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## The Rational Patient and Beyond: Implications for Treatment Adherence in People with Psychiatric Disabilities

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### Abstract

**Purpose/Objective**—Many people with psychiatric disabilities do not benefit from evidence-based practices because they often do not seek out or fully adhere to them. One way psychologists have made sense of this rehabilitation and health decision process and subsequent behaviors (of which adherence might be viewed as one) is by proposing a “rational patient;” namely, that decisions are made deliberatively by weighing perceived costs and benefits of intervention options. Social psychological research, however, suggests limitations to a rational patient theory that impact models of health decision making.

**Design**—The research literature was reviewed for studies of rational patient models and alternative theories with empirical support. Special focus was on models specifically related to decisions about rehabilitation strategies for psychiatric disability.

**Results**—Notions of the rational patient evolved out of several psychological models including the health belief model, protection motivation theory, and theory of planned behavior. A variety of practice strategies evolved to promote rational decision making. However, research also suggests limitations to rational deliberations of health. (1) Rather than carefully and consciously considered, many health decisions are implicit, potentially occurring outside awareness. (2) Decisions are not always planful; often it is the immediate exigencies of a context rather than an earlier balance of costs and benefits that has the greatest effects. (3) Cool cognitions often do not dictate the process; emotional factors have an important role in health decisions. Each of these limitations suggests additional practice strategies that facilitate a person’s health decisions.

**Conclusions/Implications**—Old models of rational decision making need to be supplanted by multi-process models that explain supra-deliberative factors in health decisions and behaviors.

## Keywords

health decision making; implicit attitudes; cold cognitions

There is compelling evidence supporting several practices as state-of-the-art rehabilitation for people with psychiatric disabilities stemming from serious mental illnesses such as schizophrenia, bipolar disorder, and major depression (Corrigan, Mueser, Bond, Drake, & Solomon, 2008). In the past decade, coalitions of researchers supported by SAMHSA (Hennessy & Chambers, 2009), Johnson and Johnson (Drake, Becker, Goldman, & Martinez, 2006) and NIMH (Dixon et al., 2010) have identified several evidence-based practices (EBPs) including medication management, assertive community treatment, supported employment, permanent supportive housing, family education and support, illness management and recovery, and integrated treatment for co-occurring disorders. Unfortunately, many people with psychiatric disabilities who might benefit from these practices do not seek them out when in need. Many who do begin treatment decide to end it prematurely.

One way behavioral scientists have made sense of poor treatment adherence is positing people as rational actors making carefully considered decisions about health care options and wellness. In this light, “rational patients” are viewed as coolly and solely weighing costs and benefits in a prior and planful manner. Counseling strategies including shared decision making and motivational interviewing help the person with the deliberative process. However, there may be limits to the model; we propose and review three supra-deliberative processes in this paper. (1) Although it seems that rational patients make “conscious” comparisons of the advantages and disadvantages of treatment decisions, many real-life decisions are made implicitly and out of awareness. (2) Rather than planning with foresight, rehabilitation and treatment decisions are often influenced by immediate exigencies. It is not the consideration on Monday that leads to whether the person takes medication Thursday afternoon, but more likely salient issues from Thursday morning. (3) The idea of the rational patient suggests cold and calculated decisions when in fact many of these are emotional enterprises. We review the supra-deliberative factors herein by summarizing evidence that expands the narrow assertion about the rational patient into more complex behavior representing the multifaceted experience of adherence. The review includes examination of strategies shown to enhance health decision making in these different ways.

Critiques of rational patient models are neither new nor innovative in terms of human behavior in general or health behavior *per se* (Bickel & Vuchinich, 2000). Sociologists, economists, and game theorists have explained help seeking behavior beyond a simple rational process. Still, the idea of the rational patient remains strong. For example, the Adherence Research Network, begun in 2010 by the National Institutes of Health, lists rational models most prominently among its strategies to influence treatment decisions. Hence, we do not believe rational patient models have been dismissed at least not from the real-world practice setting. We begin the paper by briefly reviewing the literature on treatment adherence and mental health disabilities, in the process highlighting both the complexity of and problems with the construct. We then summarize rational actor models

that describe these kinds of decisions and segue to a review of strategies meant to enhance deliberation related to treatment and rehabilitation.

We contrast these models with behavioral economic and other critiques that have been extended to adherence. We organize the next section of the paper in terms of limitations to rational patient models; this section includes tentative proposals for how adherence might be augmented should these limitations be further supported by research. We end by considering what these alternatives mean for ongoing study of treatment adherence as well as other health decisions and behaviors. We use the term patient with significant hesitation in the paper acknowledging the benefit of person first language in the rehabilitation literature. We chose to stick with “rational patient” at places because it reflects the relatively unidimensional perspectives of the medical model from which deliberative perspectives on adherence largely emerged.

## Understanding Treatment Adherence

It is almost an axiom of health services and sciences that many people do not adhere to treatment. The World Health Organization (2003), Institute of Medicine (2008), and U.S. Surgeon General (1999) have all identified treatment adherence among topmost priorities in the real world use of evidence-based therapies and rehabilitation. Operational definitions of adherence differentiate care seeking (i.e., Does a person seek out a physician or other health care provider when symptoms and disabilities become distressing and the person is in need of services?) from service participation (Does the person remain actively engaged in treatment once it begins?). Poor treatment adherence is ubiquitous across medical conditions and disabilities: cancer (Partridge, Wang, Winer, & Avorn, 2003); heart, lung, and blood disease (Fung, Huang, Brand, Newhouse, & Hsu, 2007); childhood conditions (Celano et al., 2010); neurological and psychiatric illnesses (Gilmer et al., 2004); alcohol and substance abuse (Terra et al., 2006); and allergy and infectious diseases (Remien et al., 2005). Although adherence typically refers to peoples taking *medications* as prescribed, researchers now recognize it impacts most other clinical disciplines and related treatments (Shumaker, Ockene, & Riekert, 2009). Many recipients of surgical interventions, for example, ignore pre- and post-op tests and procedures (Stephens et al., 2009). People with orthopedic disabilities forget physical rehabilitation (Brewer et al., 2004).

