The Adult Stages of Social Perspective-taking: Assessment with the Doctor-Patient Problem

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A Thesis Presented to the Faculty
of the Graduate School of Education of Harvard University
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

1992

Dedicated to
Lawrence Kohlberg

Acknowledgements

The Life-span model of Stages of Social Perspective-taking presented is strongly influenced by the work of Lawrence Kohlberg, 1958 to the present. For me, Kohlberg's (e.g. 1958, 1981, 1984, 1987) relentless effort to systematize and refine his model on social-ethical and moral reasoning stands as a great role model for the field of developmental psychology. Kohlberg's social-moral stage arguments underlie much of the substance in the social perspective-taking stages proposed by Selman and in this paper, including notions of adult stages of reasoning (stages 5 to 6 of moral justice reasoning).

I thank Michael L. Commons for helping me apply the structural arguments of the General Stage Model (Commons & Richards, 1984a, b; Commons, Stein, & Richards, submitted). That model helps to exemplify the structural consistency that extend's Selman's stages of Social Perspective-taking. In addition, the diagrams provided to help illustrate the coordination of the stages 2 and 2/3 of perspective-taking were in part designed by Michael L. Commons.

Notions of Stage 6 are provided by Sonnert and Commons (Submitted), who in turn extend Kohlberg's (1984, in press) ideas on justice reasoning, and Habermas's (1982) ideas on the universal ethic of communication and problems of ethical relativity and skepticism.

I also wish to thank Robert Selman, John Willett and David Perkins for their support and encouragement.

This work was completed with a series of grants to me from the Dare Association, Inc.

Abstract

The fields of education and psychology are expressing a growing interest in life-span development. Yet little information exists to determine the role of developmental models in adult education. What should educators consider in designing educational programs for adults (graduate students, doctoral candidates, professional practitioners, etc.)? My particular area of interest is adult stages of social-perspective taking. Here a logical and mathematical scheme is applied to Selman's (1976; 1980) stages of social perspective-taking. That model includes elements from stage models such as the Theory of Interpersonal Understanding, (Selman, 1980), The General Stage Model (Commons & Richards, 1984), Perspective-taking Stages of Moral-Justice Reasoning (Kohlberg, 1984); Skill Theory (Fisher, 1980). Particular emphasis is placed on developing two "postformal," stages, systematic, and metasystematic perspective-taking. From that model a social perspective-taking task, the Doctor-Patient Problem, (Rodriguez, Commons & Hill, 1990) is constructed, and tested. In this thesis, I will argue that there are social situations that place postformal perspective-taking demands on individuals. Using the Doctor-Patient Problem I test that hypothesis on adult, "well educated" subjects.

Two broad research questions are addressed in this dissertation: 1) Given that postformal performance by adults has been evidenced on tasks representing other domains, can the Doctor-Patient Problem detect postformal (Stages 5a, systematic and 5b, metasystematic) social-perspective-taking performance? 2) What do the subject responses to a postformal perspective-taking task indicate about how they perceive varied social perspectives?

A novel application of signal detection (Green & Swets, 1966) techniques for analyzing subject responses is introduced. Signal detection theory is coordinated with choice theory (Luce, 1959; Richards & Commons, 1990) to describe exactly how subject responses are coded and scored. The scoring system presented here attempts to improve upon previous developmental techniques (Inhelder and Piaget, 1972; Colby & Kolhberg, 1987; Fisher, 1980; Rest, 1976). The scoring system is applied to the Doctor-Patient Problem to help disclose the social perspective-taking skills of adult subjects. The present study reveals some of the problems adults have when engaging in complex social perspective-taking situations.

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Chapter 1
Introduction

A part of the educational establishment has embraced cognitive development theory (Inhelder & Piaget, 1958; Piaget, 1970, 1972; Piaget & Inhelder, 1969) as a foundation for educational programs and environments that promote learning. By hierarchically ordering and integrating different forms of reasoning, development theory has empowered educators in many ways. For example, it has provided educators with a basis for estimating individuals' readiness to solve problems of different orders of hierarchical complexity. Developmental models have also helped educators understand how content and context can facilitate or hinder learning and problem solving (Cole & D'Andrade, 1982; Fischer, 1980).

The present work focuses on the adult stages of social perspective taking (Rodriguez, 1989), and coordinates many different ideas that have emerged as a result of Piaget's work. Furthermore, this work introduces a novel approach both in stage measurement and data analysis. Much of this work is new, it offers a new kind of developmental task, and a new analytical assessment. The reader is cautioned to refrain from thinking about this work in traditional analytical ways.

This thesis will: 1) describe a historical overview leading to the present work, including a brief description and comparison of Selman's (1980), Kohlberg's (1984), and Armon's stages of social perspective taking, 2) describe several theoretical paradigms that have influenced developmental research, including Piaget's (1953) Stages of logical reasoning, Skill theory (Fischer, 1980), and the General Stage Model (Commons & Richards, 1984), 3) introduce the Life-Span Stage of Social Perspective Taking (Rodriguez, 1989), 4) discuss how that theory is be applied to perspective taking in medicine (the present study), 5) introduce the research instrument, the Doctor-Patient Problem (Rodriguez, Commons, & Hill 1990), 6) introduce Signal Detection Theory (Swets & Green, 1961), 7) discuss how signal detection theory is employed in the present study, 8) describe the data,
9) outline the data analysis, and 10) present a discussion of the findings.

The Research Questions

Two broad questions guide my exploratory study. 1) Given that postformal performance by adults has been evidenced on tasks representing other domains, can the Doctor-Patient Problem detect postformal (Stages 5a, systematic and 5b, metasystematic) social-perspective-taking performance? 2) What do these subject responses to a postformal perspective-taking task indicate about how they perceive varied social perspectives?

Review of history of the problem

The purpose of this review is integrate research findings leading to the present study. The review includes discussions about different notions of developmental stages, different notions about stage models, and different approaches to testing those models.

Piaget's Notion of Stage

Piaget (1954, 1970) asserted that individuals progress developmentally through a sequence of hierarchically ordered stages of logical reasoning. A genetic epistemologist, Piaget's original stance was that changes in reasoning resulted from physiological changes at different ages from infancy to adolescence. These changes enable individuals to reorganize their understanding of environmental events. With each change in stage came a higher order of cognitive skills. Piaget further asserted that the stages are invariant. That is, once a new stage is attained the individual does not lose the ability to reason at that stage. Piaget's later research into this matter (Piaget, 1971) led him to reformulate his stance. He came to recognize the importance of environmental experience in the individual's attainment of a given stage. He concluded there is an unalterable structure to each of the stages. However, progress through the sequence of stages is both facilitated and interrupted by the environment.

Piaget (1965) set forth the following conditions to structure the stages and generate an ordinal sequence. He felt that good stage models have four properties: 1) they postulate discrete stages, 2) the stages connect logically to one another, 3) the rules are consistent from stage to stage, and 4) stage determination is not arbitrary, stages contain logical and mathematically sound elements. Piaget presented a set of criteria that he considered necessary to establish the structural foundation of a stage model. Kohlberg and Armon (1984) describe Piaget's four criteria, presented here in Table 1.
These criteria are a directive to enable stage developmentalists to construct logically sound models, and prevent the creation of arbitrary stage notions. For instance, by prescribing that each stage builds, in a logical and mathematical manner, upon the actions of the previous stage, the criteria guard against gaps in the sequence. They ensure continuity from one stage to another and prevent arbitrary insertions of non-stage steps. Thus, a hierarchical sequence is achieved.

Piaget (1970) showed that individuals progressed along a developmental sequence of hierarchically ordered stages, each divided into two substages: A (beginning) and B (late). His model (Inhelder & Piaget, 1958) comprised of four developmental stages and eight substages: sensory motor operations (A, B), primary operations (IA, IB), concrete operations (IIA, IIB), and

formal operations (IIIA, IIIB). Piaget offered subject performance on logical tasks as empirical evidence of his proposed stages. His tasks assessed logical and mathematical thinking. He argued that once individuals perform a given stage criterion in one domain, such as logic, they can transfer that level of performance to other domains. His only stipulation was that individuals need time to become familiar with the content of the new domain, and the context in which it is presented. Individuals' highest stage performance in any specific domain, he said, exhibits their highest stage potential.

This last assertion by Piaget has been challenged (Fowler, 1980; Fischer, 1980; Kohlberg, 1984). These researchers found that subject performance on developmental tasks varies from domain to domain. However, they have different interpretations of these differences in performance across domains. For instance, Fischer (1980) argues that performance decalage is the rule and not the exception as Piaget had inferred. Kohlberg suggests a spearhead metaphor, where everyone has some domain in which they excel and this skill slowly pulls along their performance in other domains.

Along with this challenge came other challenges to Piaget's theory. One of particular interest to us here is whether development continues beyond adolescence. Kohlberg's (1969) work was the first to shed light on this matter as we will see in the next section.

Kohlberg's Stages of Moral Reasoning

Drawing from Piagetian theory, including the four criteria (Table 1), Kohlberg (1969; 1984) developed a theory of moral stages. Kohlberg weakened the meaning of criterion 3 somewhat (see Table 1). He posited that the structured-whole criterion applied within a domain only, such as the domain of moral reasoning. It did not necessarily apply across domains. He stated that performance on Piagetian cognitive tasks had to precede performance on his moral dilemmas (Kohlberg, 1984). Piaget (1972), himself abandoned the universal form of criterion 3. Kohlberg spoke of *hard* and *soft* stages. *Hard* referred to structural actions necessary to all stage models, and *soft* referred to actions unique to a specific domain. Kohlberg's (Kohlberg & Armon, 1984) last position was that hard stages met all four criteria with criterion 3 limited to domains.

In order to strengthen his model, Kohlberg found it necessary to draw upon Selman's (1980) work on interpersonal behavior. Both Kohlberg (1984) and Selman (1980) drew upon each other's models to support their social-perspective-taking notions. They also asserted that their stage models adhere to Piagetian criteria. In contrast to Piaget's problems requiring logical reasoning exclusively, Kohlberg and Selman used vignettes that presented moral and perspective-taking dilemmas respectively. All three authors agree that logic underlies their respective models. Byrne (1973) found a direct association between performance on Piaget's logical tasks, Selman's perspective-taking tasks and Kohlberg's moral reasoning tasks. Table 2 shows how Kohlberg's stages line up with Piaget's, Selman's and others' stage models. Table 2 suggests how some stage models, that employ Piagetian structural criteria in their stage sequencing, correspond. Due to differences in research focus and arbitrary numbering schemes the stage numbers of these models do not correspond. However, the logical complexity underlying the stages do correspond, as Table 2 shows. For example, Kohlberg's moral reasoning stage 3/4 parallels Piaget's Stage IIIb, formal operations. This means the same hierarchical complex logic is found in both models. Note that

Table 1.

Piaget's (1960) four criteria that specify stage requirements

1. The notion of stage implies a distinction or qualitative difference in modes of thinking that still serve the same basic function (for example, intelligence) at various points in development.
2. These different structures form an invariant sequence, order, or succession in individual development. While cultural factors may accelerate, retard, or arrest development, they do not change the sequence.
3. Each of these different and sequential modes of thought forms a structural whole. A given stage response on a task does not merely represent a specific response determined by knowledge and familiarity with that task or tasks similar to it; rather, it represents an underlying thought-organization. The implication is that various aspects of stage structures should appear as consistent clusters of responses at different times in cognitive development.
4. Stages are hierarchical integrations.

Piaget does not posit postformal stages. Kohlberg (1990) placed moral Stage 4 reasoning at the *consolidated basic formal stage*, which he said corresponds to the first postformal stage. All of Kohlberg's post-conventional stages are postformal (Kohlberg, 1990).

Table 2.

Relationships Among Stage Models[1]

General Model	Piaget	Kohlberg	Selman[3]	Fischer[2] Modified	Approx imate age in years
		Kegan Armon Byrnes			
Childhood					
1a			0	T1	1	
1b					2	1-2
2a	IA	1	1		3	2-4
2b preoperations	IB	1/2		T2	4	4-6
3a primary operations	IIA	2	2		5	6-8
3b concrete operations	IIB	2/3			6	8-10
4a abstract operations	IIIA	3	3	T3	7	10-12
4b formal operations	IIIB	3/4			8	12-17+
Adulthood, Postformal[4]						
5a systematic operations		4,4/5	4		9	18-20+
5b metasystematic		5		T4	10	20+
6a paradigmatic		5/6			11	?
6b cross-paradigmatic		6			12	?

[1] Table 2 is based upon Sonnert and Commons's (submitted) table from Definition of Stage 6 paper, used here with permission. The author has modified the table. The tentative correspondences listed in this table suggest that Kohlberg's (1990) stage 3/4 corresponds to Piaget's stage IIIb, Fischer's level 8 (Fischer, Hand, & Russell, 1984; Fischer, Kenny, 1986), and Commons and Richards' stage 4b (Commons, Richards, & Armon, 1984). Perspective taking level 3/4 was also proposed by Armon (1984b). Kohlberg (1990) placed moral stage 4 reasoning at the consolidated basic formal stage, which he said corresponded to the first postformal stage (Commons & Richard's stage 5a, Fischer's level 9). All of Kohlberg's post-conventional stages are postformal (Kohlberg, 1990; cited in Commons & Grotzer, 1990).

[2] Fischer does not posit any levels beyond 10, which would indicate a 4th tier (personal communication, March 28, 1988). Fischer (1987) has indicated a different correspondence with Kohlberg's stages, with level 8 corresponding to Kohlberg's stage 4.5. Kohlberg (e.g. Colby & Kohlberg, 1987, in preparation; Kohlberg, 1984, 1987) repeatedly reproduced a table from Colby and Kohlberg's unpublished 1975 paper. After the appearance of cognitive developmental stage beyond formal operations, Kohlberg (1990) modified this correspondence a number of times (Commons, Richards & Armon, 1984, Final Table; Kohlberg, 1990; Schrader, 1987). Although he (personal communication, June 20, 1985) revised his section of the final table for Commons, Richards, and Armon (1984) and what he said and wrote (Kohlberg, 1990) he never had a chance to change his own table. For a discussion of this issue see Commons and Grotzer (in press); Walker, (1986).

[3] Kohlberg's stage numbers are used. Selman's levels start at zero (0), Kohlberg does not have a stage 0. Selman does not have stages 5 & 6, but their stages are parallel from 1 to 4.

[4] Vyck (1981) reported that Piaget thought there were postformal stages.

Resemblance Between Kohlberg's and Selman's Models

Kohlberg's and Selman's models have a different number of stages. Selman has five stages (0 to 4), whereas Kohlberg has six (1 to 6), with intermediate stage increments (1/2, 2/3, etc.). However, the perspective-taking descriptions of stages 1 through 4, represent the same sequence of operations in both models.

Here are some brief examples where both authors give similar descriptions of their perspective-taking stages. At Stage 1, the

individual reflects on physical actions (Primary Operations). The child simply acknowledges the actions of others. At Stage 2, specific individuals (oneself and specific others) are central to perspective-taking. Each individual has a point of view (relativistic), each with different specific interests (Concrete Operations). Stage 3, is marked by "stepping outside of one's self" and reflecting on the different points of view in a social interaction (Abstract Operations). At Stage 4, individuals organize a social systemic perspective. This perspective views persons in light of their place in that system (Systematic Operations).

At each stage, the individual's perspective becomes more inclusive, a person's awareness becomes more global. Reflection on social situations becomes more complex. Both authors' stage sequences move from self (Stage 1), to self *or* others (Stage 2), to self *and* others (Stage 3), to self *with respect to* others (Stage 4). In both models, the actions of a given stage organize the actions of the previous stage. Selman does not develop his model beyond the *societal symbolic* stage that parallels Kohlberg's conventional Stage 4. Kohlberg felt that Selman's higher stages did not adequately support the higher stages of moral reasoning. Therefore, Kohlberg built upon Selman's model, adding two postconventional stages of perspective-taking. These stages supported his postconventional stages of moral reason.

Kohlberg (1969) was the first to posit adult stages of reasoning (postconventional stages 5 & 6), and introduce his findings to the developmental and educational fields. However, at the time (in the 1960s), there were no corresponding postformal logical descriptions on which to base moral reasoning. Instead, Kohlberg based his notions of stages 5 and 6 on psychological and philosophical principles. Although this basis was well thought out it did not specifically show that the actions of stage 5 and 6 were built on preceding stage actions. Therefore, it was uncertain whether stages 5 and 6 met Piagetian hierarchical criteria, and that they were not arbitrarily defined.

The notion of higher stages

Kohlberg's (1984) work inspired some Post-Piagetians to address the existence of postformal stages. Research on higher stages of reasoning began with Kohlberg's stage 4 and postconventional stages (1969) and Perry's (1968) work on college students. The research that followed in the 1970's (Arlin, 1975; Loevinger, 1976; Riegel, 1973a, b) proved somewhat problematic because these authors did not meet the four criteria described in Table 1. The period from 1978 to 1982, saw the onset of several postformal stage-sequence proposals (Commons & Richards, 1978; Commons, Richards & Kuhn, 1982; Sinnott, 1981; Sternberg & Downing, 1982). These authors' incentive was to describe the hierarchical complex logic underlying such stages. Each model had its own roots. Commons and Richards 1978 proposal as discussed and quoted in Stevens-Long (1979) and Commons, Richards and Armon (1984a) along with the authors of each of the older (1960s) and newer (1970s) models (Fischer, Hand & Russell, 1984; Pascual-Leone, 1984), set forth the relationships among postformal stages. The diversity of higher stage notions and domains from which they derive have enriched and refined higher stage theory. Today, Kohlberg's postconventional stages remain one of the central anchors of much research in postformal development.

Armon's, Stages of The Good Life

Armon (1984a, 1984b), adhering closely to existing notions of developmental stages, including Kohlberg's notions of Stages 5 and 6, constructed a developmental model of The Good Life. Taking Kohlberg's lead, Armon coupled psychology with philosophy to form a philosophically supported psychological theory. The Good Life Model, as the Moral Stage Model relies heavily on perspective-taking skills. As with Kohlberg, Armon also found it necessary to extend Selman's (1980) stages, to support her notions of the higher stages of the good life.

Armon found Selman's lower stage notions structurally sound, and hoped to describe higher stages (5 & 6) using similar contingencies to those Selman used at the lower stages. Armon's (1984) notions about postformal stages were adapted from the General Stage Model (Commons & Richards, 1978). Table 3 contains Armon's perspective-taking stage descriptions.

