sketch and analysis of the concept of rationality in human affairs. From the time of the Early Greek philosophers to the present, the term rationality and its derivatives (e.g., the notion of "rational choice") have been used ubiquitously both in popular discourse and in social science discussions and debates. Nonetheless, the rationality notion as such has been subjected only rarely to a careful scrutiny and explication. The purpose of the present essay was to address this gap in understanding. We began by distinguishing between two general senses in which the term rationality has been used by various thinkers on this topic, represented by the (intertwined) *means-ends* and *logical consistency* frameworks.

Our relativity theory of "rationality" is based on the assumption that all human judgments and behavioral choices are coherent in the restricted, local, sense of the term. Judgments are invariably based on (hence are coherent with) momentarily accessible evidence (Kruglanski et al., 2007a) as are behavioral choices. From the local perspective, or the psychology of the moment, any means one chooses appears as the best means (so far as one could tell), and any judgment one reaches appears as the most valid judgment. In other words, from the local perspective, all our choices and judgments are locally rational; this means that rationality assessments (assuming differences between degrees of rationality) can only have meaning transcendentally from a reference point outside the particular moment. A local means choice can be considered irrational relative to another, better means choice identified by someone else, or by the same individual at a different time or place. The former represents an interpersonal reference point to which a means choice or a judgment are relativized, and the latter, an intrapersonal reference point.

Our relativity theory of rationality implies that the *process* of reaching judgments and decision is uniform across the multitude of instances in which it operates (cf. Kruglanski et al., 2007). It further implies that the notion of rationality is to be applied to judgmental or decisional *outcomes*, rather to the decision *process*. In other words, depending on the specific inputs the very same general process may result in rational or irrational outcomes. This perspective is consistent with Fiedler's *informational ecology* approach whereby errors (e.g., of overconfidence, or availability) are due to sampling biases, or informational inputs into the same inferential process, rather than to different (e.g., less or more rational processes; Fiedler, 2000; Fiedler & Waelenke, in press).

From the present theoretical perspective, it is possible to improve people's rationality and such improvements amount to getting people (through the process of teaching and persuasion) to make the correct or rational means choices or to reach the correct or rational judgments. The psychologies of judgment formation, knowledge formation and motivational orientation could be profitably used to foster such shifts to greater (albeit relative!) rationality. In this transcendental sense then, the language of rationality is intelligible and meaningful.

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