The problem in treatments for people with serious mental illnesses seems especially bleak. Researchers have summarized the issue well elsewhere (Kreyenbuhl, Nossel, & Dixon, 2009; Velligan et al., 2009, 2010a); interesting findings from there are summarized in Table 1. Prominent among these is research from the Epidemiologic Catchment Area Study (Narrow, Regier, Rae, & Manderscheid, 1993), the National Comorbidity Survey (Kessler et al., 2001), and the National Comorbidity Survey Replication (Kessler & Merikangas, 2004) that show 30 to 40% of people who might benefit from psychotropic medication fail to seek it out. Findings from literature reviews and national surveys by the Schizophrenia Patient Outcome Research Team examined participation in psychiatric rehabilitation services (Dixon et al., 2010; Lehman et al., 1998). Although more than 90% of individuals in the survey reported receiving maintenance neuroleptic treatment, less than half acknowledged participation in any psychosocial services, less than a quarter were involved in family

therapy, and only about 10% received some variation of assertive community treatment. Dropout is an important indicator of nonadherence. Recent findings from the Clinical Antipsychotic Trials Intervention Effectiveness (CATIE) schizophrenia study showed that 74% of research participants dropped out of a medication trial during the 18 months of the study (Lieberman et al., 2005; Stroup & Appelbaum, 2006). Another index of service participation is failure to attend outpatient appointments. McCarthy et al (2007) showed as many as 25% of veterans with schizophrenia or bipolar disorder had one or more gaps in contact. Data from the NCS-Replication showed a similar overall 25% dropout rate from mental health treatment with significantly worse rates for those with marked disabilities (Olfson et al., 2009).

Despite these adherence rates, failing to fully engage in treatment is not a problem of mental illness alone. The bottom half of Table 1 includes adherence to medication rates for some physical illnesses. Up to 60% of those struggling with illnesses related to cancer, heart disease, and childhood asthma did not comply with medication prescriptions or doctor's visits.

At the most obvious, poor adherence worsens morbidity and mortality which directly harms people with psychiatric disabilities. But its effects reach far beyond symptoms and illness course. Poor adherence exacerbates psychiatric disabilities undermining family relationships, work, and other social responsibilities including parenting and wage earning. Nonadherence taxes limited health resources that could be used better elsewhere. It stymies innovation. It adds to health provider burnout. For some conditions, it may imperil the public including increased crime and unnecessary accidents.

One way to expand discussion on adherence is to recognize it as one example of the broader set of decisions and behaviors related to a person's pursuit of health and wellness. Adherence is both a decision (Yes, I will meet with my job coach today.) and a behavior (The person and job coach actually come together at a prospective job site.). Hence, research and theory should focus not only on whether the person is doing what he or she *should*, but also on processes that affect independent decision making and behaviors related to health. This broadens the discussion to include insights from psychological models related to decision making which we use in the next section to make sense of the hypothesized rational patient.

## Models of Rational Patients

Several theories have developed to explain adherence as a rational process -- the person making health decisions based on the balance of perceived costs and benefits; these are briefly summarized in Table 2. More than 50 years ago, the health belief model (HBM) was posed by health care providers and services researchers as a decisional process influenced by weighting and contrasting the harm of a clinical condition and the benefits of available treatments (Champion & Skinner, 2008; Rosenstock, 1966, 1974). Clinical harm was defined as perceived susceptibility (the likelihood that an individual will contract a condition) and perceived severity (the impact of a condition as measured by symptoms, quality of life, and disability). Although HBM was developed long ago and has attracted

careful and comprehensive critiques since (Stroebe & Strobe, 1995), it continues to be incorporated into contemporary research in health psychology because it is an effective heuristic for research. Closely related to HBM is protection motivation theory (PMT, Armitage & Conner, 2000; Rogers, 1983). In PMT, health behavior is framed as adaptive or maladaptive coping which is determined by protection motivation. This kind of motivation is influenced by threat appraisals (like HBM, based on perceived vulnerability, severity of illness, and depth of disability), and coping appraisals which interjects social learning constructs such as self-efficacy. Meta-analyses completed on HBM (Harrison, Mullen, & Green, 1992) and PMT (Milne, Sheehan, & Orbell, 2000) yield small to medium effect sizes in their explanation of health decisions.

Research on human decision making in general is also relevant. According to Bandura's (1977) social learning theory, it is not the assortment of past reinforcing and punishing consequences of a health behavior that influence adherence but rather how past learning has been experienced and the expectations those experiences engender. Bandura (1986) further elaborated on social learning effects with the idea of self-efficacy. Self-efficacy represents confidence in one's ability to carry out specific behaviors in specific settings. The Theory of Reasoned Action seems to be a more direct social learning perspective relevant to understanding health decisions and behaviors (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). Like previous theories, the Theory of Reasoned Action proffers positive and negative evaluation of a behavior as central to moving ahead on said behavior. The Theory also suggests perception of *social norms* as an equally important element of reasoned action; namely, recognition of an important other's preference vis-à-vis health behavior moderates the person's decisions. Ajzen (1988) conceded that the Theory of Reasoned Action was limited to volitional behavior and developed the Theory of Planned Behavior by adding notions of perceived control. Perceived control represents actual management in a specific setting and a measure of confidence in one's ability in that setting (similar to self-efficacy). Findings from a meta-analysis of 96 studies of the Theories of Reasoned Action and Planned Behavior specifically for adherence yielded moderate to high effect sizes (Albarracin, Johnson, Fishbein, & Muellerleile, 2001).