Armon's descriptions in of stages 5 and 6 carry Selman's Stage 4 descriptions to more hierarchically complex outcomes. Although Armon's and Kohlberg's higher stage notions appear sound, neither of them delineates the hierarchical elements underlying their stage descriptions. They do not show how each stage builds mathematically and logically upon lower stage actions, as Piaget proposed. Such a description is necessary in order to show that all the stages follow the same criterion, and that the higher stage descriptions are not arbitrary notions.

Byrne's Stages of Role-Taking

The last model relevant to the subject at hand is Byrne's (1973) Role Taking Theory. Byrne's work suggested a link between logical reasoning, perspective taking, and moral reasoning. To support her hypothesis, Byrne proposed two "role-taking stages" that roughly paralleled stages 4 and 5 in the moral domain. As in the case of other early higher stage models, Byrne's proposed stages relied heavily on the philosophical descriptions, and a logical-mathematical scheme underlying stages was not proposed. Nevertheless, her investigations indicated that there is a connection between performance on logical reasoning tasks, perspective-taking tasks, and moral reasoning tasks.

All of the models discussed here have proven their worth in developmental research. Although the models have different focuses they generally support each other. The present work draws from all these sources. In doing so the perspective-taking stages proposed in this thesis are insured of universality.

The Doctor-Patient Relationship and Social-Perspective-Taking

This section briefly discusses the history of problems that the medical field has involving the doctor patient relationship. The Program in Psychiatry and the Law, at the Harvard Medical School, Department of Psychiatry, presently recognizes the doctor-patient relationship as one area that places complex demands on the individuals involved. Of particular concern to The Program is finding ways to train doctors to form a cohesive and informed alliance with their patients. I am working with this group to examine the problem.

Since the 1960s, the field of medicine has taken an interest in informed consent. The Program in Psychiatry and The Law, is one organization showing interest. Informed-consent consists of two sets of actions, 1) being informed, and 2) consenting. A patient is informed when doctor clearly tells the patient of treatment options and their side effects, and verifies the patient's understanding of the information. Patients may be merely "told" if the patient's understanding is not verified. Patients must also have an opportunity to consent, rather than simply assent to the doctor's wishes. Patients may merely assent to the doctor's wishes if they are ignorant, misunderstand, or are unaware of their right to choose between treatment options.

Interest in social-perspective-taking has grown out of the informed-consent issue. These concerns arise out of the interactions claimed, or exposed, in cases involving malpractice suits. The amount of pain and suffering on both sides is extreme. Patients who sue typically report that the compensation does not make them feel any better. Doctors who successfully defend their suits do not feel vindicated. This evidence suggests that doctors and patients often have very different perspectives about what takes place in doctor-patient encounters. In the end, most court decisions result in an attempt to determine whether the doctor has violated the patient's right to make informed treatment choices.

Doctors may inadvertently deny patients the right to make informed treatment choices when they fail to coordinate their perspectives with the patients' perspective. When this occurs, doctors fail to properly inform their patients about treatment options, and they eliminate the patient's role in the decision process. Patients, on the other hand, do not always understand treatments, nor realize that they have the right to choose among treatment options.

Table 3.

Social Perspective-Taking Stages

STAGE 0: Undifferentiated and Egocentric. Self and other are clearly differentiated only as physical, not psychological, entities. The child does not relate two points of view. There is a confusion between the subjective (psychological) and the objective (physical) aspects of the world. Actions are often considered only in terms of their physical, rather than psychological, consequences.

STAGE 1: Differentiated. The child (or adult) clearly differentiates physical and psychological characteristics of persons. The subjective perspectives of self and other are clearly differentiated and recognized as potentially different. Relating of perspectives is conceived of in one-way unilateral terms, in terms of the perspective of, and impact on, one actor.

STAGE 2: Self-reflective/reciprocal. The child or adult can mentally step outside herself and take a self-reflective or second-person perspective on her own thoughts and feelings, and she recognizes that others can do the same. Differences among perspectives are viewed relativistically. This two-way reciprocity, however, is concrete. Each individual views herself and the other in relative isolation, without awareness of the relational system between them.

STAGE 3: Third-Person/mutuality. The individual cannot only step outside her own immediate perspective, but also outside the self as a totality, or system ("observing ego"). The third-person perspective simultaneously includes and coordinates the perspectives of self and other(s). Thus, the situation or system , which includes the self, is viewed from a "generalized other" perspective. This "system," however, is made up of those persons and experiences with which the individual has direct, face-to-face relations. It does not include a system such as "society."

STAGE 4: Multiple Systems. The individual can apply the "generalized other" perspective to distinct, multiple abstract systems such as the societal perspective, the moral perspective, or Nature's perspective, which are differentiated from the interpersonal system perspective of Stage 3. Although there is recognition of multiple, separate systems, the individual is as yet unable to coordinate them. There is an absence of attempts to reconcile potential conflicting relations between systems. That is, the individual can take the perspective of each of the systems independently, but not take multiple system perspectives simultaneously.

I suggest that major causes of malpractice litigation lie in the nonmedical area of doctor-patient interaction. I hypothesize that doctor-patient perspective-taking dilemmas are not being resolved in current medical practice. My study will examine, in this particular setting, how *adults* coordinate multiple perspectives so that an informed agreement can be reached.

To frame the research questions to be addressed in this thesis, both analytic arguments as well as empirical data on adult stages of social perspective-taking are set forth to support such stages:

a. Chapter 2 presents an analytical-theoretical basis for the existence of higher stages of social perspective-taking. I first point out the order of hierarchical complexity of each Social-perspective-taking Stage by showing what lower-stage actions it coordinates. Second, I show which integrations cannot be performed at that stage. These integrations are the characteristics of the next higher Social-perspective-taking Stage.

b. Chapter 3 offers an overview of how the social perspective-taking model is used in the present research design. Chapter 3 introduces the measure (Doctor-Patient Problem), and a psychophysical approach to assessment of subject performance. This novel application of signal detection (Green & Swets, 1966) techniques to stage measurement allows for analyzing single-subject responses. The data, presented in Chapter 4, allow for a comparison between two broad methods of assessment--the psychophysical analysis of subjects' rating data and a qualitative analysis of explanations of such ratings. I hypothesize the outcome according to the theory.
   c. Together these methods help to answer both research question: 1) the psychophysical analysis shows that the Doctor-Patient Problem can the detect postformal (Stages 5a, systematic and 5b, metasystematic) social-perspective-taking performance, and 2) the qualitative analysis reveals some of the difficulties adult subjects have with a postformal perspective-taking task.

Chapter 2
The higher stages of social perspective-taking

In this chapter, the analytic basis for higher stages of perspective-taking are now set forth. Piaget's (1970; Piaget & Inhelder, 1969) criteria, and Commons & Richards's (1984) general stage criteria are applied to Selman's (1980) stages in order to generate the new stage sequence. Kohlberg's (1984), and Armon's (1984) notions of higher stage are adapted to help describe behavior at given stages. Before the perspective-taking stages are described, we will briefly review some aspects of the General Stage Model (Commons & Richard, 1984a, b) that are relevant to the present work.

General Stage Model

To counter the possible objection of arbitrariness in the definition of social-perspective-taking stages, I will ground them in the stage criteria of the General Stage Model (GSM). The General Stage Model describes the Stage criteria necessary to generate a sequence of non-arbitrary stages. The GSM focusses on the analytic properties that stages should have if they exist. It does not claim to describe empirically an existing phenomenon. The following description of the GSM is adapted from Sonnert and Commons (submitted).

Commons and Richards (1984a, b) suggested that developmental theory addresses two conceptually different issues: 1) the hierarchical complexity of the task to be solved; and 2) the psychology, sociology and anthropology of how such task performance develops. They used the hierarchical complexity of tasks as the basis for construing the notion of stage in the General Stage Model. Using abstract modern algebra, they grounded the hierarchical complexity of tasks in mathematical models (Coombs, Dawes, & Tversky, 1970) and information science (Lindsay & Norman, 1977). A set of axioms were set forth that when satisfied defines a stage sequence and describes the necessary analytical properties of stages. The General Stage Model does not posit detailed empirical forms of stages nor the empirical processes that cause stage change.

In the GSM, the successful completion of a task requires an action of a given hierarchical order of complexity. A logical analysis of those tasks shows their order of hierarchical complexity (Commons & Grotzer, 1990; Commons & Richards, 1984a, b; Commons & Rodriguez, 1990):

Actions, including reasoning, at a given order of hierarchical complexity, are defined in terms of the actions at the next lower order of hierarchical complexity. Actions at a higher order of hierarchical complexity usually transform and organize lower-order actions. We say the higher-order action coordinates the actions of the next lower order. This organization of lower-order actions is new and unique and cannot be accomplished by those lower-order actions alone.

For example, multiplying 3 by (9 + 2) requires a distributive action at the concrete order of hierarchical complexity. The distributive action is as follows: 3 x (9 + 2) = (3 x 9) + (3 x 2) = 27 + 6 = 33. That action coordinates (organizes) adding and multiplying by uniquely organizing the order of those actions. The distributive action is therefore one order more complex than the acts of adding and multiplying alone. Although someone who simply adds can arrive at the same answer, being able to do both addition and multiplication in a coordinated manner indicates a greater freedom of thought and action. Through such task analysis, the hierarchical complexity of a task may be determined.[1]

In the General Stage Model, the four Hard Stage Conditions (see Table 1) of Kohlberg and Armon (1984) are met and surpassed (Commons & Trudeau 1991). Condition 1, "qualitative differences in stages" is shown in a GSM theorem. Condition 2, "invariant sequence," is shown by a theorem that follows from the definitions. As an axiom on tasks, condition 3, "structure-of-the-whole," is true everywhere, in every domain and content. Condition 4, "stages are hierarchical integrations" is fulfilled by definition. A fifth condition is added, that the logic of each stage has to be explicit so that the sequence of stages can be tested analytically and new tasks can be classified systematically. This condition is also met by the General Stage Model, which thus becomes an even "harder" stage model than required by the original four Hard Stage Conditions.

The following paragraph gives a capsule description of the analytic properties of the stages in the General Stage Model in descending order. When social-perspective-taking stages are viewed from a General Stage Model perspective, it is useful to translate the social-perspective-taking-stage numbers into the General Stage Model stage numbers. The numbers corresponding to the GSM and older models are included in the description below.[2]

Stage 6b (*Cross-paradigmatic*, Social-perspective-taking Stage 7) in the General Stage Model requires actions that coordinate and integrate fields. A Stage 6a (*Paradigmatic*, Social-perspective-taking Stage 6) field consists of coordinated sets of Stage 5b (*Metasystematic*, Social-perspective-taking Stage 5) metasystems. A Stage 5b metasystem (or "supersystem") coordinates the Stage 5a (*Systematic*, Social-perspective-taking Stage 4) systems. A Stage 5a system is a coordination of Stage 4b (*Formal*, Social-perspective-taking Stage 3/4) relationships--formal operations mark the top stage of Piaget's (Inhelder & Piaget, 1958) system of stages as he designated them. A Stage 4b formal operational relation coordinates variables from Stage 4a (*Abstract*, Social-perspective-taking Stage 3). Such a Stage 4a variable, in turn, is constructed out of Stage 3b (*Concrete*, Social-perspective-taking Stage 2/3) instances of operations acting upon objects by substituting "equals for equals"--an operation that coordinates two sets of operations from the concrete stage.

The compatibility of the General Stage Model with, and usefulness for, more empirical theories of development have been

demonstrated. For example, Commons and Grotzer (1990) recently showed that Kohlberg's stages of social-perspective-taking development can be adequately accounted for by the General Stage Model. Armon (1984a) has used both Kohlberg's moral developmental theory and the General Stage Model to create a general theory of the development of ethical reasoning. Sonnert (in preparation) considers the empirical ramifications of Social-perspective-taking Stage 6. Commons and his collaborators are currently examining possible Social-perspective-taking Stage 6 social perspective-taking in actual institutions. The general method of applying the General Stage Model to the social-perspective-taking domain is the same for every stage.

Constructing the higher stages of social prospective-taking

As stage increases, individuals' universe of discourse increases as well as their ability to see more complex interactions. Individuals see that there are more possible outcomes than they thought there were at a lower stage. In addition, they see more interactions involved in the situation than they saw at a lower stage. The individual sees new relationships that reorder existing outcomes, as premises that further lead to new behavior. These relationships may be expressed mathematically. However, to assist the reader the stages of social perspective-taking will also be illustrated diagrammatically. These diagrams depict stimulus, behavior, and outcome sequences (S-->B...O) for each person in a social situation.

Although the initial intention of this work was to extend Selman's model at the higher end maintaining an algebraically logical, and consistent sequence of stages necessitated the insertion of intermediate stages throughout Selman's proposed stage sequence. The new sequence has more increments than Selman's. Note, that the new increments are full stages not half stages. To facilitate comparing the new stage sequence with Selman's and other models, Selman's original stage numbers are subdivided into an *a* stage and *b* stage. For example, there is now a Stage 2a and a Stage 2b, etc. Selman's original stage numbers are parenthesized whenever the new stages are addressed (i.e. Stage 3a (2)). For a brief description of the higher stages of social perspective-taking see Appendix A.

Because the interest here is on the higher stages, stages lower than 3a will not be described. Stage 3a (2, concrete perspective-taking) is the ideal place to start because it marks the first stage when the individual begins to reflect on a second perspective. These are the stages most relevant to the present study.

Stage 3a (2), concrete perspective-taking

At Stage 3a, the individual begins to reflect on an introspective self (first-person perspective) and second-person perspective (Selman, 1980). Thought processes include the monitoring of one's own plans, feelings, and reactions. Individuals take on a second-person social perspective by reflecting on the relative importance of outer appearances. In this way an individual anticipates the likelihood of another's behavior in obtaining an outcome. Selman calls this a two-way isolated reciprocity. The individual reflects only on the self *or* on the other. There is no reflection on causal outcomes to others that may result from one's own behavior. Diagram 1 shows two plans

of action, the self's plan and the other's plan. While planning, one assesses the effect (*O*) of one's own behavior (*B*) in a situation (*S*). Planning is an action that consists of reflecting upon a situation and the relationship of the actions described in the plan to various outcomes. Reflecting on the plausibility or likelihood of each of the separate particular causal sequences results from a primary operational rule. The rule states the relation between the situation (S), the action (B) and the plausibility of the outcome (...O). If (S--->B) then O. Consequently, at Stage 3a, one only reflects on one's own, internal and external action, and does not coordinate the outcome of one's own actions with the outcome of the actions of others. Therefore, in Diagram 1, there is no connection between self and other. Each plan is "isolated" from the other.

Diagram 1

STAGE 2 PERSPECTIVE-TAKING

S_{Self}----> B_{Self}... O_{Self}

S = First particular situation

B = First particular behavior

O = First particular outcome

Self = One's own self

S_{Other}---> B_{Other}... O_{Self}

S = Another particular situation

B = Another particular behavior

For example, consider two young chess opponents, Lisa and Eric. Lisa sees a way to capture one of Eric's pawns, situation (S) in diagram 1. Lisa plans a move to capture Eric's pawn, behavior (B). Capturing the pawn is the desired outcome (O). At Stage 3a (*primary perspective-taking*), Lisa reflects only on her own scheme of action thus, S_1-->B_1...O_1. Lisa is aware that Eric has a different plan (S_2-->B_2...O_2), but she cannot coordinate it with her own. Actually, Lisa does not know exactly what Eric's plan is, only that it is similar to hers in objective, capturing the opponent's playing pieces. Lisa can only reflect on one sequence of action at the time, in this case her own.

A Stage 3a perspective has simple rules relating a single operation to its outcome. The representation of a specific behavior is coordinated with the representation of a specific situation, the first coordination. The second coordination correlates the behavior with an outcome. One person presumes the same process to be taking place for the "other." The double coordinating is the earmark of beginning concrete operations.

Stage 3b (2/3), Pre-abstract perspective-taking

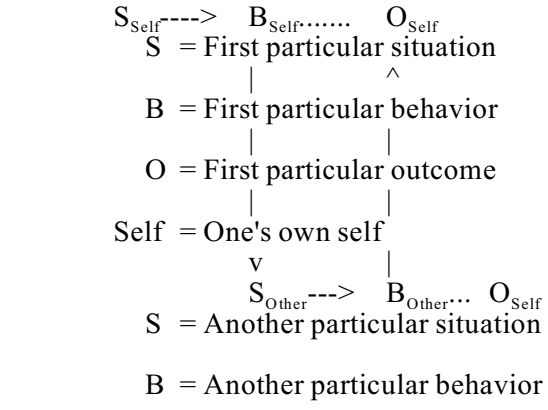
Although Selman (1980) does not posit a Stage 2/3, a qualitatively unique operation takes place between his Stages 2 and 3. In that scheme, at Stage 2 one is aware of differences between self and others, there is no reflection about what events cause the other's behavior. At Stage 3b (2/3), one does coordinate the actions between self and other, however.

Axiom 8 of the General Stage Theory (Commons & Richards, 1984; Commons, Stein & Richards, in preparation) states that for a task-required action, n + 1, to be higher in the chain of operations than another action, n, that first action must be embodied in action n + 1. Action n is reflecting on the self chain, shown in Diagram 1. Action n + 1 is reflecting on an actual concrete other, not an abstract other. This action organizes the two perceptions and the corresponding rules, each describing a causal sequence from the previous stage (see Diagram 2). The first sequence is the cause and effect of one's own specific behavior and the second sequence is the cause and effect of another particular person's specific behavior. Two concrete actions coordinate the two sequences. The first concrete act yields the perception that one's own behavior may cause another's behavior. The other person's behavior is the outcome of one's own behavior. The second concrete act is the recognition that, similarly, the other person's behavior may then effect one's own behavior. This coordination yields the Stage 3b causal prediction about how a specific other person will act when the self acts. This is concrete perspective-taking.

At Stage 3b, one reflects on one's own action when making a prediction about how an outcome may be caused by a behavior. One also attempts to make the same judgement as if one is standing in the other person's shoes. This attempt succeeds only to the degree that one can reflect on how the other person's *behavior* effects one's self. Since one is not truly able to consider the other's intentions, one reflects only on how both the self and other's behavior effects the self. One's own behavior causes the other to behave, the other's behavior then produces the outcome to the self (see Diagram 2). One operates upon the outcome of both of those predictions, yielding a prediction as to what the outcome will likely be from acting in a given manner. Two ordered actions organize the cause and effect of behavior, as shown in Diagram 2. Diagram 2 shows the coordination of the two Stage 3a causal sequences (the primary stage analysis).