### Critiques of Rational Patient Models

Sociologists have developed several theories that explain help seeking behavior beyond rational processes (Friedman & Hechter, 1988; Lindenberg, 1985). Pescosolido (1992) outlined helping behavior via social networks and help seeking episodes. Accordingly, it is not the solo, planful consideration of contingencies that drive adherence but rather the dynamic, often immediate, and sometimes "irrational" products of social networks from which health decisions and behaviors evolve (Smith & Christakis, 2008). Theories and research from behavioral economists have provided more specific, cognitive analyses of the rational patient (Luce, 2000; Simon, 1987). They have argued that people often rely on cognitive shortcuts which may not be the most "rational" but serve the perceived needs of the moment (Volpp, Friedman, Romano, Rosen, & Silber, 2010). For example, research by Kahneman and Tversky (1979) on cognitive heuristics shows decisions and corresponding behaviors often rest on "approximate" rules of thumb rather than strict logic. The availability heuristic -- the notion that "truth" reflects the simple exposure to a phenomenon

(Tversky & Kahneman, 1973) -- offers a compelling example: a person believes cigarette smoking is not health-threatening because “my father smoked two packs a day for 50 years.” Although these models have not been as widely applied to health decisions (and even less so to questions of adherence), they are an important and growing research paradigm.

### How to Influence the Rational Patient

In some ways, then, critiques of the rational patient model might seem like old news; that understanding adherence from the perspective of HBM and TPB is dated. And perhaps this is true from the theoretical perspective of basic behavioral scientists. But a different picture emerges when considering research regarding how to influence services and health decisions. Findings from systematic reviews and meta-analyses looking at impacting adherence related to HIV-AIDS (Simoni, Pearson, Pantalone, Marks, & Crepaz, 2006), childhood illnesses (Graves, Roberts, Rapoff, & Boyer, 2010), disorders in older adults (Conn et al., 2009), and psychiatric disability (Gaudiano, Weinstock, & Miller, 2008; Velligan et al., 2010) showed interventions grouping into two clusters: those meant to influence deliberation (the rational patient *per se*) and those meant to augment deliberation such as psychoeducation, time management, provider communication skills, medication monitoring, and cognitive remediation. These are the practical strategies for augmenting deliberative processes related to health decision making. Two of these are described here: shared decision making and motivational interviewing.

Shared decision making (SDM) was developed to address treatment adherence by public health and medical providers (Edwards, Davies, & Edwards, 2009; Joosten et al., 2008). It frames health decisions as basically an exchange between person and health provider with three components. (1) Heeding the rational patient, the dyad attempts to identify advantages and disadvantages of a specific health behavior. (2) This often requires education about the illness and corresponding treatments. Various channels have been used to provide this information with research on internet applications and social networks being especially promising in the past couple of years (Tanis, 2008). (3) SDM is fundamentally social exchange so counseling skills that enhance engagement are important. These include active listening skills as well as person-centered notions of genuineness, empathy, and unconditional positive regard (Rudnick & Roe, 2010). Research has examined SDM for a variety of illnesses and disabilities including treatment decisions related to cancer (Gattellari, Butow, & Tattersall, 2001; van Roosmalen et al., 2004), prostatic hypertrophy (Murray et al., 2001), substance abuse (Joosten et al., 2008), GI disorders (Greenfield, Kaplan, & Ware, 1985) and mental illness (Ludman et al., 2003; Malm, Ivarsson, Allebeck, Falloon, 2003). Meta-analyses and reviews of studies yielded mixed conclusions (Bauer, 2002; Joosten et al., 2009; Nosé, Barbui, & Tansella, 2003). Results showed SDM leads to enhanced satisfaction with and more knowledge about treatments and their providers. Adherence seemed to improve in about one quarter to as many as two thirds, of research participants. But improvement in adherence frequently diminished in the weeks after intervention ceased. Moreover, characteristics of research participants, especially as related to their rational capabilities, seemed to diminish effects.



Motivational interviewing might be viewed as a form of SDM, originally developed as a treatment for substance abuse and extended as an adjunct for services in other illnesses (Martins & McNeil, 2009; Mitcheson, 2009) including psychiatric disability (McCracken & Corrigan, 2008). As such, it is often used as a practical strategy for promoting rational patients. Motivational interviewing presumes stages of change that are defined by the relationship between perceived costs and benefits of a health decision (Prochaska & DiClemente, 1982, 1986). Stages of change theory is significant because it identifies people who are not ready to participate in treatment because they do not believe the clinical condition or disability is dire or in need of response. Using job goals as an example, people in what have been called the contemplation stage might admit to some disadvantages in not working (limited income, decreased social network, missed sense of industry) but believe its actual costs are minimal (this is better than risking a psychotic relapse). Precontemplation is the stage where the person fails to recognize any costs to the condition (returning to work is not really a priority of mine. After all, my roommate does not work.).