Diagram 2

STAGE 3a (2/3), CONCRETE PERSPECTIVE-TAKING



The vertical links are the concrete coordinations of the primary causality. Two concrete-operational actions coordinate the two sequences. The first concrete act yields the perception that one's own behavior may cause of another's behavior as indicated by the downward pointing arrow in Diagram 2. In the second concrete act, one sees one's own is plan effected by the other's behavior, as shown by the upward pointing arrow. Therefore, one's own behavior (B_{Self}) is the premise (S_{Other}), for the other's behavior (B_{other}). One's own behavior is the situation the other must react to. That reaction by the other yields the outcome to one's own behavior, as the upward arrow indicates in diagram 2. The individual believes the self generates the entire sequence, starting at S_{self}. Two individuals engaging in 3b perspective-taking do so in isolated reciprocity. Each interested only in a self generated outcome.

Note that, not only does the self generate the outcome, the reflection is on specific concrete actions (a specific behavior leading to a specific outcome). The Stage 3b operation coordinates the lower Stage 3a actions, Self (S-->B...O) with Other (S-->B...O). These two steps are not deductive but inductive. These two steps cannot be derived from primary operations, otherwise there would be no stage.

Individuals operating at Stage 3b reflect on the causes of their own behavior. They see reasons or motives for actions. There is no abstract notion about the other. The other's behaviors is a consequence of one's own behavior. They intuit that, by doing specific things, they can make others do certain things. In the chess vignette for example, at Stage 3b, Lisa reflects on Eric's plan and coordinates that with her own plan of action. That operation would require Lisa to plan her move and consider how that will effect Eric's move. The new schematization coordinates two lower stage actions (Lisa's plan effects Eric's plan).

Stage 4a (3), Abstract Perspective-taking

Abstract perspective-taking entails taking the third person perspective. This is achieved by *generalizing* the relation between two causal sequences. The first sequence is the cause and effect of one's own specific behavior, and the second sequence is the cause and effect of another particular persons's specific behavior. The action of generalizing one's own perspective-taking properties to others, is a reorganization of the previous stage actions. Selman (1980) calls this action *stepping outside of the self*.

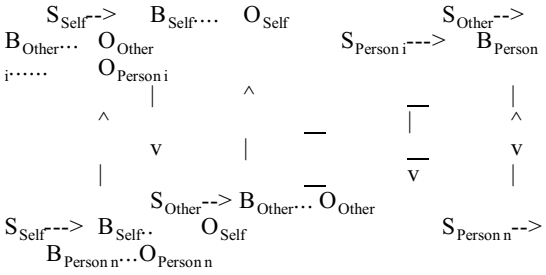
For example, at Stage, 3b, individuals reflect on their own desired outcomes through the specific (concrete) acts of self and other (action n). In action n + 1 (Stage 4a), stepping outside of oneself and becoming a "neutral observer", one induces that any person behaves generally in the same manner as the self does. The Stage 4a operation transforms the specific instances of previous stage actions into prototypical (or stereo typical) behavior. This abstraction replaces specific instances, for example self and other, with abstract labels such a persons. This variabalization or substitution is a coordination of *place holding* (nominalization or universalization of specific persons, things, or actions) with concrete coordination of causality.

"Equals substituting for equals" is an operation that coordinates two sets of operations from the concrete period. The first operation is the coordination of interpersonal cause shown in Diagram 2. The second operation is the equating of specific individuals with the variable *persons* or visa versa. The second operation is inductive in that it either specifies the value of the variable persons, or makes generalizations about persons from two or more specific instances. Diagram 3 helps illustrates how the specific instances of Stage 3b (shown in Diagram 2) become abstracted at Stage 4a.

Abstract operations require one to note that any person$_1$'s behavior affects another person$_2$'s behavior. Individuals see themselves responding to others' behavior in the same way that others responds to their own behavior. Selman (1980) and Kohlberg (1984) call this "stepping outside the self," or "a third person perspective." The previous stage action (I do and other responds) becomes nested in the new operation (person$_1$ does and person$_2$ responds). The individual performing stage 4a perspective-taking coordinates two stage 3b actions (see diagram 2), forming an abstract stage rule (diagram 3). The rule states that individuals carry out similar plans to one another, and affect each other's behavior in much the same way. In forming abstractions each specific instance becomes an element in a *set*. The sets *Person, Situation, Behavior*, and *Outcome* are abstractions. These abstractions are generated by specific elements of stage 3b. For example, Person=(self, other,...person$_X$); Situation=(self behavior, other's behavior,...person$_X$'s behavior); Behavior=(action$_1$, action$_2$,...action$_N$), Outcome=(outcome$_1$, outcome$_2$,...outcome$_N$). The "stepping outside of the self" allows the individual to reflect on the interpersonal *episode* s/he is in, as opposed to specific actions in that episode. Formal causal behavior is not well understood at Stage 4a, however. Abstract perspective-taking forms generalizations from specific concrete causal events, unlike formal perspective-taking that can isolate causal links from complex groups of events. In complex situations that include many actions by two or more persons, the individual is unable to isolate and identify how a given action produces certain outcomes. All of the different actions together appear to cause the outcome. In the chess example, Lisa assumes Eric is trying to capture her pieces, who in turn is trying to capture Eric's. Each move appears to reveal the other's plan. But neither understands how each of their moves consequently alters their own behavior as the game progresses. Therefor, Lisa does not see that a specific move she makes now may cause her to lose the game several moves later. She simply understands that she and Eric are both attempting to cause the other to falter with each move.

Diagram 3

STAGE 4a (3), ABSTRACT PERSPECTIVE-TAKING



Self = One's own self Other = A specific other person Person = One's own self, or

Stage 4b (3/4), Formal Perspective-taking

Formal perspective-taking, Stage 4b, requires the individual to identify causal behavior that produces specific outcomes. This is analogous to variable isolation in piagetian tasks. Individuals isolate the cause and effect relationship between events. The causal rule specifies that, in social interactions, specific events result from antecedent events, events occur in sequences. Individuals performing formal perspective-taking try to isolate the causal origin of each outcome. Each event is isolated and linked causally to some other event. For example, in a complex social situation involving a number of persons their individual actions are isolated, reflected upon and causally linked. A given *outcome* is linked to some antecedent *behavior*, a given *behavior* to some antecedent *situation*, and so on. Events are temporally linked to one another, as shown in Diagram 4. In this way the individual attempts to find the specific cause for a person's behavior in a given situation.

In Diagram 4, the stage 4b perspective sees that events at time 2 are a reaction to the events occurring at time 1, and therefore the actions of person$_{time\ 2}$ are in response to the actions of person$_{time\ 1}$'s behavior. Formal perspective-taking detects cause in two instances: first seeing that one person's behavior affects someone else (part B, first isolated sequence), and second that the second person's behavior produces a consequent behavior

Diagram 4
STAGE 4b (3/4), FORMAL PERSPECTIVE-TAKING

This diagram shows how stage 4b perspective taking isolates and links specific causal actions from groups of actions. Part A shows different actions by different persons in a given social situation. Part B shows that subjects isolate specific actions (in **bold**) and determine their effects (arrows linking actions). Part C shows that the isolated causal sequence is temporal: "*if* any $event_{time1}$ occurs *then* a resulting $event_{time2}$" follows. Also that $event_{time2}$ may effect a subsequent outcome, $event_{time3}$.

Part A

$[S\text{-->}B....O]_{Person\ 1}$ = $[S\text{-->}B....O]_{Time\ 1}$

$[S\text{-->}B....O]_{Person\ 2}$ = $[S\text{-->}B....O]_{Time\ 2}$

$[S\text{-->}B....O]_{Person\ 3}$ = $[S\text{-->}B....O]_{Time\ 3}$

Part B

First isolated sequence in **bold**
Second isolated sequence in **bold**

$[S\text{-->}B.....O]_{Person\ 1}$
$[S\text{--->}B.....O]_{Person\ 1}$
| ^
v |
$[S\text{-->}B.....O]_{Person\ 2}$
$[S\text{-->}B....O]_{Person\ 2}$

| ^

v |
$[S\text{--->}B....O]_{Person\ 3}$
$[S\text{-->}B.....O]_{Person\ 3}$

Part C

Time--->

$[S\text{-->}B....S]_{Time\ 1}$
| ^
v |
$[S\text{-->}B....O]_{Time\ 2}$
| ^
v |
$[S\text{-->}B....O]_{Time\ 3}$

(part B, second isolated sequence). Diagram 4 illustrates transitive causal linking between sequential actions. Therefore, in trying to understand the causes of $person_{time\ 3}$'s behavior, $person_{time\ 3}$'s actions would be directly linked to the preceding actions at time 2. Specific events are isolated then linked to other specific events. Each link (vertical arrow) indicates a causal relationship (B_1-->B_2). The subject now can identify a specific precipitating event (behavior) that causes or triggers another person's specific behavior.

In the chess example, Lisa may be the person at time 1, who considers Eric's possible reaction, if she makes a move to capture one of his pawns. If she does not like the options that move affords Eric, then she will isolate an alternate move. Lisa's choice is arbitrary in the sense that she does not have an overall plan, each possibility appears isolated from others. Eric (the person at time 2) then considers Lisa's possible reaction, to a move that threatens to capture Lisa's pawn in return. Each move and its outcome is considered in isolation from other moves and their outcomes. The move that offers the best immediate result is chosen. Thus, formal perspective-taking enables the opponents to reflect on the cause and effect of each of their individual moves. However, at this stage, the individual is not yet able to coordinate systems of moves that chess masters might call an "opening game," or "a middle game," or "end game," etc.

Stage 5a, (4), Systematic Perspective-taking

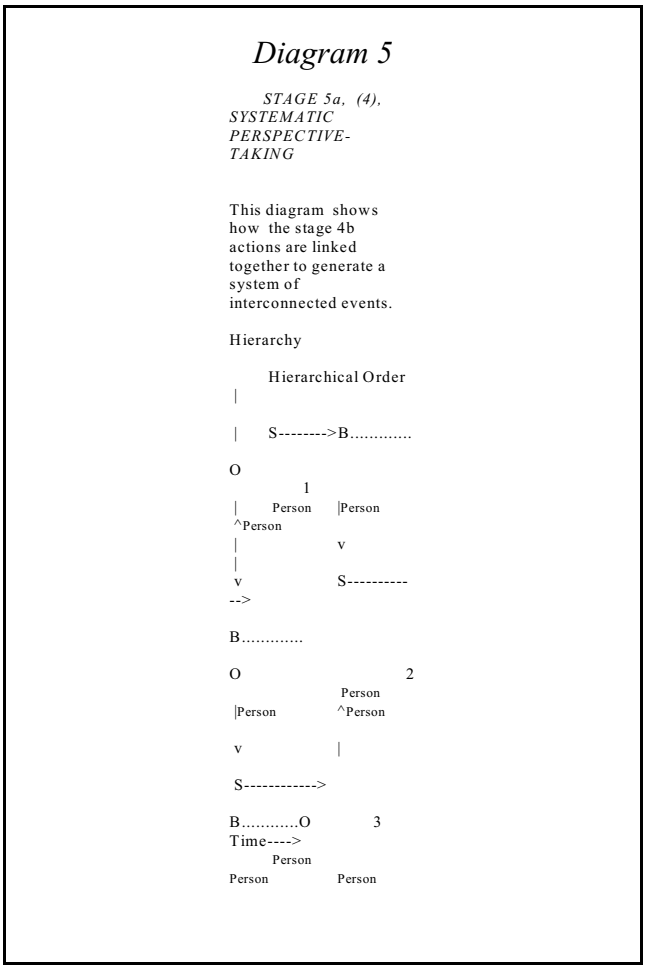
Individuals performing Stage 5a perspective-taking logically organize whole sequences of formal causal actions in a given situation. Through systematic iteration and coordination of the Stage 4b action, the individual identifies complex causal sequences.

Stage 5a rules give order and cohesion to stage 4b actions. Events are causally ordered generating a system of events. The system is not arbitrary. Ordering the events both sequentially and hierarchically helps the individual put events into perspective. Both Kohlberg (1968, 1984) and Selman (1980) have found that subjects performing at Stage 5a (4) reflect on hierarchical ordering of events, behavior, and placement in the social strata. Diagram 5 helps to illustrate the Stage 5a hierarchical organization of social perspective-taking.

The Stage 5a (4) perspective turns the left-to-right temporal ordering of cause and effect from the formal operations stage on its side, as shown in Diagram 5. This creates a corporate-style hierarchy in which causal power flows from the top to the bottom. The system thereby orders the specific events that take place in a given incident. Causal events are now transitively linked to other causal events to form of a system of interactions.

In Diagram 5, events are not simply linear transactions (B_1-->B_2-->B_3...B_n). Rather, behavior B_1 is the premise for behavior B_2, and both B_1 and B_2 together become the premise for the next behavior, B_3: (B_1 -->B_2) -->B_3. Two formal actions are coordinated to produce a resulting third action. This logical schematization orders transitive events hierarchically, thus organizing the system. The systematic perspective-taking rule dictates that a person's behavior is premised on a logical sequence of precedent events. Actions that are causally related at Stage 4b (3/4) are linked to further outcomes. In the event that causes for a person's behavior are not empirically available, individuals performing systematic perspective-taking make guesses about the likelihood of "hidden," "unconscious," events, or "events in one's past" that lead to that behavior (Selman, 1980). Subjects conclude that all social behavior results from complex interactions. A given person's behavior results from a multitude of precedent events. Social events (situations, behaviors, outcomes) are not isolated from one another as was thought in formal perspective-taking. There is also the revelation that specific events may trigger but not necessarily be uniquely responsible for a given outcome. Rather, peoples' responses to a given situation may be chained to many other situations and events. Hence, although a specific action by one person may trigger a specific reaction from another person, that reaction is thought to result from additional motivational factors.

Diagram 5



The Stage 5a perspective (B_1-->B_2)-->B_3) is a closed system (Koplowitz, 1984). Hierarchical systems have idiosyncratic biases. They are complete entities in and of themselves. Once precedent events are causally established and coordinated there can only be one interpretation of causal flow. Systematic perspective-taking fails to invert, or reorganize events. This failure locks out alternative interpretations of how events may effect each other. In complex social situations it is often difficult to establish "fair" and unbiased interpretations of events. In order to take alternative perspectives the individual has to understand the properties of systematic perspective-taking.

Individuals performing Stage 5b perspective-taking reflect on the properties of systematic perspectives.

Stage 5b (5) Metasystematic Perspective-taking

Under the Stage 5b perspective, the individual, besides the Stage 5a schematization of interactions, also has a reordered schematization relating the outcomes of the Stage 5a schematization to further outcomes. Once again, the individual sees new relationships that reorder existing outcomes, as premises that further lead to new behavior. For example, the Stage 5a perspective in Diagram 5, $(B_1 \text{-->} B_2) \text{-->} B_3$ is embedded in more complex reflection, thus: **(**$(B_1 \text{-->} B_2) \text{-->} B_3$**.)** $\text{-->} B_4$. The Stage 5b perspective does not entail operating on the causes of specific actions, nor on the actors in a social situation, as is the case in Stage 5a. Rather, individuals reflect on the logical manner in which the various outcomes in a social situation are linked. Each person's perspective is perceived as a system of logically linked events. The Stage 5b reflection is on different perspectives, or perspective systems, on the form or schematization of the systems, how they are similar and how they differ, whether they are based on similar premises.

Consider the following example of the game of chess. The novice first focuses on specific moves and their immediate outcomes (Stage 4b), and wins pieces, loses pieces, gains the advantage, loses the advantage, etc. In time the novice builds a system of moves (Stage 5a) to gain the advantage and subsequently win the game. In focusing on a sequence of moves, players plan their behavior according to the scheme shown in Diagram 5 (Systematic Perspective-taking): the first move, B_1, sets up the second move, B_2, which together set up the third move B_3,etc. This is a system, where the sequence of moves represents a specific game plan that leads to a desirable outcome. The chess grandmaster, on the other hand, has an arsenal of "gameframes" (systems) from which to choose. Chess grandmasters reflect on the properties of systems of moves and compare them to the properties of other systems. An opponent must also have an arsenal of "gameframes" to counter with. Instead of focusing on a particular sequence of moves, the two players proceed in a dual that involves forcing the opponent into the preferred gameframe. Each player recognizes the other's preferred gameframe and its disadvantage. Thus, these players engage in metasystematic perspective-taking, where whole systems of moves may be used as distractions or faints that obscure other hidden systems, etc.

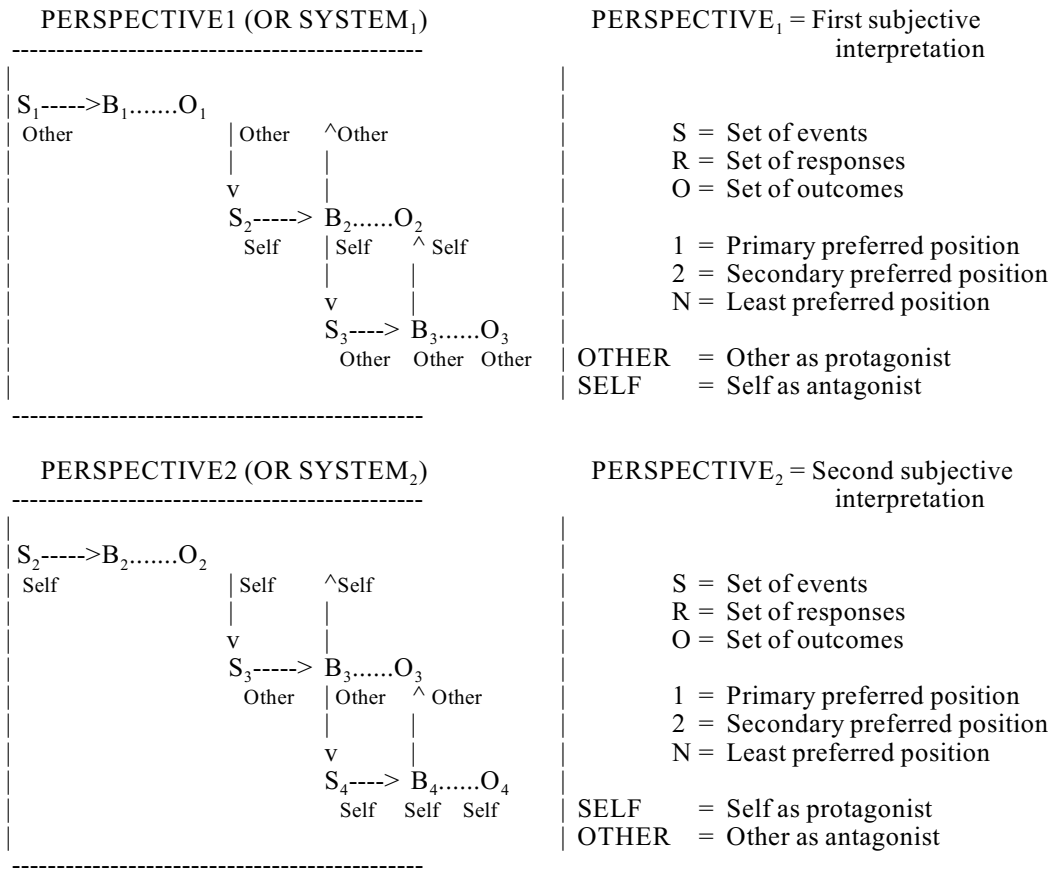
Stage 5b Perspective-taking entails seeing that, each Stage 5a schematization is limited and has a specific objective. With respect to social behavior this infers that systematic perspectives are subjective. Each systematic perspective has a specific goal, to determine a logical sequence of steps to a specific outcome. Diagram 6 shows a metasystematic reflection of two systematic perspectives. Each perspective has its own subjective sequence and hierarchy. Perspective_1 represents one particular frame of reference, to a given situation. Perspective_2 similarly represents another frame of reference. Individuals operating at Stage 5a, place themselves somewhere in their respective systems. The individual operating at Stage 5b sees that the conflicting perspectives have the same properties. However, the individual causal interpretations of specific actions are subjectively organized. For example, while perspective 1 may be an employee who sees the self subjected to the other's (boss) first behavior, perspective 2 (the boss) sees the self as having to subsequently respond to the employee's behavior.

Because of their ability to identify the properties of different perspectives, the Stage 5b perspective believes in universal perspective-taking. There is a belief that all perspective systems can be unified into a super-systems perspective. However, we will see in the next section why this effort fails.

Diagram 6:

STAGE 5, METASYSTEMATIC PERSPECTIVE-TAKING

Two Stage 4 perspective-taking orientations:



Stage 6a (6) Paradigmatic Perspective-taking

Sonnert and Commons (in preparation), derive their Stage 6 notions from the work of Habermas (1982, 1984) and Kohlberg (1984, 1987, 1990). They present the following argument for Stage 6a (Paradigmatic Operations). The Stage 5b attempt to coordinate each perspective that results from a frame into a super system ultimately fails. Arrow (1951) shows that, when there is diversity of preferred choices (i. e. different perspectives or points of reference), there is no scheme for dividing a pie into what each person perceives as three equal parts. Even attempts to formalize voters' perspectives as to what constitutes a fair election fail (Plott & Levine, 1978). A system becomes inconsistent as the demands from different perspectives rise.

The Stage 6a solution is to co-construct perspectives and their associate frames of reference. The "grand" perspective rather than being inclusive and universal, addresses the problem of the formation of frame, what the trade-offs are in selecting one frame versus another. The trade-offs are not utilitarian concerns of Stage 5b, but conceptual, principled concerns. One has to select a frame through the process of co-constructions by all the persons or factions involved.

Stage 6a perspective-taking requires universal collaboration. In practical application, this begins with a dialogue between the proponents of the different perspectives. This dialogue has no preconceived end-point. The dialogue requires individuals to partake in a continuous reflection on the diverse perspectives. The reflection entails recognizing that the laws that hold each perspective system together isolate it from the others. The incompatibility between systems rises from the fact that each system was independently constructed. Each system has a unique set of references (premises). The only way to change this is through collaborative reconstruction of frame.

The purpose of the dialogue is to reach a consensus as to what subset of possible systems' properties should be used to form a consistent framework for a metasystem. To this end, the agents communicate their understanding of each other's viewpoints to one another. In that dialogue, each party reforms their own view of the others' perspective-taking system in light of the other's responses. Their understanding is sufficient when they form a consensus as to what frame of reference might work in the particular situation. That new frame of reference consists of the subset of properties of the different systems. It is chosen to be complete enough to address what was at issue but not so inclusive as to become inconsistent. There are no specific foreseeable outcomes from the process. New possibilities will surface giving rise to new perspectives. These new situations will in turn create new unforeseeable issues and perspectives, and the spiral may continue. In effect then, individuals are not able to perform paradigmatic perspective-taking in solitude. Rather, individuals who can perform metasystematic perspective-taking may engage in tasks that force them to paradigmatically co-construct new perspective frames. The Stage 6a perspective cannot be achieved by a single individual.

Kohlberg (1984), stated that he did not find subjects who performed Stage 6 criterion in the moral domain. He concluded that, Stage 6 represented an ideal end-point for which we strive. I believe that there is a Stage 6 task, but that it cannot be solved by individuals working in isolation. The Stage 6 task requires a group of individuals to reassess their own perspectives in situations where a number of conflicting perspectives exist. This may be achieved through a dialogue process, (Habermas, 1982, 1984), where a number of steps are necessary:

a) Individuals with differing interpretations of a given social situation express their perspectives.

b) Having listened, then the participants each express their interpretations of the others' perspectives.

c) This dialogue continues until all participants are satisfied that their individual perspectives are adequately expressed and understood by the others.

d) Together, all participants then attempt to generate a new framework that allows them to judge existing and new complex situations. At that time if some interpretations differ from others the process is repeated.

Summary

Besides illustrating the higher stages of social perspective-taking, this section has served two important purposes: 1) it diagrammatically illustrates the causation, the linking of actions in the perspective-taking model, 2) it also describes the mathematical organization of the actions at each stage, which has not been done before. The next chapter will review a real social situation that places complex perspective-taking demands on individuals.

Chapter 3
Research Design

My study is largely descriptive and exploratory. Its intent is to broadly explore higher-stage perspective-taking in a particular social setting, the doctor-patient relationship. This is *not* an inferential study. I will not make inferences about population characteristics. Also, my study will *not* investigate the social-perspective taking skills of *doctors*. Rather, this is a *psychophysical* study that assesses subjects' responses to hierarchically complex stimuli embedded in a metasystematic perspective-taking task. The doctor-patient encounter is used because it represents a common occurrence in *adult* life that places complex decision making, and perspective-taking demands on the individuals involved. The situation also lends itself readily to investigations of social-perspective taking. All adults are patients at some time or other, and therefore will be forced to face the issues addressed in this study.

Sample

Eighteen adult subjects were selectively recruited for the present study. The subjects' ages range from 24 to 47. Subjects' educational backgrounds range from entry-level graduate school to doctoral education. This is a "purposeful" sample (Patton, 1990). The subjects in the sample were purposely selected to increase the likelihood of *finding* subjects whose performance would meet the higher stage task requirements. Prior research suggests that random sampling has a low probability of producing subjects who can solve metasystematic tasks. Some examples are, Armon (1984) who found 9% (3 out 32) of a highly selected sample, on The Good-life Interview, and 15.6% (5 out 32) from the same sample on The Moral Judgement Interview; Commons & Richards, (1984) who found only 12% (10 out of 71 graduate student subjects) and Richards (1990), who found 6.25% (2 out of 32 honors undergraduates who scored in the top 5% on the SAT) on the Multisystems Task; Demetriou (1984), who found 11% (13 out of 114 graduate students) on the Metacognitive Task; Kohlberg (1984) who found 13% (8 out of 60, of subjects ages 24 and older) used stage 5 reasoning on the Moral Judgement Interview; and Powell (1984) who reports 9% (4 out of 44 subjects) performed metasystematically. Researchers also generally report finding persons who can perform postformal tasks to be approximately 24 years of age and older (Armon, 1984; Commons, Richards & Kuhn, 1982; Demetriou, 1984; Kohlberg, 1984). These researchers report that education has a moderate to high positive correlation with metasystematic performance (Commons, Armon, Richards, Schrader, 1989). The present sample was selected to meet these criteria.

Lastly, because this study is a descriptive study, the sample size needed only to be large enough to ensure that a sufficient amount of data was obtained to show how subjects who do meet task requirements contrast with subjects who do not. Although this study is primarily interested in subjects' ages and education, Table 4's partial demographic description of the sample includes other attributes: sex, age, education, ethnicity, socioeconomic status.

Table 4.
Sample Attributes (n = 18)

Subject#	Age	Ethnic Background	Economic Class	Sex
01	27	1	4	1
02	23	-	4	2
03	25	8	4	1
04	25	3	4	1
05	30	2	2	1
06	27	1	4	1
07	24	1	4	2
08	33	6	3	1
09	41	1	4	1
10	28	1	4	1
11	39	-	3	1
12	47	3	4	2
13	45	3	4	1
14	35	1	4	1
15	25	1	4	1
16	23	1	4	2
17	25	1	4	1
18	23	1	4	1

Key
Age Number in Years

Ethnicity: White American(A.) =1, Irish A.=2, Semite A.=3, African A.=4, Latino A.=5, Asian A.=6, other=8.
Socioeconomic Class: Lower Lower=1, Upper Lower=2, Lower Middle=3, Upper Middle=4, Lower Upper=5, Upper Upper=6
Sex Female = 1 Male = 2

Procedure

Subjects were interviewed by the myself. Subjects were informed of the purpose of the study. They were told that specific questions pertaining to the study would be answered after the interview. They were told they did not need to sign the consent form until after the interview, and all their questions had been satisfied. Subjects were told that they could stop the interview and rest whenever they needed. As a warm-up exercise, subjects were asked what is a *good* and a *bad* doctor-patient relationship (Armon, 1984). Subjects were then asked to read seven vignettes that comprise the research instrument, the Doctor-Patient Problem (Rodriguez, Commons, & Hill 1990). The interviewer then asked subjects to rate the different vignettes in various ways and to explain the reasons for their ratings. Different questions required subjects to rate different aspects of the vignettes (see below). Further probes were then used to help extract all of the subjects' reasons for their ratings. The interviews lasted between 1 hour and 40 minutes to 4 hours, averaging about 2 and 1/2 hours.

The interviews were recorded using a Dolby B, stereo-HiFi, Marantz/Superscope 340 3-head Stereo/Portable Tape Recorder, and a Sony 16T electrette microphone. The high quality of the tapes, and the fact that the subjects were adults yielded very high quality recordings. The recording were accurately transcribed verbatim.

The Measure

The research instrument is The Doctor-Patient Problem (Rodriguez, Commons & Hill, 1990), see Appendix B. It belongs to a class of problems called multisystems tasks (Commons, Richards & Kuhn, 1982; Richards & Commons, 1984). Such tasks include multiple stories or vignettes that represent different interpretations of, or perspectives on a given social incident. The multisystems tasks here were constructed using the method developed by Commons (Commons, Miller & Kuhn, 1982) and extended to postformal problems by Commons, Richards & Kuhn, (1982). The Commons, Miller, and Kuhn's (1982) laundry problems were derived from Kuhn and Brannock's (1977) plant problem which, in turn, was derived from an earlier plant problem of Linn and Their (1975; Linn, Chen, & Their, 1976, 1977) and Inhelder and Piaget's (1958) pendulum problem. Lastly, Inhelder and Piaget's (1958) problems were in part derived from Binet's intelligence tests.

The Doctor-Patient Problem illustrates a story. The story includes seven vignettes about doctors performing medical treatment in "another country" (see Appendix B). Each vignette describes a doctor with a different perspective for treating patients. The doctors' actions represent different stages of social perspective-taking. The metasystematic perspective-taking task being detected in my research requires respondents to determine how similar ten pairs of doctors are. To perform the task correctly subjects have to differentiate all the perspectives represented in the vignettes, and to order their degree of similarity on an eight point scale.

How the INRC group, and equivalence classification dictate task design The questions in the Doctor-Patient Problem were designed to assess the stages using the General Stage Model (Commons & Richards, 1984) which was derived in part from Piaget's (Inhelder & Piaget, 1958) notion of reflective abstraction. This process says the higher stage action reflectively abstracts lower stage actions by organizing them into a new pattern. The stage of the new action is found by answering the following two questions:

1. What are the organizing actions
2. What are the stages of the elements of the organizing actions.

The INRC group transforms different events and actions into *equivalence classes*. Equivalence classes are a fundamental part of the construction of the present measure and procedures used to score the data. The following line of reasoning introduces equivalence classes and extends the way Piaget's INRC group was used to describe formal operations.

Equivalence relations in mathematics include *identity, equality, logical equivalence* (of abstract propositions is formal operational; of groups of statements is systematic; isomorphism and homomorphism of systems is metasystematic). The nonequivalence relations include greater than, its psychological instantiation preferred over implication, and a somewhat related empirical notion of cause.

James and James (1976) define equivalence in the following manner:
If an equivalence relation is defined on a set, then the set can be separated into classes by the convention that two elements belong to the same class if and only if they are equivalent. These classes are equivalence classes. Two equivalence classes are identical if they have an element in common (p. 137). An *equivalence relation* is a relation between elements of a given set which is a *reflexive, symmetric and transitive* relation and which is such that any two elements of the set are either equivalent or not equivalent (p. 138).

The various forms of equivalence come into being at different stages. For instance, homomorphisms, and isomorphisms are metasystematic forms of equivalence because they relate systems. The particular axioms in simple algebra that define the properties of equivalence are systematic stage elements. They are:

I is an equivalence relation if the relation is

1. Reflexive:

I(a) = a

In algebra,

a = a

2. And if it is symmetric:

I(ab) if I(ba)

In algebra,

a = b if b = a

3. Transitive:

I(ab) = I(bc) if I(ac), in algebra,

In algebra,

a = b and b = c if a = c

A nonequivalence relation (-I) is the negation of an equivalence relation (I).

I(ab) ≠ I(ba).

In algebra,

a > b ≠ b > a

Many complex forms of human behavior are based on an individual's proficiency in *identifying* the relatedness of new stimuli, events, and representations of events (names, labels), even though these stimuli do not resemble one another. For example, in becoming multilingual, people come to understand that the alphabetically written word in English "five", in Spanish "cinco"; the symbol forms "5", "V", and "0101"; and the quantity (■■■■■) all mean the same thing. *Identifying* the relatedness of all of these disparate representations would probably not be a consequence of memorizing all combinations of two representations. Rather, after learning a small number of combinations, all of the remaining pairs would automatically be recognized without the benefit of additional explicit training.

Without accepting that people reason using the INRC group operations of Piaget, or without accepting the INRC group of operations as a definition of *formal* operations, I will illustrate why Piaget considered the *identity* (I) operation to be a *coordination* of propositions. The point is that such a coordination is one stage above the *abstract* stage propositions that are coordinated.

The INRC group of operations describes the logical relations between actions that subjects reasoning at the formal operational stage should be able to do. An operation, I, is the "identity" transformation of a proposition. Applying I to a proposition yields that proposition, I(p) = p. That action is related to a combination of three other actions: I = NRC (**n**egation, **r**eciprocation, **c**orrelation), (I) *identical* transformations.

Consider the causal statement A, written in implicative form (Suppes, 1958):

A: p ---> q
I(A) = A
I(p ---> q) = p ---> q

The N action is a *negation* or an inversion of the statement p ---> q.

N(A) = -A
N(p ---> q) = -(p ---> q)
= p & -q.

Piaget's point is that the subject *compares and contrasts* propositional statements using INRC actions of a formal operational order of hierarchical complexity. The abstract propositions, p, q are at the abstract (beginning formal operational) stage. The coordinations of the abstract propositions are the 16 combinations of I, N, R, C applied to A, see Figure 1.

The I action makes the forming of equivalence classes of abstract stage propositions a formal operational task. By definition then, "coordination" means *identifying* the

Figure 1

A
I(A)
N(A)
R(A)
C(A)
IN(A)
IR(A)
IC(A)
NR(A)
NC(A)
RC(A)
INR(A)
INC(A)
IRC(A)
NRC(A)
INRC(A).

equivalence class of hierarchically ordered actions. The General Stage Model builds on Piaget's basic definition of the INRC. Each postformal stage requires the same group of operations on elements of the previous stage. Therefore, formal operations performs I on abstract propositions, systematic operations performs I on causal statements, and metasystematic operations performs I on systems of causal statements.

Therefore, in the present study subjects' performances are determined by equivalence classes of actions performed by the doctors in the vignettes that they can identify to be similar. The equivalence classes are hierarchical. Each equivalence classes is made up of lower order equivalences. For example, each vignette is made up of many abstract propositions. All the vignettes contain the same number of abstract propositions. Each abstract propositions represents a particular action a doctor performs. However, the written form of the action is varied from vignette to vignette. For instance one vignette may say, "Dr. X said a and b." A second vignette may say "The patient was told b and a by the doctor." A third vignette may say "The Doctor told the patient x and y." The subject is required to identify (I) that the abstract propositions in the first and second vignettes are equivalent. In both cases, the patient is told the same thing, but in different ways. The subject also has to identify that the abstract proposition in the third vignette is not equivalent (-I) to the abstract propositions in the first two vignettes. Thus, the abstract equivalence class is identified, and abstract perspective-taking is performed. By definition each higher stage builds on two or more of the preceding stage actions. Therefore, the next higher stage (formal perspective-taking) requires the subject to identify vignettes that contain two or more similar abstract propositions. That forms a formal stage equivalence class. Systematic perspective-taking requires subjects to identify vignettes that have two or more formal statements in common, and metasystematic perspective-taking requires subjects to identify vignettes that have two or more systems in common. This is how the stages are represented in the present study. Performance is determined by the particular hierarchical equivalence class the subject identifies. Appendix C contains a full technical description of how informed-consent is divided into equivalence classes embedded in the vignettes in the

Doctor-Patient Problem.

Data Coding

Subjects give two types of responses in the present study. The first type of response is a rating on a seven point scale. Subjects rate how similar ten doctor pairs are. The second type of response is an explanation for each of those ratings. The next section describes how subject ratings are coded. Assessment of the ratings will help to answer the first research question: Can the Doctor-Patient Problem detect postformal (Stages 5a, systematic and 5b, metasystematic) social-perspective-taking performance? Assessment of the explanations will help to answer the second research question: What do these subject responses to a postformal perspective-taking task indicate about how they perceive varied social perspectives?

Coding subjects' ratings

Subjects ratings of the ten doctor pairs are coded and scored using techniques from signal-detection theory (Green & Swets, 1966; Swets, 1964; Richards & Commons, 1990), choice theory (Luce, 1959), and the *decision* theory upon which they are built. The signal detection scheme derives the probability that the subject has detected differences, in the vignettes, that require postformal perspective-taking. In the present adaptation of signal detection to stage theory, the underlying assumption is that a subject will detect signals of a specific order of "hierarchical complexity" (signals that represent a given stage). The hierarchical order of the signals subjects identify represents the stage of their performance.