Motivational interviewing (MI) is a clinical intervention meant to impact contemplation and precontemplation stages of change. It expands the simple cost-benefit balance sheet into a counseling process resting on four basic principles: express empathy, develop discrepancy, roll with resistance, and support self-efficacy (Miller & Rollnick, 2002). Results of a meta-analysis (DiMatteo et al., 2002) as well as from individual studies of MI and treatment adherence have yielded positive findings for HIV-AIDS (Diiorio et al., 2008), smoking cessation (Thyrian et al., 2007), asthma (Schmaling, Blume, & Afari, 2001), substance abuse (Smith, Hall, Jang, & Arndt, 2009) and, specifically germane to the goals of this paper, the disabilities related to schizophrenia (Drymalski & Campbell, 2009). These studies also showed MI to be limited in its impact on health decision making.

Perhaps one reason SDM and MI effects are limited for people with serious psychiatric disabilities is the impact of cognitive deficits; as a result of information processing dysfunctions, some people are unable to understand the balance of advantages and disadvantages of specific health decisions. People with schizophrenia show deficits in attention, memory, and executive functioning that may undermine adherence decisions (Kim et al., 2006). People in the acute stage of illness often experience psychotic symptoms that may skew decision making and medication adherence (Alvarez-Jimenez et al., 2009). Many people with illnesses in the schizophrenia spectrum show lower intelligence that may be due to the illness itself or its chronic course (Xiang, Shum, Chiu, Tang, & Ungvari, 2010). Regardless, some intellectual deficits have been shown to be associated with poor decision making related to medication management (Willard, 2006). Many people with schizophrenia lack insight into their illness (Buckley et al., 2007). Absence of disease awareness is associated with poor adherence (Beck, Cavelti, Kvrjic, Kleim & Vauth, 2011). Further complicating this picture is the distinct impact of diminished cognitive processing, and its effect on rational decision making, from cognitive disorganization which might diminish follow through on recommendations.

Towards this end, cognitive therapies have been developed and tested to enhance a person's treatment decisions and behaviors. Although some of these therapies have targeted thought contents (e.g., inaccurate beliefs about the harm of a medication) in the Beckian approach to

cognitive behavior therapy -- i.e., challenging irrational thoughts that undermine some health decisions (Wright, Kingdon, Turkington et al., 2008) -- more successful has been cognitive rehabilitation attempting to diminish the processing deficits that undermine comprehension of these decisions. Cognitive adaptation training (CAT) is a good example of the latter with growing supportive evidence (Velligan et al., 2002; Velligan et al., 2008). One way cognitive rehabilitation addresses information processing deficits is by providing tasks that “exercise” key processes such as attention and memory through many repetitions of computer tasks (Wykes & Reeder, 2005). CAT is an example of the alternative, what seems to be a more effective approach to cognitive rehabilitation; namely, the provision of compensatory strategies and environmental supports specifically built around real-world tasks of the individual. In order to help people with cognitive difficulties that result from some psychiatric disabilities, they might work with a rehabilitation counselor to clear out old prescriptions and over-the-counter medications from the bathroom cabinet; set all current prescriptions in an organized, daily pill box; and record a message in the person’s own voice tied to a computer alarm that reminds them, “It’s time to take my medication.”

Despite problems posed by cognitive deficits, we need to make sure misunderstandings and stigma about psychiatric disabilities do not derail the argument of our paper (Corrigan, 2005). Not everyone with serious mental illness is handicapped by cognitive dysfunctions. Those with cognitive dysfunctions are not necessarily unable to make decisions about their treatment and health. Cognitive deficits vary with some periods of remission being common, periods when decision making capacities are fine. Most people with psychiatric disabilities are usually able to participate in MI and SDM. Hence, the rational patient model is relevant for understanding treatment decisions and behaviors in people with psychiatric disabilities. And hence, limitations of those models are equally relevant. Three limitations are summarized earlier in Table 2 and more fully developed here.

**1. Many Decisions About Health are Implicit**—Many treatment decisions are made outside awareness. Individuals may automatically associate medication or other treatment with disadvantages, irrespective of whether they deliberately endorse the proposition that the therapy is good. Social psychological research has convincingly shown that implicit, automatically activated associations can differ from deliberately endorsed propositions (Gawronski & Bodenhausen, 2006; Greenwald & Nosek, 2009). Implicit reactions are typically characterized by rapidity, spontaneity (lack of conscious intention), efficiency (minimal use of attentional resources), inevitability (lack of control over initial activation), and unawareness of triggering cues (Bargh, 1994; Gawronski & Bodenhausen 2006). In this context, implicitness suggests the “concept” of rehabilitation or health behavior can automatically activate positive or negative attributes if these concepts are associated with one another in memory. Well-established reaction-time tasks such as the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz 1998) measure automatic associations between two concepts (e.g., Medication’ and ‘Good’), and thus may index implicit attitudes toward treatments. Because indirect measures of implicit reactions are less susceptible to strategic response distortions and self-presentational strategies, they are particularly helpful in work on health decisions where participants may hesitate to openly endorse negative attitudes to treatments. In addition, implicit versus explicit responses often



independently predict outcome variables. A recent meta-analysis on the IAT concluded that implicit reactions typically predicted behavior beyond that explained by explicit reactions (Greenwald, Poehlman, Uhlmann, & Banaji, 2009).

Consistent with research on the IAT, implicit processes have been likened to simple associations between various products of information processing (frequently memory of attitudes or stereotypes) (Greenwald et al., 2009). For example, implicit positive attitudes about Drug X at moment Y are associated with a subsequent decision to take medication at that moment. Alternatively, implicit processes are described as a wholly functioning executive that occur outside awareness, seemingly transforming information to meet the demands of the situation; Dijksterhuis (Dijksterhuis & Aarts, 2010; Dijksterhuis & Nordgren, 2006) calls this incubation or the “sleep on it” effect. A person, for example, may spontaneously seem to understand costs and benefits of a decision about a health behavior where he or she has been stumped in the past. “Now I see why I should work with a job coach to find employment.”