In traditional applications of choice theory (Lee, 1971; Luce, 1959; Swets, 1964), Hits and False Alarms both describe responses that are positive assertions, statements that claim certain events *are* present. Misses and correct rejections, on the other hand, signify negative assertions, statements that claim certain events *are not* present. Table 5 below illustrates the choice matrix.

Table 5.
Choice Analysis Categorization of Task Performance

Staged	*Subject Assertion*	
Stimulus Signal	"Similar"	"Dissimilar"
	Positive	Negative
Signal Present (Similar)	Hit	Miss
Signal Absent (Dissimilar)	False Alarm	Correct Rejection

For example, doctors Casey and Greys are similar with respect to informed-consent. When a subject asserts that Casey and Greys are similar, it is coded a positive assertion and a hit. If the subject asserts dissimilar, it is coded a negative assertion and a miss. On the other hand, Adams and Flynn, are dissimilar with respect to informed-consent. If the subject asserts they are similar, it is coded a positive assertion and a false alarm. If the subject asserts they are dissimilar, it is coded a negative assertion and a correct rejection.

This scoring scheme allows the experimenter to make inferences about the subjects' performance. The inference here is that when subjects get a hit they are performing the stage-required action. This inference is tested in the following manner. Subjects' hits and false alarms are converted to probabilities. The probability of a hit is defined as (Green & Swets, 1966):

p(Hits) = #Hits/(# Hits + #Misses),

and the probability of a false alarm as:

p(False Alarms) =

#False Alarms/(#False Alarms + #Correct Rejections)

The difference between these two probabilities, p(Hits) - p(False Alarms), describes the subject's degree of sensitivity to the stage-specific signal. This sensitivity is represented by values of non-normal *d′*,

non-normal d' = p(Hits) - p(False Alarms),

the difference between the probability of hits and the probability of false alarms (Munsinger, 1970) at a given order of hierarchical complexity (Commons & Richards, 1984b; Kantrowitz, Buhlman, & Commons, 1985). Here non-normal d' will also be referred to as *d′*.[3]

When a subject makes only hits (correct positive assertions), and no misses, or false alarms, then p(Hits) = 1, and *d′* = 1. When a subject makes only false alarms, and makes no correct rejections, the p(FA) = 1, and *d′* = -1. Note, when a subject is guessing, the probability of getting a hit is likely to be the same as the probability of getting a false alarm. Then p(Hits) - p(FA) = 1 - 1 = 0, and *d′* will equal 0, and subjects' performance will fail to show that they have detected the target stage signals. When p(Hits) is greater than p(FA) then *d′* will be greater than 0, indicating that the subject is detecting the given signal. The value of *d′* may therefore vary between -1 and +1. The Fisher Exact test with Overall's correction will determine whether the p(Hits) is statistically greater than the p(FAs), and hence whether the subject has detected the signal. The rating scale allows subjects to scale the relative strength of the multidimensional signals embedded in the vignettes. Vignettes that share many similarities should be rated higher than vignettes that share few similarities.

Example of signal detection and subjects' ratings

Of the ten vignette pairs only one pair shares all the same features, doctors Greys and Casey. They are the metasystematic pair, they are called the "target pair." The ten pairs are numbered 1.01 to 1.10. Greys and Casey are pair 1.10 (see Appendix B). For subjects to obtain a perfect *d′* score they have to assert that only that pair and no other is similar. That would produce a hit and no false alarms, as described above. Thus the subject would be performing metasystematic perspective-taking. The subject asserts that a pair is most similar by rating that pair highest on the eight point rating scale. On the rating scale 0 represents "most dissimilar," and 7 represents most similar. The highest point on the scale (7) is assessed first. If the target pair has been rated 7 that assertion is coded as a hit. Note that the target pair could be rated lower than seven but still be the highest rated pair. When other pairs are rated as high or higher than the target pair those assertions are coded as false alarms. When subjects fail to rate the target pair highest it is coded as a miss. When subjects rate the other pairs lower than the target pair those ratings are coded as correct rejections.

If assessment at the highest point on the scale indicates that the subject has not rated the target pair, the next lower point on the scale is assessed. The same set of codes just described will apply for this assessment. This process is called the "sweep" of the rating scale. The sweep is halted at the rating level that the target pair is asserted. At that time the ten ratings are assessed to determine the total number of hits, false alarms, misses and correct rejections obtained at that rating level. Thus *d′* is determined. If the test for significance fails to show that the subject has differentiated the target pair from other pairs, the subject has failed the metasystematic perspective-taking task.

When subjects fail the metasystematic task then their ratings are assessed again for vignette pairs that meet the next lower stage similarity criterion. In the present example, the next lower stage task requires subjects to detect two vignette pairs that are systematically similar (pair 1.10, & pair 1.07). Note that pair 1.10 is similar both systematically and metasystematically. This is not a problem, all vignettes share an increasing degree of similarity as stage demands drop. The key is to correctly detect the pairs that are similar at a given stage. When the subject asserts that pair 1.10 has the same degree of similarity as pair 1.07, then that response fails the metasystematic criterion, which requires the subject to detect that 1.10 is uniquely different from pair 1.07. For performance to be systematic the subject must rate both pairs higher on the scale than other pairs. The subject's sensitivity to the systematic targets is assessed again as described above. If the subject fails to differentiate the target pairs, then the rating scale is assess again. This time the subject has to give the highest rating to pairs who perform formal perspective-taking similarly, and so on.

Dimensions for exploring subjects' decision rules
Introduction to decision rules

Here, as in much decision analysis (Egan, 1975), simple binary choices are extended to ratings and the decision axis is multidimensional. The control of responding by aspects of the stimuli or stimulus decision dimension, is a *decision rule* (Commons, 1982). In discrimination and rating studies, *implicit decision rules* describe the control of choices or "ratings" by various parameters of the stimuli. Here, there are two dimensions (or variables) that subjects might use implicitly in guiding their ratings. These two dimensions are interrelated, therefore, they are not orthogonal. The first is some form of informed-

consent, (including informing, and consent individually) that does not vary in all vignettes. The second is the stages the vignettes represent. However, note that the stages in the vignettes do not always correspond to informed-consent. For example, two vignettes may represent systematic perspective-taking (stage 5a) but each may also represent a different subset of informed-consent, either "informed" or "consent." This is also true for the lower stages represented in the vignettes. Some vignettes may represent subsets of either "informed" or "consent." Lastly, when considering ordering the differences between pairs of vignettes, the difference may be 0 stages (both represent the systematic stage) but the difference in informed-consent could be eight abstract propositions apart. Subjects must base their decisions on this interaction. When faced with such pairs of vignettes subjects are forced to affix a pivotal rating that addresses the contrast in both dimensions. Alternatively, subjects decisions may be influenced by one dimension more strongly than the other. Therefore, both dimensions (informed-consent & the stage of the doctor) are key parts of ordering similarity. One may contrast these implicit decision rules with *explicit decisions rules* one hears subjects state in their explanations.

The two dimensions are the result of representing a social issue, informed-consent, in a structural model. "Stage" refers to how the social issue is logically, or structurally represented in the vignettes. Informed-consent is the issue that is logically organized. It is divided into elements that form two hierarchically complex systems, "informed," and "consent." Note there are two axes that allow the experimenter to vary "informed" and "consent" toward more, or less completeness. The axes are the logical complexity of each system. At the point where both systems are complete there is informed-consent, and the vignette's hierarchical complexity is Stage 5b. At the point where only one system is complete the vignette represents systematic complexity, Stage 5a.

Here the experimenter infers, that in comparing a pair of doctors, subjects respond to the relative strengths of the two dimensions. To test that hypothesis the following scheme was designed to help determine the relative influence of each dimension on subjects' decisions. The degree of difference between members of each pair is determined by adding all the abstract propositions that a pair does not have in common. That value may range from as high as 8 (the pair is completely different) to as low as 0 (the pair is completely similar). The greater the number of abstract propositions a pair shares the greater the degree of similarity between them, and theoretically the higher they should be rated.

Table 6 shows the degree of difference between the ten doctor pairs. Dimension 1 (informed-consent) is shown first. In Table 6, informed-consent is divided into its various subsets. First the "informed" is presented and the four abstract propositions that it is comprised of *telling about a treatment*, *understanding, side effects and treatment options*. The value presented under the each abstract proposition indicates whether the doctors performed or failed to perform that action. There are two values under each proposition, one for each doctor in that pair. A value of 1.0 means the doctor performed the action. A value of 0.0 means the doctor failed to perform the action. The difference between the two doctors is shown on the right in Table 6. That value is derived by adding up all the propositions each doctor performs, then subtracting one doctor's total from the other's.

Table 6
Decision Rules, two dimensions, informed-consent and Doctor's Stage

Dimension 1, Informed-consent, 2 systems:
Metric system for Informed, Consent, and Informed-Consent
Informed

Doctor Pairs	Abstract Propositions 1	2	3	4	Difference	Total
Adams-Casey	1.0	1.0	1.0	0.0	1.0 0.0	3.0
Adams-Drake	1.0	1.0	1.0	0.0	1.0 0.5	2.5
Casey-Drake	1.0	1.0	0.0	0.0	0.0 0.5	0.5
Casey-Flynn	1.0	1.0	0.0	1.0	0.0 1.0	3.0
Drake-Flynn	1.0	1.0	0.0	1.0	0.5 1.0	2.5
Drake-Greys	1.0	1.0	0.0	0.0	0.5 0.0	0.5
Flynn-Adams	1.0	1.0	1.0	1.0	1.0 1.0	0.0
Flynn-Greys	1.0	1.0	1.0	0.0	1.0 0.0	3.0
Greys-Adams	1.0	1.0	0.0	1.0	0.0 1.0	3.0
Greys-Casey	1.0	1.0	0.0	0.0	0.0 0.0	0.0

Consent

Doctor Pairs	Abstract Propositions 1	2	3	4	5	Difference		Total
Adams-Casey	0.5	1.0	1.0	0.0	0.0 1.0	1.01	1.01	2.5
Adams-Drake	0.5	1.0	1.0	0.0	0.0 0.5	1.01	1.01	2.0
Casey-Drake	1.0	1.0	0.0	0.0	1.0 0.5	1.01	1.01	0.5
Casey-Flynn	1.0	1.0	0.0	1.0	1.0 1.0	1.01	1.01	1.0
Drake-Flynn	1.0	1.0	0.0	1.0	0.5 1.0	1.01	1.01	1.5
Drake-Greys	1.0	1.0	0.0	0.0	0.5 1.0	1.01	1.01	0.5

Flynn-Adams	1.0 0.5	1.0 1.0	1.0 0.0	1.01	1.01	1.5
Flynn-Greys	1.0 1.0	1.0 0.0	1.0 1.0	1.01	1.01	1.0
Greys-Adams	1.0 0.5	0.0 1.0	1.0 0.0	1.01	1.01	2.5
Greys-Casey	1.0 1.0	0.0 0.0	1.0 1.0	1.01	1.01	0.0

Table 6, continued

Informed-Consent			
Doctor Pair	Difference Informed	Difference Consent	Total Pair difference, Informed + Consent
Adams-Casey	3.0	2.5	5.5
Adams-Drake	2.5	2.0	4.5
Casey-Drake	0.5	0.5	1.0
Casey-Flynn	3.0	1.0	4.0
Drake-Flynn	2.5	1.5	4.0
Drake-Greys	0.5	0.5	1.0
Flynn-Adams	0.0	1.5	1.5
Flynn-Greys	3.0	1.0	4.0
Greys-Adams	3.0	2.5	5.5
Greys-Casey	0.0	0.0	0.0

Dimension 2, Stage of the Doctor			
Metric system for the Doctors' Stages			
Doctors' Stages		Pairs	Stage Differences
Adams	5a	Adams-Casey	0
Brown	4a	Adams-Drake	3
Casey	5a	Casey-Drake	3
Drake	3b	Casey-Flynn	1
Evans	4b	Drake-Flynn	4
Flynn	5b	Drake-Greys	3
Greys	5a	Flynn-Adams	1
		Flynn-Greys	1
		Greys-Adams	0
		Greys-Casey	0

The degree of difference for consent is presented next in Table 6. There are five abstract propositions that subjects can find similar: *inferring that treatment is optional*, *making a comparison*, *letting the patient decide*, *engaging in judgement*, and *agreeing to treatment*. Note that certain doctors were given values of 0.5. This value was given to instances where the doctor's actions were unclear. For example, a doctor may "urge" the patient to take a treatment. That can be considered an instance of *inferring that treatment is optional* because the doctor does not simply prepare for treatment ignoring the patient's say altogether, as some doctors do. However, it is not as clear an instance of choice as a doctor who asks the patient if the treatment is accepted. To determine the degree of similarity for informed-consent, the total difference for "informed" and "consent" was added up for each pair.

The bottom part of Table 11 shows Dimension 2: the degree of difference in the stages the doctors' perspectives represent. For example, Adams represents a doctor performing stage 5a actions: Adams only engages in only one system, informing. Casey also only engages in one system, trying to gain consent. Therefore, although the two doctors differ with respect to informed-consent, they are similar with respect to stage. On the left of Table 6 are the stages the seven doctors represent. Of the seven doctors only five are paired for subjects to differentiate. On the right of Table 6 is difference in stage each pair . For example, Drake represents a Stage 3b perspective, Adams represents a stage 5a perspective, the difference between them is 3 stages. Table 6 shows that altogether there are four values for each doctor pair. One value for informing, one for consent, one for informed-consent, and one for stage. A correlation analysis of the four variables presented in Table 6 and subjects' ratings will be presented in the results Chapter (5).

Coding the explanations

The scoring system used here to score the subjects' probed verbal responses is derived from three sources. First, is an application of the General Stage Model (Commons & Richards, 1984a, b). Second, it is based on a scoring system derived from the General Stage Model (GSM) that was used to score multisystems tasks (Commons, Richards, & Kuhn, 1982; Richards & Commons, 1984). Third, it incorporates the General Stage Scoring System (Commons, Johnstone, Straughn, Weaver, Meaney, Lichtenbaum, Krause, Fayer, 1991, July) and its dialectical stage transition scoring method (Commons, Richards, & Sonnert, 1992; Sonnert & Commons, in preparation). See Appendix D for a descriptive review of the General Stage Scoring System (GSSS).

The GSSS hierarchically orders different kinds of performances. Briefly, the GSSS hierarchically increments performances that only partially meet a given stage criterion. These increments are a refined version of Piaget's (1957c) four inter-stage steps, (see also Flavell, 1963; Greco, 1956-1957). The GSSS extends Piaget's scheme to five step (steps 0 through 4) and three substeps interjected between steps 3 and 4 (see Table D-1). The steps and substeps represent different kinds of attempts subjects make when they try to coordinate lower stage actions. A subject's performance is considered to be fully at a given

stage *n* when it meets the step 4 criterion. Performance is transitional when it meets one of the lower step or substep criteria. Note that a score such as Stage 5b, step 3 means that the subject's performance is transitional. The subject has not completely met the Stage 5b criterion. For example, the subject's explanation attempts to coordinate inform with consent, but fails to articulate all the similar actions performed by the doctors that constitute informed-consent.

Scoring subjects' explanations of the ratings is similar to scoring the ratings in that positive and negative assertions are coded as hits, misses, false alarms and correct rejections. The difference lies in how positive and negative assertions are determined, and how the stage of the response is determined. Positive assertions are statements wherein subjects *say* that the doctor pair is similar because both doctors perform certain actions. The subject must describe those actions. Negative assertion are statements wherein subjects *say* that the doctors are dissimilar because they perform different actions. The subject must describe those actions as well. Subjects' descriptions are compared to Tables C-1 through C-4 in Appendix C, which illustrate the equivalence classes. Each table there describes one formal statement (Stage 4b). Together the four tables illustrate all the actions that make up informed-consent (Stage 5b).

Each subject, of course, gives ten explanations, one for each rating of the ten doctor pairs. However, it is not necessary for the experimenter to assess all ten explanations. Here the strategy is to assess the explanation for the metasystematic pair first (pair 1.10). If the subject makes a positive assertion that the pair is similar, and describes a metasystematic relationship (see below for examples of explanations that meet metasystematic criteria), it is scored a hit. Then other explanations are checked for false alarms, descriptions that say the doctor are similar when they are not. If none are found then performance meets the metasystematic criterion. However, if false alarms are found, then performance is transitional. The GSSS is consulted to determine the step or substep of the transition.

When subjects make negative assertions that the target pair is dissimilar, their performance does not meet the given stage criterion. At that point other explanations are assessed. In such cases, explanations that are correct rejections, and provide metasystematic descriptions are scored as transitional performance. The GSSS is consulted to determine the step or substep of the transition. When subjects fail to provide either hits or correct rejections then this whole process in performed again to see if their explanations meet the next lower stage criterion.

Two ways the explanations can demonstrate metasystematic performance There are two ways that the subjects' explanations can meet the metasystematic criterion. The first way is for the subject to verbally lists *all* the actions performed by a pair of doctors that make them similar or dissimilar. Such a description forms a relationship between all the actions performed by the doctors. That relationship forms a metasystematic equivalence class.

A second way to meet the metasystematic criterion is for the subject to *say* how a doctors' actions interact with or affect the patient's actions. That description must articulate whether the doctor's actions include or exclude the patient in the decision making process. Such an explanation coordinates informing with consent thus forming a metasystematic relationship, informed-consent. Note that such a description need not include a listing of "all" the actions that make up informed-consent. However, it does have to describe what actions performed by the doctor affect the patient's role in the informed-consent process.

The following two examples will help to illustrate the two kinds of explanations that meet the metasystematic criterion. The first example is of a description that *lists all the actions* that make up informed-consent. The subject says:

> "I think the doctors are similar because they both tell their patients about a treatment they feel will help the patient, and they discuss its side effects, and other options. They both ask the patient to repeat everything back to make sure the patient understands. They ask the patient if the treatment will be accepted. Also in both cases, the patients then thinks about what the doctor says and prepare for treatment."

That statement is a positive assertion because the subject says that the doctors are similar in that way. Then statement also describes all the abstract propositions that form four formal statements, the *telling*, *understanding*, *obtaining the agreement*, and *preparing for the treatment.* A complete list of similarities forms a relationship between all those actions, a metasystematic equivalence class. An example of the missing statements that would relate informing with consent, without necessarily listing all the actions performed in the vignettes. The subject may say:

> "The doctors are similar because neither really involves the patient in the decision making process. Both doctors only tell about one treatment, neither tells the patient about options and side effects. They do not ask the patient to repeat things back to see if the patient understands. Then they both ask if the patient wants the treatment."