Although not well-developed for health decisions, some research has found associations between implicit attitudes and health decisions and behaviors including food choice and consumption (Frieze, Hofmann, & Wänke, 2008), adolescents’ impulsive school behavior (Navarick, 2004), condom use (Broaddus, 2009) and marijuana consumption (Scott-Sheldon, 2006). There is also a fairly extensive body of research that has examined implicit reactions related to addictions. Implicit positive reactions to alcohol significantly predicted drinking in adolescents (Thush & Wiers, 2007) and stronger implicit associations of alcohol with positive arousal were related to increased alcohol use (Houben, Rothermund, & Wiers, 2009). Negative implicit attitudes toward smoking were associated with abstinence independent of explicit attitudes (Kahler et al., 2007) and predicted lower levels of craving and tobacco dependence (Waters et al., 2007). Finally, a single study by our group examined explicit versus implicit attitudes to psychiatric medication among 85 people with schizophrenia and similar psychiatric disabilities (Rüsch, Todd, Bodenhausen, Weiden, & Corrigan, 2009). Explicit, but not implicit, positive attitudes to psychiatric medication predicted higher self-reported medication adherence. However, implicit, not explicit, positive attitudes to medication predicted stronger insight into having a mental illness and stronger perceived need for treatment. Of note, implicit and explicit attitudes were not correlated, suggesting that the two represent distinct constructs. This study indicated that implicit attitudes to treatment can be measured and explain variance of treatment-related variables independent of explicit attitudes. Implicit attitudes’ effect on treatment-related cognitions and behaviors need to continue to be examined in future research.

### **Influencing Implicit Processes**

There are practice-oriented clinical approaches (POCAs) that seem to improve largely automated, everyday health behaviors (Sritharan & Gawronski, 2010). An intervention among older adults to impact blood glucose monitoring successfully used detailed implementation plans including imagination techniques in order to enhance adherence during largely automated daily routines of participants (Liu & Park, 2004). Specifically, research participants were instructed to imagine themselves at home completing a

glucometer task in a step-by-step fashion. Participants in this group performed nearly 50% more daily screening tasks than those in comparison conditions. In a laboratory-based setting, Wiers and colleagues (2010) used an evaluative conditioning procedure -- the repeated pairing of alcohol-related and negative stimuli -- to modify implicit attitudes related to alcohol abuse. It is thought that pairing alcohol-related stimuli with words or pictures of negative valence leads to new affective associations with the attitude object. Evaluative conditioning was shown to induce more negative implicit attitudes, less alcohol consumption, and less craving (Houben, Havermans, & Wiers, 2010; Houben, Schoenmakers, & Wiers, 2010). Another study involved approach- and avoidance-reactions with a computer joystick to alcohol-related stimuli; participants learned avoidance- and unlearned approach-behaviors which in turn predicted subsequent alcohol consumption (Wiers, Rinck, Kordts, Houben, & Strack, 2010). Although implicit reactions may be improved by evaluative conditioning, investigators caution that such interventions are only effective when also targeting explicit attitudes (Sritharan & Gawronski 2010). The same is likely to apply to interventions meant to impact health and rehabilitation decisions.

**2. Immediate Processes Influence Health Decisions and Behaviors—**The idea of rational health decision making sometimes suggests health and treatment are discrete phenomena with clear beginning and endpoints. This seems to frame treatment participation solely as an outcome which misguides some researchers into one time end measurements. Pescosolido (1992) redefined finite health decision and beliefs as more continuous experience and dynamics. Viewing treatment decisions and behaviors as one of many experiences on a healthcare trajectory frames the experience in terms of the stream of social life. Assessment of single and relatively “distant” health decisions fails to capture the phenomenon of actually doing treatment and rehabilitation. Experiences are dynamic and influenced by ever changing social forces. These are external and internal mediators that impact relationships between health decisions addressing similar needs at different times. The Theories of Reasoned Action and Planned Behavior further expand on the immediacy of decisions and behaviors (Ajzen, 1988; Ajzen & Fishbein, 1980); the paradigms do not explain behaviors *per se* but behavioral intentions. Behavioral intentions are most likely to reflect actual behavior when the intention occurs relatively soon before the setting and time in which the behavior was meant to happen.

In terms of health behavior, research has shown that recollections of painful/unpleasant medical procedures are strongly influenced by the most recent or “end” characteristics of the procedure (Redelmeier & Kahneman, 1996; Redelmeier, Katz, & Kahneman, 2003). Ironically, people seem to favor longer procedures if they entail less discomfort at the end of the procedure, even if earlier steps produced notable pain intensity (Kahneman, Fredrickson, Schrieber, & Redelmeier, 1993; Redelmeier, Katz, & Kahneman, 2003). The significance of momentary characteristics of a procedure impacting adherence behaviors is often overlooked in existing research which examined predictors of poor adherence: long-term, fixed variables such as cognitive characteristics, gender, age, socioeconomic status, and type of illness (DiMatteo, 2004; DiMatteo, Giordani, Lepper, H& Croghan, 2002). Although the study of stable variables may be useful for determining systemic resource allocation and preemptive/prevention efforts in populations at risk for adherence problems, prescribed

treatments most often require ongoing daily effort which are facilitated or hindered by one's immediate context. Adherence is not an isolated decision with a predetermined aftermath. Rather, adherence is a process that occurs in ever-changing intrapersonal, interpersonal, and physical conditions that may impact one's ability or motivation to engage in, or curtail, daily behaviors.