Note that this description does not describe all the elements that make up informed-consent. All of the informing system (*telling,* and *understanding*) has been described but only one statement in the consent system has been described (the *obtaining the agreement*). In it present form, this response would only constitute systematic perspective taking (Stage 5a) because it only describes informing. It does not form a relationship between informing and consent. The missing statements could be:

> "Their patients cannot really make a decision when options and side effects are not discussed by the doctor. Their patients can say 'yes' or 'no,' which means the will or will not be treated. That is not the same as coming to an agreement over many options. Regardless of how these patients respond, they have been left out of the decision making process because they do not know about options and side effects."

These missing statements coordinate the consenting with the informing. The important point of the statement is that the

patient's response is not an informed response, thus it is not informed-consent. Note that the subject also had to say what was missing in the doctors actions. This explanation now meets the metasystematic criterion, Stage 5b because it clearly forms a relationship between informing and consent.

Lastly, the strategy here is to assess the explanation for the metasystematic pair first (pair 1.10). If that explanation meets the metasystematic criterion, then other explanations are scanned for false alarms. In the case that the target explanation does not meet the criterion then other pairs are assessed until the criterion is met. Because the same doctors are paired and repaired with each other, subjects get to describe each doctor's actions four times in ten explanations. Often, rather than repeating a description of a doctor, subjects refer to earlier descriptions of that doctor (e. g. "I told you before all the things that Dr. Casey does, now Dr. Greys is doing the same things"). In such cases several explanations may need assessment. Such a combination of explanations meets the metasystematic criterion only if the subject obtained a hit with the target pair. Otherwise, when a combination of explanations form a metasystematic relationship, the GSSS is consulted to determine the transitional step of the performance.

Chapter 4
Results Part I

Statistical and descriptive analyses of subjects' ratings

The major question is whether it is possible to detect postformal (Stages 5a, systematic and 5b, metasystematic) social-perspective-taking performance with the Doctor-Patient Problem. The answer is that it is possible. To support that answer, a number of results are reported.

To score fully metasystematic, it is not only necessary to detect which doctor pairs are similar but to order the degree of dissimilarity of the other doctor pairs. This is part of differentiating identical from non-identical relations. Using just the rating data alone, it is possible to gain a deep understanding as to what the subjects were sensitive.

The Doctor-Patient Problem Detects Metasystematic Performance

Subject performance shows that some subjects were able to detect the metasystematic doctor-pair from the ten pairs summarized in Question 1. The performances of all the subjects are presented in Table 7 (see below). From left to right, Table 7 shows the subjects' ID number, the ratings they chose for the target pair of doctors, the number of hits, false alarms, misses and correct rejections, the resulting d' score, and the level of statistical significance using Fisher's Exact test with Overall's correction.

Table 7
Sensitivity to Metasystematic Stage 5b, Question 1:

Sub#	Rating	5b item H	FA	M	CR	*d′*	Non-normal *p-Value**
Metasystematic Group 1 (*d′* & Fisher Exact test suggest performance is metasystematic)							
3	6	1	0	0	9	1.000	.0152
6	6	1	0	0	9	1.000	.0151
8	7	1	0	0	9	1.000	.0152
11	6	1	0	0	9	1.000	.0152
13	7	1	0	0	9	1.000	.0152
15	6	1	0	0	9	1.000	.0152
16	6	1	0	0	9	1.000	.0152
Transitional Group 2 (d' & Fisher Exact test suggest performance is transitional)							
1	4	1	1	0	8	0.889	.0455
4	5	1	1	0	8	0.889	.0455
7	6	1	1	0	8	0.889	.0455
9	5	1	1	0	8	0.889	.0455
14	6	1	1	0	8	0.889	.0455
18	5	1	1	0	8	0.889	.0455
Systematic Group 3 (d' & Fisher Exact test suggest performance is Systematic)							
12	5	1	2	0	7	0.778	.0909
2	4	1	3	0	6	0.667	.1515
5	4	1	3	0	6	0.667	.1515
17	3	1	6	0	3	0.333	.5152
Presystematic Group 4 (d' & Fisher Exact test suggest performance is presystematic)							
10	1	1	9	0	0	0.000	1.000

* Fisher's Exact Test with Overall's Correction, 1 tailed (The null-hypothesis is that p(Hits) = p(FAs), the alternate hypothesis is that p(Hits) > p(FAs).

Table 7 shows that seven out of eighteen subjects perfectly detected the identical "no informed-consent" doctor pair on Question 1 ($d' = 1.0$, $p < .0152$). Such a detection is the essential part of the metasystematic task. These subjects gave the highest rating to the doctor pair that was most similar with respect to informed-consent. Also, their performance correctly differentiates the dissimilar doctors. To meet these two demands, subjects had to carry out a multiplicity of transformations, indicating how many values of a variable (informed, consent, and stage of the doctor) would have to be switched for the systems of social perspectives to be identical. Accordingly, they are classified as fully metasystematic performers (Commons, Richards & Kuhn, 1982; Richards & Commons, 1984a, b).

Classifying subject performance on Question 1

Using their *d′* scores on Question 1, subjects were placed into four groups. Table 7 shows the four groups thus formed. Classifying the performances of the subjects on Question 1 is useful for the purpose of further analysis.

Table 7 shows that the metasystematic Group 1 contains the seven subjects ($d' = 1$, $p < .0152$). The transitional Group 2 contains six subjects who were marginally sensitive ($d' = 0.889$, $p < .0455$). Their slightly lower *d′* scores indicate a tendency to confuse systematic similarities with metasystematic similarities. The systematic Group 3 contains four subjects who failed to obtain *d′* values for which the *p*-value was less than .05, but did detect some degree of difference in informed-consent when prompted under a "supported condition." These four subjects clearly had lots of difficulty differentiating the target pair from other pairs, as their high number of false alarms and non-significant *p*-values indicate. The Presystematic Group 4 contains one subject who completely failed the metasystematic task, obtaining $d' = 0$. Assessment of this subject's performance on other parts of the measure indicate that subject 10's performance is presystematic. She had great difficulty identifying relationships in the vignettes higher than formal statements.

How the ratings varied with performance stage

The 7 subjects in Group 1, all perfectly detecting similarity of perspectives, rated the target vignette pair 6 or 7, as shown in Table 7. These highest ratings of the group reflects their confidence in their assertions of similarity of the perspectives described in the target doctor pair. In contrast, the subjects in Group 2, showing marginal detection, $d' = .89$, rated the vignettes slightly lower, ranging from 4 to 6, which indicates less confidence. They all obtained 1 false alarm, which emphasizes some difficulty differentiating the higher stage perspectives.

Group 3 subjects were not only less confident, giving the next lowest ratings of 3 to 5, but also obtained a high number of

false alarms. Their *d'* values are not significant, indicating they have great difficulty differentiating the metasystematic perspectives from lower stage perspectives. The subject in Group 4 rated the target vignette pair lower than all the other pairs. This person appears to be insensitive to the metasystematic signals embedded in the vignettes. The qualitative assessment in Part 2 of this chapter reveals how well Subject 10 understood the task. The range of the groups' ratings suggest that the greater the difficulty subjects have differentiating the vignettes, the less confident they are about the target pair.

The sweep: assessing how well subjects differentiated the Stage 5a vignettes

Table 8 (see below) shows subjects' sensitivity scores on the Stage 5a vignettes. The reader is reminded that the Stage 5a criterion requires detection of vignettes that are similar only in how the doctors informed or attempted to gain consent, not both. Note that many subjects said they had difficulty with rating scales, and particularly knowing just how to rate all of the vignettes. Table 8 shows subjects' sensitivity to Stage 5a perspectives. It contains the subjects' ratings, hits, false alarms, misses, correct rejections, the *d'* scores for Stage 5a, and Stage 5b on the right for comparison.

Table 8
Sensitivity to Systematic Perspectives Stage 5a, Question 1

				5a				5b	
Sub#	Rating	H	FA	M	CR	d'	p-Value†	d'	p-Value†
Metasystematic Group 1 (d' & Fisher Exact test suggest performance is metasystematic)									
3	5	2	1	0	7	0.875	0.0182	1.000	0.0152
6	4	2	2	0	6	0.750	0.0455	1.000	0.0152
8	6	2	0	0	8	1.000	0.0045	1.000	0.0152
11	4	2	1	0	8	0.875	0.0182	1.000	0.0152
13	6	2	1	0	7	0.875	0.0182	1.000	0.0152
15	5	2	0	0	8	1.000	0.0045	1.000	0.0152
16	5	2	2	0	6	0.750	0.0455	1.000	0.0152
Transitional Group 2 (d' & Fisher Exact test suggest performance is transitional)									
1	4	1	1	1	7	0.375	0.1273	0.889	0.0455
4	3	2	5	0	3	0.375	0.1273	0.889	0.0455
9	5	2	0	0	8	1.000	0.0045	0.889	0.0455
14	6	2	0	0	8	1.000	0.0045	0.889	0.0455
18	5	1	1	1	7	0.375	0.1273	0.889	0.0455
7	6	1	1	1	7	0.375	0.1273	0.889	0.0455
Systematic Group 3 (d' & Fisher Exact test suggest performance is Systematic)									
12	5	2	1	0	7	0.875	0.0182	0.778	0.0909
2	4	2	2	0	6	0.750	0.0455	0.667	0.1515
5	4	2	2	0	6	0.750	0.0455	0.667	0.1515
17	3	2	5	0	3	0.375	0.4909	0.333	1.0000
Below Systematic Group 4 (d' & Fisher Exact test suggest performance is presystematic)									
10	2	1	3	1	5	0.333	1.0000	0.000	1.0000

† Fisher's Exact Test with Overall's Correction, 1 tailed. The null-hypothesis is that

p(Hits) = p(FAs), the alternate hypothesis is that p(Hits) > p(FAs).

Performing the "sweep" of the rating scale not only shows subject detection of the Stage 5a vignettes, it also shows how well subjects differentiate the non-metasystematic pairs. For example, the sweep reveals whether subjects correctly differentiated Stage 5a perspectives from lower stage perspectives. Question 1 was designed primarily as a metasystematic task. A subject's sensitivity is challenged by vignettes that on the surface appear similar but represent adjacent stages. Subjects in transition should exhibit greater difficulty coordinating those differences.[4]

Table 8 shows that of all groups, Group 1 did the best job of differentiating the non-metasystematic vignettes. All of the subjects in Group 1 differentiated the systematic pairs, as their d' scores and p-values indicate. Two subjects, 6 and 16, performed marginally, ($d' = .7500$, $p < .0455$). They obtained two false alarms asserting that Drake is similar to both Casey and Greys. However, although somewhat similar to both Casey and Greys, Drake does not share the same degree of similarity with them as they do with each other (Table 6 shows the degree of difference between all pairs).

In contrast to Group 1, most of the subjects in Group 2 (transitional performance) were not able to differentiate the lower stage perspectives. That means they were not able to perform all the necessary combinations of the variable informed-consent. The hypothesis that subjects in Group 2 are not truly metasystematic performers is thus supported. Subjects' 9 and 14 obtained perfect sensitivity scores ($d' = 1$) with respect to the Stage 5a criterion, thus showing a stronger sensitivity to Stage 5a task demands than Stage 5b demands. However, the fact that subjects in Group 2 were able to differentiate the metasystematic vignettes suggests that they are more sensitive to the higher stage perspectives than subjects in the systematic group.

The scores for all four subjects in the systematic Group 3 improved given the lower stage criterion. Three of the four subjects, who had failed to detect the metasystematic vignettes, were able to detect the systematic vignettes. Subject 12 performed best, ($d' = .875$, $p < .0182$), and subjects 2 and 5 slightly lower, ($d' = .75$, $p < .0455$). Unlike the subjects in the transitional group, these subjects were not able to detect the metasystematic perspectives, and exhibited better sensitivity to systematic perspectives. That supports the hypothesis that they are systematic performers. Subject 10 in the presystematic group appeared to show improvement, however, her $d' = .333$ did not lead to rejection of the null hypothesis ($p < 1.0$).

In summary, the "sweep" of the ratings shows that subjects who performed fully metasystematic perspective-taking also differentiated the systematic vignettes from lower stage vignettes. That supports their perfect detection scores of $d' = 1$. The performance of subjects in the transitional group fluttered, some responding perfectly to the systematic perspectives while others' performance deteriorated. That supports their lower d' scores, which indicated they were confusing higher stage perspectives with lower stage perspectives. In contrast, the improved scores for three of the four subjects in the systematic group support their non-significant d' scores for detection of metasystematic perspectives.

Descriptive analysis of subject performance

The next sections will investigate predictors of the subjects' ratings. A correlation analysis within each subject between the information embedded in the vignettes and the subject's ratings of the doctor pairs will help explain subjects' ratings. The correlation analysis helps understand the decision rules that the subjects are using when responding to the information embedded in the vignettes. Also, the subjects' performances on five additional questions representing different developmental testing styles will be presented in support of the *d′* analysis.

How the information embedded in the vignettes predicts the ratings

The question addressed here is: Do subjects who obtained *d′* = 1 scores in their perspective-taking use more of the information in the vignettes than subjects who perform transitionally, and subjects who perform systematically, etc.? Another way to look at these results is to ask to what extent do these subjects use all the information necessary for metasystematic performance. To the extent to which the higher-stage performing subjects use all the information, the results generally support the *d′* assessment.

Decision rules for different stage groups

The *d′* scores defined four subgroups: metasystematic, transitional, systematic and presystematic perspective-taking. Hypothetically, subjects performing metasystematic perspective-taking should detect more of the information embedded in the vignettes than subjects in the other (lower stage) groups. The results of the correlation analysis support that hypothesis.

Table 9 (see below), shows subjects' performance on both parts of the metasystematic task. On the left are the subjects' sensitivity scores (*d′*) to the Stage 5a perspectives. In the center are the subjects' sensitivity score to the Stage 5b perspectives. On the right of Table 9 are estimates between the subjects' ratings and the information embedded in the vignettes for each subject. The abbreviated predictors represent the different information embedded in the vignettes, as described in Table 6 (see above) and the section on equivalence classes. DIFIC is a measure of the *difference* in how the doctors in the vignettes go about obtaining informed-consent. DIFSD is a measure of the difference in the perspective-taking stages of the doctors in the vignettes. The correlation coefficients indicate how well this information is related to subjects' ratings, for each subject. Note that the correlations reflect how well subjects differentiated all the vignettes not just the target pair.

Table 9.
Decision rules help to explain subjects' responses to Question 1

	5a		5b		Correlations between ratings & predictors	
Sub#	*d'*	*p-Value*	*d'*	*p-Value*	DIFIC	DIFDS
Metasystematic Group 1 (*d'* & Fisher Exact test suggest performance is metasystematic)						
3	0.875	0.0182	1.000	0.0152	-.58	-.39
6	0.750	0.0455	1.000	0.0152	-.84	-.17
8	1.000	0.0045	1.000	0.0152	-.80	-.39
11	0.875	0.0182	1.000	0.0152	-.76	-.38
13	0.875	0.0182	1.000	0.0152	-.06	-.76
15	1.000	0.0045	1.000	0.0152	-.48	-.62
16	0.750	0.0455	1.000	0.0152	-.83	-.24
Average					-.62	-.42
Transitional Group 2 (*d'* & Fisher Exact test suggest performance is transitional)						
1	0.375	0.1273	0.889	0.0455	-.57	-.02
4	0.375	0.1273	0.889	0.0455	-.43	-.32
7	0.375	0.1273	0.889	0.0455	-.47	.37
9	1.000	0.0045	0.889	0.0455	-.36	-.30
14	1.000	0.0045	0.889	0.0455	-.79	-.31
18	0.375	0.1273	0.889	0.0455	-.19	-.38
Average					-.47	-.28
Systematic Group 3 (*d'* & Fisher Exact test suggest performance is Systematic)						
12	0.875	0.0182	0.778	0.0909	-.57	-.22
2	0.750	0.0455	0.667	0.1515	-.73	-.25
5	0.750	0.0455	0.667	0.1515	-.08	-.58
17	0.375	0.4909	0.333	1.0000	.41	-.42
Average					-.24	-.37
Presystematic Group 4 (*d'* & Fisher Exact test suggest performance is presystematic)						
10	0.333	1.0000	0.000	1.0000	.09	-.17

The correlations on the right side of Table 9 support the hypothesis that Group 1's ratings are strongly influenced by the difference in how the doctors attempt to gain informed-consent, and by the difference in the perspective-taking stages of the doctors. The correlations for subjects in Group 1 also support the *d'* assessment that these subjects used more of the information in the vignettes than subjects in other groups. The other groups' correlations scores tend to be lower in magnitude, as the averaged correlations show. Note that these are negative correlations, indicating that the greater the "difference" the lower the rating, marking dissimilarity.

Four subjects' ratings in Group 1 correlated highest with the level of informed-consent represented in the vignettes, Subject 11, $r = -.76$; Subject 8, $r = -.80$; Subject 16, $r = -.83$; and Subject 6, $r = -.84$. Two subjects' ratings correlated moderately with informed-consent, Subject 15, $r = -.48$, and for Subject 3, $r = -.58$. These results suggest that these subjects' ratings were influenced by how different the doctors are with respect to informed-consent. In contrast, subject 13's ratings did not correlate well with informed-consent, $r = .06$. Instead, subjects 13's ratings correlated moderately high with the difference in stages of the doctors $r = -.76$. Similarly, subject 15's ratings correlated somewhat higher with the difference of the stages of the doctors than with informed-consent, $r = -.62$, and $r = -.48$ respectively. The results for these two subjects suggest their ratings were influenced by how similar the doctors are with respect to the perspective-taking stages. Overall the correlations for Group 1 support the hypothesis that there are two types of information that can inform metasystematic perspective-taking. Subjects can be sensitive to the specific issue of informed-consent, they can be sensitive to the different perspective-taking stages the vignettes represent, or both.

For subjects whose performance was in transition to metasystematic perspective-taking (Group 2) the ratings correlate somewhat less with informed-consent. Their ratings tend to correlate moderately with the doctors' similarity in informed-consent and perspective-taking stages. The one exception is Subject 14 whose ratings correlated well with informed-consent, $r = -.79$. That correlation suggests that Subject 14 did a better job of responding to informed-consent than the other subjects performing transitional metasystematic perspective-taking. Actually the qualitative data support Subject 14's correlation score. In contrast, Subject 18's ratings correlate more with the stages of the doctor's perspectives than with how similarly they

perform informed-consent, r = -.38. The qualitative data supports Subject 18 transitional performance.