### **Influencing the Immediate Context**

Correlational or retrospective designs are incapable of capturing the dynamic nature of health decisions and behaviors, or of identifying the role immediate/contextual factors may play. Correlational models, for example, provide "snapshots" of one's adherence and context, but are ill-equipped to examine fluctuating behavior or contextual change. A retrospective view will encompass periods in which dynamic processes likely took place, but rely upon research participants' ability to recall and summarize their experiences accurately, a process shown to produce biased reports when compared to real-time ratings (Ben-Zeev & Young, 2010; Ben-Zeev, Young, & Madsen, 2009; Ebner-Priemer et al., 2006). Experience Sampling Methods (ESM) offer a measurement model that is ideally-suited to capture the ebb-and-flow of adherence behaviors and examine the possible effects of immediate contextual factors (Csikszentmihalyi & Larson, 1987). ESM (also known as ambulatory assessment or ecological momentary assessment) is an intensive, repeated measures strategy that utilizes an electronic device to prompt participants to complete self-report questionnaires about their immediate thoughts, feelings, bodily sensations, activities, and settings, in real-time, multiple times a day. Data collected in ESM studies reflect an individual's immediate or most recent state within the context and flow of daily experience, facilitating the study of microprocesses that influence behavior in real-world contexts (Shiffman, Stone, & Hufford, 2008). With real-time data capture, researchers can map the temporal sequence or co-occurrence of events over a given period of data collection, identifying immediate and/or short-term relationships between variables within individuals (Ebner-Priemer, Eid, Kleindienst, Stabenow, & Trull, 2009). Recent studies using this approach have produced some insights into relationships between immediate contextual factors and health related behaviors including cigarette smoking in individuals attempting to quit (Shiffman & Kirchner, 2009), physical activity in older adults (Dunton, Atienza, Castro, & King, 2009), self-injurious behaviors in adolescents (Nock, Prinstein, & Sterba, 2009), and self-medication of symptoms via substance use in schizophrenia (Swendsen, Ben-Zeev, & Granholm, 2010).

Pioneering research has explored the utility of mobile technologies for Ecological Momentary Interventions (EMI) that provide real-time, real-world support for a variety of health decisions (Depp et al., 2010; Heron & Smyth, 2010). For example, providers might equip people with personal digital assistants which provide repeated, real time reminders of previously agreed upon health decisions. Time, place, and content of reminders are set as an algorithm based on previous ESM findings. One study showed this kind of technology enhanced medication adherence in 42 people with schizophrenia or schizoaffective disorder who completed the task (Granholm et al., in press). EMI can be further enhanced with interactive voice response systems integrated into platforms meant to enhance quality and

diversity of cues (Freedman, Lester, McNamara, Milby, & Schumacher, 2006; Levin & Levin, 2006).

**3. Many Health Decisions are Influenced by Emotions**—Emotions influence health decision making independent of cognition both directly and indirectly which seemingly challenges premises of the rational patient. First, emotions have been likened to motivation with people making specific health decisions in order to obtain or avoid consequences of emotions that accompany those decisions. In this way, motivation activates the decision making task. Second, research has found the interoceptive sequelae of emotions may have direct, not cognitively mediated, effects on adherence. In part, this is an arousal function, a more nonspecific version of psychological activation. Each of these implications is considered more fully in turn.

**Emotions motivate health decisions:** Kahneman (1999) proposed Hedonic Theory to argue that perceived utility of a decision or behavior is influenced by emotional response to the experience which subsequently impacts whether said decision or behavior will be repeated. Consistent with this Theory, research has shown emotions correspond with a range of health decisions with some (negatively valenced) seeming to undermine health decisions while others (more positively charged) enhancing decisions (Magai, Consedine, Neugut, & Hershman, 2007). Hedonic Theory has been used to understand emotion's effects on health conditions and behavior including obesity (Cota, Tschop, Horvath, & Levine, 2006; Mela, 2006), smoking (Blendy et al., 2005; Dawkins, Acaster, & Powell, 2007), substance abuse (Berridge, 2007; Stevens, Peschk, & Schwarz, 2007), and exercise (Williams, 2008).

Research has fairly consistently shown depression undermines adherence to many treatment regimens with one meta-analysis yielding an odds ratio greater than three (DiMatteo, Lepper, & Croghan, 2000). People who are depressed are less likely to adhere to hypertensive (Lannin, Matthews, Mitchell, Swanson, & Edwards, 1998) and HIV (van Servellen, Chang, Garcia, & Lombardi, 2002) medication prescriptions as well as renal dialysis (Brownbridge & Fielding, 1994), mammography or other procedures for breast cancer (Magai, Consedine, Neugut, & Hershman, 2007), and oral hypoglycemic treatments for diabetes (Kalsekar et al., 2006). Research on the effects of anxiety, which would seem to be similarly valenced, is mixed showing the complexity of linking adherence to quality of negative affect. Consider adherence to interventions related to breast cancer (Magai et al. 2007). There is a significant relationship between cancer fear and screening but, interestingly, a significant and inverse relationship between fear related to hospitalization, surgery, or mammography screening (Consedine, Magai, Krivoshekova, Ryzewicz, & Neugut, 2004). People highly "emotional" and concerned about pain are less likely to adhere to pharmacological treatment for chronic pain (Nicklas, Dunbar, & Wild, 2010). A particularly social aspect of anxiety -- embarrassment -- is also related to adherence (Rüsch, Todd, Bodenhausen, Olschewski, & Corrigan, 2010). People will avoid illness screening or other aspects of treatment in order to escape the stigma of that illness (Corrigan, 2004; Garbers, Jessop, Foti, UribeArrea, & Chiasson, 2003).