These generally lower correlations than those of subjects in Group 1 support the *d'* assessment that the subjects performing transitional perspective-taking did not respond as well to the information embedded in the vignettes as subjects performing metasystematic perspective-taking.

For subjects whose performance was systematic, the ratings tend to correlate moderately with informed-consent as well. As noted in the *d'* analysis, these subjects were more sensitive to the Stage 5a perspectives than to the Stage 5b perspectives. Subject 2 is the one exception, his ratings appears to have been strongly influenced by informed-consent, r = -.73. In contrast, Subject 5 appears to respond to the perspective-taking stages of the doctors, r = -.58. These moderate correlations suggest that the subjects performing systematic perspective-taking used about as much of the information embedded in the vignettes as subjects performing transitionally. Subject 2 may be the exception having done a better job at responding to informed-consent.

Lastly, subject 10's ratings correlate weakly with both informed-consent and the stages of the doctors, r = .09 and r = -.17. Note that Subject 10 was the only subject who failed to perform both the metasystematic and systematic criteria. These correlations support the *d'* analysis that subject 10 does not use the information embedded in the vignettes well as subjects performing higher stage perspective-taking.

In summary, the correlation analyses generally support the *d'* analyses that subjects performing metasystematic perspective-taking (Group 1) detected more complex relationships between the vignettes than subjects performing lower stage perspective-taking (groups 2, 3 & 4). The correlations also suggest that subjects whose performance was in transition to metasystematic perspective-taking did not necessarily use more of the information embedded in the vignettes than subjects performing systematic perspective-taking. Lastly, the correlation results suggest that the one subject who failed to detect systematic and metasystematic relationships (Group 4), did not respond to the information embedded in the vignettes.

Results Part II
Qualitative analysis of subjects' explanations (Dialectical responses)

The qualitative analysis presented in this chapter helps to answer the second research question: What do subjects' responses to a postformal perspective-taking task indicate about how they perceive varied social perspectives. Through an analysis of three subjects' dialectical responses, this chapter will illustrate how subjects performing at different perspective-taking stages perceive varied social perspectives. The three examples to be presented here represent metasystematic, systematic and presystematic perspective-taking.

Analysis of three subjects' explanations

The following three persons analyses will illustrate how subjects performing postformal perspective-taking perceive varied social perspectives. Each of the following subjects performs at a different perspective-taking stage. Note that these examples do not do justice to the overall dynamism of the subject's performance across all ten explanations. However, such a comprehensive analysis is beyond the scope of this thesis. The first subject performs metasystematic social perspective-taking.
Subject #3

The subject is a Finnish woman who was awarded a full graduate-school scholarship to study in the United States. Her english is a little broken at times but her main ideas are clear. Subject 3 asserts that the target pair (Dr. Casey and Dr. Greys, question 1.10) is similar and relates how they are so.
S = subject, I = interviewer
S: "I think they are very, very similar. Because in both cases, again, the doctors have this particular treatment in their mind. They will not give some reasoning behind it. Dr. Casey says it's highly accepted. It's used in this clinical community. Success rates are pretty good. It cures most of the patients and so on. The same with Dr. Greys. He shows those, probably, nice graphs there [in the medical journals]. You know how well this treatment really works. Also they point out how this treatment has helped the patients in Dr. Casey's case. Dr. Greys points out about this journal article. Both of them, when I really focus...these treatments have good results and so on. So, they have this particular treatment in their mind and little bit different ways they try to come up with evidence as [to] why this is really the best treatment. They are very similar that way. And also about the way the patient is asked to decide about the treatment will be taken, and in the other case, in Dr. Greys case the patient is asked is she would like to start the treatment. So, it's not just told her okay, accept the treatment, tomorrow be prepared. However, again there is not really that choice. You are given a choice, the way we ask you know, it's like I would ask, Joe would you like coffee or tea, but I'll just have coffee-- what are you going to get? You're just going to get coffee. In that way I feel that they are very very similar. What is a little dissimilar is that overall in Dr. Grey's case seem to be very detached. As a person that comes to a doctor's office, I really want to know whether my cousin got treated with the same treatment and got good results, or someone I would know instead of something like the Nobel Prize, this really great treatment. Everything is very powerful and detached and numbers and hard things. It would be nice to have both of them. This has had the Nobel Prize and so on, and Jenny who is also a patient of mine, was treated well with this."

The subject begins by asserting that the doctors are similar in how they present the treatment to the patient (a positive assertion). The subject describes how the doctors *tell* the patient about the treatment. The subject acknowledges that the specific actions taken by the doctors' appear different, but she classes them as equivalent: "in both cases, again, the doctors have this particular treatment in their mind. They will not give some reasoning behind it. Dr. Casey says it's highly accepted. It's used in this clinical community. Success rates are pretty good. It cures most of the patients and so on. The same with Dr. Greys. He shows those, probably, nice graphs there [in the medical journals]...You know how well this treatment really works. Also they point out how this treatment has helped the patients in Dr. Casey's case. Dr. Greys points out about this journal article. Both of them, when I really focus...these treatments have good results and so on. " By saying that these actions are the same, the subject is forming an equivalence class. These actions belong to the formal statement *telling* (Stage 4b). note that the *telling* is one of the formal statements that make up the informing system.

Subject 3's then continues with another formal coordination. She coordinates *inferring the treatment is a suggestion* and the *leaving the decision* to the patient. Two abstract propositions that form the first formal statement in the consent system. "And also about the way the patient is asked to decide about [whether] the treatment will be taken, and in the other case, in Dr. Greys case, the patient is asked if she would like to start the treatment. So, she's not just told 'okay, accept the treatment, [but] tomorrow be prepared." The coordination of the two formal statements allows the subject to see that there is something missing in the way the doctors present the treatment to the patient. The subject acknowledges that the doctors are not actually *demanding* that the patient take the treatment. But she infers that they are similarly forceful. Thus the subject is dissatisfied with the two formal statements, *telling* from the informed system and *obtaining the agreement* from the consent system.

The subject continues to coordinate informing with consent, saying: "However, again there is not really that choice [of treatment options]. You are given *a* choice, the way we ask you know, it's like I would ask, Joe would you like coffee or tea, but I'll just have coffee. What are you going to get? You're just going to get coffee. In that way I feel that they are very very similar." That statement notes that neither doctor has offered treatment options, as the tea and coffee metaphor illustrates. The coordination of the limited degree of *telling* with the *obtaining the agreement,* asking the patient to decide leads the subject to conclude that a patient can only assent to, or dissent from the doctor's preferred treatment.

Thus to this point the subject has coordinated offering of one treatment, with offering of no options, this forms the formal statement *telling*. She has also coordinated the *telling* with the *obtaining the agreement*, thus forming a systematic comparison of the doctors' behavior. Note, however, that various elements are still missing from the subject's description. For example, the subject has not discussed side effects, nor the actions that form the formal statement *understanding*. Often subjects do not articulate all of their reasons for ratings the doctors because they have described the doctors elsewhere in the task.

Hence, the subject's response to doctors Greys and Adams (question 1.09) is assessed to determine if she provides the missing information that would meet the metasystematic criterion. In that explanation the subject first describes the *telling* and then describes the *understanding*.

> "...both doctors asked if they [the patients] mind this one particular treatment and somehow they have to come up with this evidence which is some powerful influential thing that their patient will chose this [that will cause their patient to choose this treatment]. Dr. Greys uses that it is in a 'medical journal.' 'This treatment got the Nobel Prize' and everything so it's a really good treatment. 'Believe me.' Dr. Adam's says 'the hospital has studied this and prefers this, and well known doctors also use this and an expert has found that this is really good treatment.' So they both sort of use power, not really describing from an objective point of view. That is very similar [between the doctors]."

Here the subject has delineated all the elements that form the *telling*, and we know from her description to question 1.10 that she has coordinated the relevant actions performed by the doctors. Next she describes the *understanding*.

> "What is different [between the doctors] is the making sure the patient understands that. At least Dr. Adams puts an effort there. He asks the patient to repeat the information to make sure that she understands. He also describes some other treatment options and side effects. Again, what is similar in both cases, like the indirect way they want to throw their end [force their preferred treatment], well there may be some other choice but they really don't give the choice to the patient. Dr. Adams describes his treatment options, I mean different ones, there are these others and they have these and these side effects. However, he doesn't really give a choice. He just asks the patient to be prepared to start this particular treatment. There is no choice. So, it's more like he's trying to justify why this particular treatment is good. In Dr. Greys case, there the choice is given again, sort of [in an] indirect way. Which is not really that the option would be there. The doctor asks if the patient would like to try the treatment. You know, do you want to try this? The patient can say no, but there is really no other option that the patient would... 'No' means that you're not going to get treated at all because Dr. Greys hasn't described any other treatments."

In this response the subject starts by giving a negative assertion that the Greys and Adams are dissimilar: "What is different [between the doctors] is the making sure the patient understands that." That response is a correct rejection of similarity between the doctors. Next, in describing what actions are missing in Dr. Greys' vignette the subject gives a clear description of the actions that form the formal statement *understanding* and coordinates the *understanding* with the *telling*. "At least Dr. Adams puts an effort there. He asks the patient to repeat the information to make sure that she understands. He also describes some other treatment options and side effects." That statement relates *telling about options* and *side effects* with asking the patient for a *demonstration of understanding* all of that information. The subject has formed a systematic relationship (an equivalence class) which the doctors fail to meet. The doctors are not equivalent in these ways.

Then the subject focuses on the consent system. She asserts that Dr. Adams's informing is inadequate because the patient is not afforded the opportunity to agree with the doctor's decision (*obtaining the agreement*): "...he [Dr. Adams] doesn't really give a choice. He just asks the patient to be prepared to start this particular treatment." That statement coordinates the informing with one formal statement from the consent system, *obtaining the agreement*. The subject's point is that asking the patient to prepare for treatment is not same as asking the patient to decide among treatment options. Dr. Adams does not provide the patient an opportunity to agree with the decision. When Subject 3 coordinates the informing system with the formal statement *obtaining the agreement* she concludes: "So, it's more like he's [Adams's] trying to justify why this particular treatment is good." Dr. Adams's informing is more like a "justification" because the patient is not afforded the opportunity to participate in the decision. Subject 3's point is that *obtaining the agreement*, which she clearly articulates in her response to question 1.10, is missing in Dr. Adams's actions.

Subject 3 then says what is missing in Dr. Adams's vignette by contrasting it to Dr. Greys's consent system: "In Dr. Greys case, there the choice is given, again, sort of [in an] indirect way. Which is not really that the option would be there. The doctor asks if the patient would like to try the treatment. You know, do you want to try this?" Here again the subject sees that Greys does a better job of asking the patient to choose, but does not offer options, does not completely inform the patient.

Then the subject coordinates the final formal statement from the consent system. She articulates the patient's role in the process (*preparing for the treatment*): "The patient can say no, but there is really no other option that the patient would... 'No' means that you're not going to get treated at all because Dr. Greys hasn't described any other treatments." The subject's point is that if the patient were not to prepare for the treatment by saying "no" then the patient would not be treated at all because, in contrast to Dr. Adams, Dr. Greys does not offer options.

Therefore, Subject 3's explanation coordinates all the elements that make up inform-consent. The combination of the two explanations to questions 1.10 and 1.09 meet the metasystematic criterion. Subject 3 has performed metasystematic perspective-taking (Stage 5b, step 4).

Note that it is not necessary to assess all ten of the subjects' explanations. Generally, the lower the stage of the subject's performance, the more verbal explanations that have to be assessed to determine if they ever meet the higher stage criteria. The highest stage criterion any response or combination of responses meets is the stage of the subject's performance.

Subject #2

The second subject helps to illustrate how subjects performing systematic perspective-taking perceive the same two pairs of vignettes (questions 1.09 and 110). This subject's responses tended to be rather brief and incomplete. It was necessary to assess all ten explanations in search of a metasystematic response. The subject's responses never met the metasystematic criterion (Stage 5b) either singly or jointly. However, the subject's explanations to questions 1.10 and 1.09 conjointly met the systematic stage criterion (Stage 5a). We will first review the subject's explanation to question 1.10 (doctors Greys and Casey) then move on to his explanation to question 1.09 (doctors Greys and Adams). The subject first appears uncertain and asserts that the target pair of doctors (Greys & Casey) are very dissimilar:

I: In what ways do you find Dr. Casey's views to be similar to Dr. Greys?

S: "OK I'd give him a two also. Oh no wait a second, let me withhold the number for just a second. But um I'd say that they're very very different in that Casey is basically um uh trying to sell a certain treatment by pointing out um how it's helped various patients and you know how like individual people have benefitted from it. Whereas Dr. Greys is trying to sell his treatment based on sort of sciency claims like results in a Nobel Prize, the journals regard it highly, things like that."

The subject starts by making a negative assertion saying the doctors are "very very different." The subject bases his conclusion on a comparison of two abstract propositions that make up the formal statement *telling*. The first abstract proposition is *offering the treatment*, the subject says "Casey is basically um uh trying to sell a certain treatment..." That is contrasted to Dr. Greys "Whereas Dr. Greys is trying to sell his treatment..." Note that the subject has equated the doctors actions. Both doctors appear to "sell" their treatments. What makes the *offer the treatment* appear like "selling" is the way the doctors justify using it. Rather than discussing the treatment's side effects and comparing it to other options (the second abstract proposition: *telling about side effects*), the doctors do other things. The subject says that Casey "sells" his treatment "...by pointing out um how it's helped various patients and you know how like individual people have benefitted from it." In contrast, Dr. Greys's equivalent action is to "sell his treatment based on sort of sciency claims like results in a Nobel Prize, the journals regard it highly, things like that." Therefore, the subject has related all the actions in one formal statement (the *telling*) by saying that the doctors both sell their treatments. That indicates formal perspective-taking. However, asserting that the doctors are dissimilar is a formal perspective-taking miss. Therefore, according to the GSSS the subject's response meets the Stage 4b, substep 3 criterion (transitional). The subject's performance so far is preformal perspective-taking. The subject was probed to see if he simply had not articulated further reasons for his rating:

I: "Can you tell me a little more about that?"

S: "Well um. OK um in deciding, well, in deciding that a treatment that's accepted by quote the clinical establishment, is a good treatment Casey probably is sampling fewer opinions and less criticism of those opinions than Greys is in choosing a you know the preferred option of the journals because the clinical establishment sounds like you know sort of an old boys network where there's less critical discussion of different options and you know less access to information about those options. You know in journals its all laid out in print with references. OK so that's about it on a journal versus

establishment. I guess uh the last thing is that they're similar in that they both ask the patient to decide whether they'd want to go through with the treatment or not which I think is important like I said before. So I think that's about all I have to say about them. Oh and I didn't decide to give them a number yet."

I: "No?"

S: "I would I guess, let me try to I guess I give them about a four."

I: "OK Are there any other ways in which they are either similar or dissimilar that you can think of?"

S: "NO."

In response to the probe, the subject first describes specific actions that further describe the same abstract proposition *telling about the treatment*. In the subject's earlier statement he abstractly said that the doctors tried to "sell" their treatments this time he more specifically asserts that there is a difference between Casey's "clinical establishment" and Greys's "medical journals." Note that this difference only makes sense at the abstract propositional level. With respect to informed-consent these differences are irrelevant because neither action informs the patient of more pertinent things like treatment options, side effects, who makes the decision, etc.

In his closing statement the subject describes one additional abstract proposition from the consent system, *obtaining the agreement*: "I guess uh the last thing is that they're similar in that they both ask the patient to decide whether they'd want to go through with the treatment or not which I think is important like I said before." Three things occur in that statement: one, it is a correct positive assertion, both doctors do ask their patients to decide if they want the treatment. Two, in saying the doctors are the same in that way the statement forms an equivalent relationship, albeit an abstract propositional relationship (Stage 4a). Three, the statement says that these actions are "important." Presumably the subject means it is important for the patient, in which case the patient's needs are being coordinated with the doctor's actions. However, that is not clear from the statement as it stands. The subject does mention that he has discussed the importance of these actions before. Therefore it is possible that the subject has offered a higher stage answer somewhere else in the task.

Lastly, the subject changes his rating from dissimilar (two) to more similar "four." That is now a hit. It appears that as the subject continued to reflect on the doctors actions their similarity became more apparent. However, as pointed out above because that positive assertion is based on formal statements it does not meet metasystematic nor systematic perspective-taking criteria. The statement does fully meet the formal perspective-taking criterion (Stage 4b). In cases like this the experimenter assesses the subject's responses to other questions. It is possible that a combination of responses will meet a higher stage criterion. In fact, that is the case. The subject's response to question 1.09 (Dr. Greys & Dr. Adams) reveals a clear systematic coordination of the elements that make up the informing systems:

I: "Drs. Greys and Dr. Adams. In what ways do you find the doctors views to be either similar or dissimilar to?"

S: "How many of these [doctor pairs] are there? I'm getting sort of repetitive. I'm just saying the same things about all these guys over and over again."

I: "Yeah it [the task] gets a little bit tedious in that way."

S: "These guys I would also give about a two to."

I: "In what ways . . ."

S: "So they are dissimilar in that Adams outlines lots of different treatment options and their side effects. Greys simply outlines one single treatment option and doesn't do much justice to potential side effects um. Adams goes ahead and makes sure the patient understands what's going on by having him repeat the results and listening to make sure the patient actually repeats it correctly. Greys almost takes pains to make sure the patient doesn't understand what's going on by snowballing him with the talk of Nobel Prizes and waving journal articles in their face. And uh yeah I guess I'd say that Adams has, I keep on getting back to this, Adams has an awfully personal approach; Greys has an extraordinarily impersonal approach. But I guess they're both similar in that they seem to want to try to enlist the support of the patient in going through with the treatment. And I guess they're also similar in that they, they're both recommending one of the treatments by making references to some of its good results. And that's about it.

"So they are dissimilar in that Adams outlines lots of different treatment options and their side effects. Greys simply outlines one single treatment option and doesn't do much justice to potential side effects um. Adams goes ahead and makes sure the patient understands what's going on by having him repeat the results and listening to make sure the patient actually repeats it correctly. Greys almost takes pains to make sure the patient doesn't understand what's going on by snowballing him with the talk of Nobel Prizes and waving journal articles in their face. And uh yeah I guess I'd say that Adams has, I keep on getting back to this, Adams has an awfully personal approach; Greys has an extraordinarily impersonal approach. But I guess they're both similar in that they seem to want to try to enlist the support of the patient in going through with the treatment. And I guess they're also similar in that they, they're both recommending one of the treatments by making references to some of its good results. And that's about it."