**Interoception and arousal:** Interoception might be simply defined as sensitivity to stimuli originating within the body, especially relevant to emotion vis-à-vis heart rate, muscle

tension, and skin conductance. It has also broadly been equated to visceral or somatic markers and associated with constructs related to physiological arousal and activation. Significant research has examined the relationship between proxies of interoception and emotional arousal. Studies have shown better heart beat detection translates into greater intensity of self-reported affect (Critchey et al., 2004; Wiens et al., 2000). More relevant to the point here, research examining the relationship between interoception, arousal, and decision making has shown visceral effects of emotion partially influence decision making via its impact on perceived reinforcement and punishment of outcomes of that decision (Damasio, 1994; Naqvi & Bechara, 2009). These kinds of processes specifically influence health-related decision making (Hall, Ekkekakis, & Petruzzello, 2010; Jollant, Lawrence et al., 2010). Important here is the recognition that many of these processes occur outside awareness consistent with the reflexive nature of emotions (Bechara, Damasio, Tranel, & Damasio, 1997). In fact, research has identified a slew of psychological processes relevant to health decision making that are emotionally driven outside of awareness including appraisal of: threat (Adolphs et al., 2005), others' traits (Willis & Todorov, 2006; Winston, Strange, O'Doherty, & Dolan, 2002), and social rewards (Cloutier, Heatherton, Whalen, & Kelley, 2008).

### The Impact of Non-Cognitive Behavior Therapies

One of the goals of many cognitive therapies is to teach people how to manage out of control emotions by reframing the appraisals that correspond with them. In this light, cognitive therapy seeks to help the rational patient. Alternatively, knowledge that emotions are independent psychological processes, often affecting human behavior and experience separate from cognition, has significantly influenced relatively recent and innovative perspectives about change strategies. Two principles have emerged to expand the potential of CBT: acceptance and mindfulness. Acceptance suggests hurtful psychiatric problems and symptoms can be overcome, not by fighting symptoms *per se*, but by recognizing those symptoms and accepting them as an authentic part of the person's condition at that moment (Hayes, Strosahl, & Wilson, 1999). Hence, contrary to many CBT approaches which would suggest negative emotional reactions to health should somehow be controlled, notions of acceptance encourage the person to recognize the positive or negatively valenced affect in response to the health condition or treatment, and use these emotional reactions to better experience the event.

Mindfulness through meditation is a tool that can promote acceptance and has played a central role in the new generation of therapies (Kabat-Zinn, 2001; Linehan, 1993). Mindfulness is an attempt to experience psychological phenomena unfettered by behavior or cognitions. It is the self-regulation of attention focused on the present moment with curiosity and openness (Bishop et al., 2007). Only very recently has research proposed or examined how therapies incorporating acceptance and mindfulness impact adherence. A book chapter promoted dialectical behavior therapy (a prominent intervention incorporating mindfulness) as a method for enhancing adherence to HIV regimens though no research was discussed therein (Singh & Ochitill, 2006). One study, an unpublished dissertation, examined the impact of an acceptance-based intervention on adherence to HIV medication (Moitra, 2009). Results of the randomized controlled trial did not show improvement in self-rated measures

of adherence but did find enhanced immunity markers in the treatment, compared to control, group. Post hoc analyses showed baseline mindful acceptance predicted self-reported adherence.

## Summary and Conclusions

The significant problem of treatment non-adherence was framed here as an important example of a broader collection of health-related decisions and behaviors. The rational patient was reviewed as one popular paradigm for understanding health decisions and behaviors including largely cognitive behavioral methods to impact the deliberative decision maker. These included shared decision making, motivational interviewing, and cognitive rehabilitation strategies that attempt to help the person with cognitive disability better grasp the decision process. We asserted, however, significant limitations to a deliberative perspective; the body of the paper described three. We also proposed ways in which these hypothetical explanations might be impacted to enhance satisfaction with health decisions and behaviors. (1) Instead of health decisions being made deliberately through careful consideration of advantages and disadvantages, significant cognitive processes occur implicitly, potentially outside awareness. These might be simple associations between two constructs: taking medication is bad. Alternatively they may represent totally executive processes outside awareness, Dijksterhuis' (2010) sleep on it effect. Theories and measurement models related to the Implicit Association Test and corresponding, practice-oriented clinical approaches have begun to describe and impact the implicit relationship between health decisions and satisfaction.

(2) The person is planful as well as influenced by the immediate exigencies, factors which often differ from the consideration of days earlier. Health behavior requires ongoing daily effort to realize a health plan. Research relying on experience sampling methods and ecological momentary interventions has helped to describe the immediacy of influences and ways to impact them. (3) A rational patient is not always a cool operator acting on decisions divorced from emotion. Instead research shows decision making often to be a hot process with emotions occurring both explicitly (as inhibitors of motivators for specific decisions) and implicitly (interoceptive and arousing processes that may orient the person to different decisions and behaviors). The evolution of clinical therapies to include mindfulness and acceptance may prove useful for improving satisfaction with health decisions.

## Multi-Process Decision Making Model

Rational patient models are obviously limited such that health decision making needs a broader paradigm to fully understand choices people make about their psychiatric treatments. These need to carefully integrate supra-deliberative factors. Social psychologists in other venues have begun this by posing dual-process models that describe the interaction of explicit and implicit processes in everyday behavior (Chaiken & Trope, 1999). These models propose social decisions and behaviors as influenced by both deliberative processes and those that occur outside awareness. Subsequent research balances measures of implicit cognition with proxies of more rational processes. As these models matured, researchers identified factors that moderate the interaction of explicit and implicit cognitive processing. Fazio (1990; Fazio & Towles-Schwen, 1999; Olson & Fazio, 2008) outlined motivation and



opportunity as determinants of implicit versus explicit effects on decision making. Given the effort that reflection requires in explicit processes, some motivation is required to be deliberative in behaviors, with the motivation *to be accurate* or the cost to judgmental mistakes prominent among these. When there are no perceived costs or benefits to a health behavior like taking medications, for example, there is no motivation to be deliberative or effortful in considerations. Fazio noted that cost to be deliberative is not sufficient for explicit processes. Time and resources to deliberate – opportunity -- must also be available. Situations requiring a rapid response fail to provide the time the person needs to carefully consider multiple contingencies. Hence, the person confronted by unexpected side effects of a medication moments before having to dash out of the apartment for work is more likely to rely on implicit processes.

Dual process models account for only one aspect of supra-deliberative factors so that a multi-process model (MPM) is actually needed to more completely explain health decisions. Additional processes as outlined here are immediate, instead of planful, and emotion-related instead of cold cognition. MPMs yield the exciting conundrum of theoretical paths that need to be tested to show how these various factors combine. Equally important are research programs that seek to test the relative and combined impact of strategies meant to target the various aspects of MPMs. Finally, comprehensive MPMs might lead to identifying whether attempts at fostering specific deliberative or supra-deliberative processes actually undermine health decisions. Does shared decision making, for example, interfere with the kinds of benefits that might occur from my automatic choices (Dijksterhuis & Aarts, 2010)?

MPMs do not limit progress to the processes identified herein. We expect to show additional theoretical constructs relevant to health decision making. For example, the rational patient model may suggest people acting alone in deciding about health options. Social psychology, however, has shown individual decisions only make sense in terms of the larger social network in which the person acts (Ajzen, 1988). Key to social network is typically family, close friends, and perhaps co-workers. Cultural variables are important moderators with, for example, collectivist cultures likely to influence the impact of social networks on individual health decisions differently than more individualist groups (Triandis & Gelfand, 2012). Additionally important to social network is the service provider as well as peers in the service system. The point here is that MPMs of health decision making provide a heuristic to go forward in more completely understanding how a person with psychiatric disability makes decisions about specific intervention options.

An additional goal of MPMs specific to the health decisions of people with psychiatric disabilities is ways in which these disabilities mediate the decision process. We alluded to the role cognitive disabilities have on decision making in some people with psychosis. Research needs to more fully examine how the supra-deliberative factors are impacted by these kinds of disabilities. For example, studies have recently examined the interaction of implicit processes and affective disturbances in people with disabilities in the schizophrenia spectrum (Cohen, Beck, Najolia, & Brown, 2011). Other areas of disability might also be important in advancing MPMs. Consider the impact of social networks of people with psychotic disorders on decision making. As a result, rehabilitation providers will be able to

craft deliberative and supra-deliberative interventions that meet the specific challenges of those with serious mental illness.

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### Impact and Implications

- Beyond the traditional model of shared decision making, the review outlines supra-deliberative processes that effect health actions: implicit cognitions, immediate influences, and emotional effects.
- This paper provides a summary of research and theory that represent supra-deliberative processes especially as related to psychiatric disabilities, and practices that might help people avail these processes when making health decisions. This calls for a multi-process model (MPM) of health decision making which is proposed here.
- These practices extend interventions beyond cognitive behavioral approaches to include strategies that impact implicit, immediate, and emotional processes.

**Table 1**

Rates of failing to adhere to different treatments for various illnesses.

ILLNESS	TREATMENT OR PROCEDURE	FAILURE TO ADHERE	CITATIONS
MENTAL ILLNESS			
Schizophrenia	medications	50–74%	Gilmer et al., 2004; Kessler, et al., 2001; Jones et al, 1999; Lehman et al., 1998; Lieberman et al., 2005; Narrow et al., 1993; Smith, 2006; Stroup & Appelbaum, 2006
Schizophrenia	psychosocial treatments	~50%	Dixon et al., 2010; Lehman et al., 1998
Bipolar disorder	medication or psychosocial treatments	25%	McCarthy et al., 2007
General mental illness	psychosocial treatments	22.4%	Olfson et al., 2009
Co-occurring mental illness and substance abuse	12 step programs	75–85%	Terra et al., 2006
OTHER ILLNESSES OR DISABILITIES			
Cancer	Medication	50%	Partridge et al., 2003
Heart, Lung, & Blood	Medication	12–28%	Fung et al., 2007
Childhood Asthma	Medication Doctors Visits	43% 60%	Celano et al., 2010



**Table 2**

Models of the rational patient contrasted with supra-deliberative processes.

<b>RATIONAL PATIENT</b>	<b>SUPRA-DELIBERATIVE PROCESSES</b>
Health belief model: health decisions specific to individual diseases are influenced by perceptions of susceptibility to the disease, disease severity, barriers to intervention, and treatment benefits.	Implicit decision making: decisions are made outside of awareness, relatively effortlessly, and quickly.
Protection motivation theory: health decisions are effected by the appraised: threats of a condition and resources to do with the threat.	Immediate decision making: rather than planful, the immediate characteristics of a situation often drive a decision.
Self-efficacy: confidence in addressing health conditions is an important moderator in understanding health decisions.	Emotional decision making: affective characteristics of a situation impact its analysis and subsequent decisions.
Theory of Reasoned Action (TRA): in addition to perceived threats and consequences of a health condition, social norms, the perception of important others, are impactful moderators.	
Theory of Planned Behavior: this extends TRA with notions of perceived control.	