Here the subject makes a negative assertion "they [Greys and Adams] are dissimilar in that..." and gives them a rating of "two." That is a correct rejection both metasystematically and systematically because the doctors differ with respect to both informing, and consent. Greys does not inform but attempts to gain consent while Adams informs but does no attempt to gain consent. The subject describes all the actions that make up the informing system as reasons for the doctors' dissimilarity. First he describes the actions that make up the *telling about treatment* and the *telling about side effects*: "...Adams outlines lots of different treatment options and their side effects. Greys simply outlines one single treatment option and doesn't do much justice to potential side effects." That together with the last sentence in the statement completes the formal statement *telling*: "I guess they're also similar in that they, they're both recommending one of the treatments by making references to some of its good results." These statements fully describe the formal statement *telling* (Stage 4b).

Then the subject relates the *telling* with a second formal statement, the *understanding*: "Adams goes ahead and makes sure the patient understands what's going on by having him repeat the results and listening to make sure the patient actually repeats it correctly. Greys almost takes pains to make sure the patient doesn't understand what's going on by snowballing him with the talk of Nobel Prizes and waving journal articles in their face." That statement relates exactly how the two doctors differ with respect to the formal statement *understanding*. By saying that the doctors are dissimilar in their performance of all these actions the subject has formed a systematic relationship between the *telling* and the *understanding*. That relationship meets the systematic perspective-taking criterion (Stage 5a). Note that there is no mention of any of the elements pertaining to consent. None of Subject 2's responses ever relate informing with consent. Therefore, Subject 2's highest stage score is Stage 5a (systematic perspective-taking).

Subject #10

This is an example of a subject who's performance is presystematic. Assessment of all ten doctor pairs derived no evidence of metasystematic performance. In fact, the subject asserted that all the doctors were mostly dissimilar. Such a strong bias toward dissimilarity clearly indicates that the subject had trouble detecting the higher stage equivalence classes. The only correct rejection of course, is doctors Flynn and Drake, the most dissimilar pair (question 1.06). As it turns out this was the only explanation given by the subject that met the systematic perspective-taking criterion. However, in accordance with the GSSS the subject's overall performance is presystematic perspective-taking (Stage 5a, step 3). The subject starts by asserting that Dr. Greys and Dr. (question 1.10) Casey are more dissimilar than similar:

S: "I am going to rate them at a three."
I: "And could you tell me about their similarities and or dissimilarities."
S: "I am going to say that they are similar in the respect that they both believe in a certain type of treatment for this patient. They are trying to get this patient to go ahead and use this treatment. However, um I think that Dr. Casey is dissimilar from Dr. Greys in that Dr. Casey does not give both sides of the issue as effectively as Dr. Greys does. Dr. Casey mentions most patients being cured, I think that would convince any patient to go with it, where as Dr. Greys again encourages the patient to become more involved, to look at the journals. He does say that the treatment is extremely effective, however he does state that there minimal side effects. So he is not giving a completely rosy picture where as Dr. Casey seems to say that everything is going to be o.k."
I: "You Mentioned that one of the two doesn't give both sides?"
S: "It seems that Dr. Casey doesn't give both sides as well as Dr. Greys does."
I: "When you say both sides, what do you mean?"
S: "Oh, pro's and con's of the treatment, whether or not it will be effective or not effective as to whether or not there will be side effects or not. Again there is no, I like percentages, I like to see 50-50 chance or something like that."
I: "Can you think of any other similarities or dissimilarities?"
S: "I want to change the rating. They are more dissimilar than I thought.
I: What would you like to change it to?
S: What did I have it on a three?... how about a one."
I: Why did you decide that they were more dissimilar than you thought?"
S: "Well because I thought I had remembered that Dr. Casey spent more time discussing the alternatives, but he didn't."

Subject 10 starts by asserting that the doctors are similar with respect to how they offer the treatment. That is the abstract proposition, *telling about the treatment*. "I am going to say that they are similar in the respect that they both believe in a certain type of treatment for this patient." The second sentence in the statement articulates the doctors' actions are equivalent: "They [both doctors] are trying to get this patient to go ahead and use this treatment." That being the only point of similarity, the positive assertion is a hit at the abstract stage (Stage 4a).

Then the subject makes a negative assertion (a miss) based on a comparison of a second abstract proposition, *telling about side effects*. "However, um I think that Dr. Casey is dissimilar from Dr. Greys in that Dr. Casey does not give both sides of the issue as effectively as Dr. Greys does. Dr. Casey mentions most patients being cured, I think that would convince any patient to go with it, where as Dr. Greys again encourages the patient to become more involved, to look at the journals." Note that encouraging the patient to look at journals appears to be informative to this subject, however that may not be the case. Many persons have great difficulty understanding written material, especially technical material. Metasystematic perspective-taking requires the subject and the doctor to recognize that possibility. If the subject were coordinating the patient's point of view with the doctors actions she would not conclude that Dr. Greys has done a better job of informing the patient than Dr. Casey. The patients in the vignettes are passive and uncertain individuals who "feeling the doctor knows best prepare for treatment." Therefore, the subject's assertion that Dr. Greys informs is a false alarm.

Furthermore, although the subject has described two abstract propositions (*telling about the treatment* and *telling about side effects*) she has failed to coordinate them. She says that the doctors are similar with respect to the first and dissimilar with respect to the second. That assertion is a formal perspective-taking miss (Stage 4b). According to the GSSS the subject has one abstract stage hit, Stage 4a.

The interviewer probed the subject to determine if there is a metasystematic implication in her statement that Casey does not tell the patient about "both sides of the issue." However, the subject said she was referring to *telling about side effects*. The subject's final decision to rate the pair even more dissimilar only emphasizes that she has missed the formal and postformal signals.

This subject's explanation of the target doctor pair illustrates preformal perspective-taking. Nine of the subject's ten explanations were similar in this way. However, in one explanation the subject did demonstrate higher stage perspective-taking. That will be the last explanation presented here. The subject compares doctors Flynn and Drake, the most dissimilar pair (question 1.07).

S: "I gave them a rating of 1."
I: "Could you tell me why you gave them that rating or how you view them to be similar or dissimilar?"
S: "I view them to be dissimilar in the way that they confront their patients. Dr. Drake personalizes everything he seems to really bring in his own personal experience to tell his patient that this treatment has worked on another [person], and he kind of takes a paternalistic stance. He kind of tells his patient I know what is better, whereas Dr. Flynn says look, you make up your own mind, these are the side effects. He explains every treatment, which I think is a positive thing on that aspect, where as the other Dr. doesn't seem to do that. He (Dr. Flynn) makes sure that the patient understands, and will only go for a treatment if that patient agrees on it. Where as Dr. Drake again really either believes in his treatment or just doesn't believe that his patient knows how to make a decision, and just forces the issue with the patient."
I: "Anything else that you can think of?"
S: "No."

The subject starts with a negative assertion (correct rejection) that the doctors Flynn and Drake are dissimilar "in the way that they confront their patients." The subject first describes the abstract proposition *telling about the treatment*. She says that Dr. Drake "tells his patient that the treatment has worked on another person." Then the subject coordinates that with *telling about side effects*. "Dr. Flynn says look, you make up your own mind, these are the side effects." The subject also says that Dr. Flynn offers options and Dr. Drake does not: "He explains every treatment, which I think is a positive thing on that aspect, where as the other Dr. doesn't seem to do that." Those statements coordinate the *telling about treatment* with the *telling about side effects*. Contrasting the doctors in that way relates all the actions that make up the formal statement *telling*. When the two abstract propositions are coordinated the subject sees the differences between the doctors.

The subject then describes another set of actions: "He (Dr. Flynn) makes sure that the patient understands, and will only go for a treatment if that patient agrees on it. Where as Dr. Drake again really either believes in his treatment or just doesn't believe that his patient knows how to make a decision, and just forces the issue with the patient." That statement coordinates two abstract propositions (*demonstrating the understanding* and *telling about the treatment*), which together comprise the formal statement *understanding*. Note that the subject correctly asserts that Flynn tries to get the patient to understand while Drake does not know if the patient can make a decision. By asserting that the doctors are dissimilar in both the *telling* and the *understanding* the subject has formed a systematic equivalence class the informing system. None of the actions in that system performed by one doctor match the actions in that system performed by the other. Viewing the doctors systematically allows the subject to assert their dissimilarity. This is scored as a systematic response (Stage 5a).

The reader should understand that of the ten vignette comparisons, Drake and Flynn are the most dissimilar doctors. Every action they performed is different from one another. It required that degree of dissimilarity for Subject 10 to give a correct assertion. Subject ten did not detect the two systematic similar pairs nor gave systematic explanations for the other dissimilar pairs. The fact that Subject 10's other responses ranged from preformal to formal indicates the great difficulty she had with the higher stage relationships. All things considered, Subject 10's performance can at best be scored presystematic (Stage 5a, step 3).

Summary

The analysis of the explanations has helped to illustrate how varied social perspectives are perceived by subjects performing at different stages of social perspective-taking. The analysis suggests that subjects performing metasystematic perspective-taking can detect, differentiate and explicate metasystematic differences in complex social relationships such as the doctor patient encounter. Subjects performing systematic perspective-taking can explain some of the complex contingencies in such relationships but not others. The one subject performing presystematic perspective-taking had great difficulty, failing 9 times out of 10 to detect, differentiate, and explicate the metasystematic and systematic relationships.

Table 10 compares both scoring systems' results, the rating system and the dialectical system. The first column on the left shows subjects sensitivity scores. The center column shows the highest complete stage assessed with the dialectical system. The column on the right shows the overall dialectical score.

Table 10
Comparison of sensitivity scores and qualitative scores

	Signal Detection	Explanation Stages	
Sub#	Non-normal *d′* Stage Score	Highest Complete Stage Score	Transitional Performance
Metasystematic Group 1 (*d′* & Fisher Exact test suggest performance is metasystematic)			
3	5b	5b	5b
6	5b	5b	5b
8	5b	5b	5b
11	5b	5a	5a+
13	5b	5b	5b
15	5b	5a	5a+
16	5b	5b	5b
Transitional Group 2 (d' & Fisher Exact test suggest performance is transitional)			
1	5a+	5a	5a+
4	5a+	5a	5a+
7	5a+	5a	5a+
9	5a+	5a	5a
14	5a+	5b	5b
18	5a+	5a	5a+
Systematic Group 3 (d' & Fisher Exact test suggest performance is Systematic)			
12	5a	5a	5a+
2	5a	5a	5a
5	5a	5a	5a+
17	5a	5a	5a+
Presystematic Group 4 (d' & Fisher Exact test suggest performance is presystematic)			
10	4b+	4b	4b+

Note that the qualitative scores supports the metasystematic, and transitional sensitivity scores (*d′*). Subjects whose performance was metasystematic or transitional on the rating system obtained similar scores on the dialectical system. The sensitivity scores appear to slightly underscore performance for subjects in the systematic and presystematic perspective-taking groups. Overall, the correlation between the two scoring systems is .75. The slight underscoring of the systematic subjects (a transitional step or so) may be due to problems in the design of the vignettes. As pointed out in Chapter 3 the consent system is not as well balanced as the informing system. This imperfection is expected to affect systematic performance more than metasystematic performance. The reason is that there are two slightly different consent systems. The systematic question (6) asks subjects to differentiate subjects with respect to consent. The slight difference between the two consent systems challenges the subject's sensitivity to actions that form a consent system and actions that form a systematic stage (the two dimensions). This is especially problematic because subjects performing systematic and presystematic perspective-taking also exhibit greater difficulty ordering the vignettes on the rating scale. Still, overall the scoring difference is very small, a transitional step or so. The two systems are very close.

It is important to remember the exploratory nature of this study. The Doctor-Patient Problem was designed primarily as a metasystematic perspective-taking task. Task design is a process. This study has helped to identify some problems in the current version of the Doctor-Patient Problem, such as the imbalance in the consent system. These problems will be corrected in future versions. The corrections should allow subjects performing systematic and presystematic perspective-taking to make better use of the rating scale. That should produce better alignment between the two scoring systems. Beyond this slight discrepancy the qualitative analysis generally supports the rating analysis.

Appendix E contains five additional sources of support for the metasystematic analysis presented here. In particular, the analyses for subject performance on questions 5 and 6 illustrate how subjects performed on the systematic task. The performance of subjects in the systematic and presystematic groups concur with both the sensitivity and qualitative scores on the metasystematic task (Question 1). Additionally, the analyses for subjects' performance on three "supported tasks" are also presented. The results of those analyses concur with results found in other studies employing supported tasks. They also show that the present measure lends itself to these different testing styles.

Chapter 5
Discussion

The present study offers a number of novel and exploratory findings. The purposes have been manyfold. The first purpose was to design a social perspective-taking stage model that could address many contemporary stage notions. That purpose required finding a systematic basis for many of the newer and older stage models. That basis would have to maintain those stage models' integrity. The resulting model is the Life-span stages of social perspective-taking. That model includes elements from stage models such as the Growth of Interpersonal Understanding, (Selman, 1980), The General Stage Model (Commons & Richards, 1984), Perspective-taking Stages of Moral-Justice Reasoning (Kohlberg, 1984), and Skill Theory (Fisher, 1980).

The second purpose was to justify the higher stage notions, and to insure that arbitrary stages were not inserted or left out in the sequence of social-perspective-taking. To accomplish those purposes, this thesis presents a logical and mathematical bases for social perspective-taking stages. Each stage was built through a coordination of the preceding stage actions, as proposed by Piaget (1972), Selman (1980), Kohlberg and Armon (1984), and Commons and Richards (1984a).

A third purpose was to use that model to design a task that addresses many of today's concerns with task analyses and single-subject design task construction. As in psychophysics, the task allows for assessment using "objective response" data such as ratings, as opposed to "explanation" data such as in the Moral Judgment Interview (Colby & Kohlberg, 1987). It also allows assessment of "preference" data (Rest, 1980), and "supported-condition" data (Vygotsky, 1972; Fischer, 1980).

A forth purpose was to make possible an assessment of these various instrument types (unsupported, supported, and preference tasks), by adapting analytical techniques from signal detection theory (Rosenthal & Rubin, 1989; Overall, 1980; Swets & Green, 1964), and decision theory (Jameson, 1970; Lee, 1971; Luce, 1959). An examination of the subjects' decision rules helped to explain why subjects made the choices they did.

Major results found here support the Doctor-Patient Problem as an instrument that can detect metasystematic (Stage 5b) perspective-taking, transitional performance, and systematic performance (Stage 5a). The Doctor-Patient Problem also provides information about the kinds of difficulties subjects have differentiating vignettes that represent different stages of social perspective-taking. These were the research questions.

Validity

Two main methods of supporting the signal detection scoring system were employed. The first method was to assess subjects' decision rules. The information embedded the in vignettes was converted to variable intensities of informed-consent and perspective-taking stages. The different variables were then correlated with subjects' choice responses to determine if the constructs in the vignettes explained subject rating decisions. Beyond the face validity of the way the vignettes were constructed and the questions asked, the decision analysis showed increased use of information as stage of performance increased. Although these results do not have very much power they support the scoring system.

A second method of supporting the scoring system was a qualitative analysis of subjects' explanations of their responses. The explanations were scored using techniques from the General Stage Scoring System (Commons, et al, 1984, 1990, in preparation). The qualitative analysis generally supports the signal detection scoring system. A slight tendency for the rating system to underscore the subjects performing systematic and presystematic perspective-taking will be corrected in future versions of the Doctor-Patient Problem. Several steps will be taken to strengthen the signal detection scheme. One, the number of protocols will be increased from ten to 15 vignette pairs. Two, at least two target vignette pairs will represent each stage. These alterations will increase the statistical power, of the signal detection scoring scheme and decision analysis. Three, the current imbalance found in the representation of informed-consent will be corrected. These corrections should improve assessment of subject choice responses, resulting in better alignment between choice performance and qualitative performance for subjects performing systematic and presystematic perspective-taking.

A third source may be used in support of subject performance on the metasystematic task. Subject performance was also assessed on five alternative perspective-taking tasks. Those tasks were also assessed using signal detection analysis and decision analysis. All the questions were designed to either test for the metasystematic, or systematic perspective-taking stages. Each task also represented alternative testing styles currently popular in developmental research, "supported tasks (Fischer, 1980), and preference tasks (Rest, 1980). Subject performance on these tasks also suggest a general tendency for subjects to use more of the information embedded in the vignettes as stage increases.

Comparisons with other studies of post-undergraduates

The results here are also in line with other studies when three factors are taken into consideration, such as Byrne's (1973) work in logical-reasoning, justice-reasoning, and role-taking. The proportion of metasystematic reasoning graduate or professional-school-educated subjects was 7/18 = .38, which was higher than in the other studies (Armon, 1984; Commons & Richards, 1984; Richards, 1990; Demetriou, 1984; Kohlberg, 1984; Powell, 1984). A first factor is the highly selective nature of subject recruitment, subjects were older in this study and had high level education. A second factor that would account for

the higher proportion of subjects scoring at the metasystematic stage is that the test is in a very familiar subject area (making agreements or giving permission). In studies of formal operations (e.g. Lam & Sonnert, June, 1988 among others), one stage differences have been found for unfamiliar material (swing pendulums) versus familiar material (painting wood, cleaning cloths, growing plants).

Without varying the content of the problem, and scoring the explanation, these two suggestions are offered as speculation. However, data will be forthcoming because the scoring is underway and other sets of data are being collected (Stevens-Long & Commons, in preparation).

Three questions increased the level of support: the supported informed-consent, preference, and supported-preference questions. Almost all the subjects scored perfectly on these questions. This would suggest that such methods overrate the stage of performance because life usually does not come in supported form. Also, no other study finds so many metasystematic performing subjects using unsupported questions. Whereas support may be useful in obtaining the maximum (or "optimal") performance, life in general does not provide such support.

Limitations on the current version of the Doctor-Patient Problem.

Some problems were discovered with the "supported" Stage 5a questions 5 and 6. For example, it was proposed that subjects who solved the "support condition" (Question 4) of the metasystematic task could also solve the "support condition" of the systematic task. Overall performance shows that a number of subjects who solved the metasystematic task did not obtain equally high *d'* values on the proposed systematic questions. Some of these subjects expressed their disagreement with a systematic interpretation of informed-consent. They insisted that informed cannot be separated from consent, which is a correct metasystematic rejection of the systematic interpretation. Another factor is the fact that there was an imbalance between different vignettes representing consent. One abstract proposition differed between the two representations. Although that would not necessarily pose much problem for metasystematic task performance, it would pose a problem when subjects where forced to respond just to consent.

Ways to improve the problem

The following suggestions are set as ideal conditions for future versions of the Doctor-Patient Problem and other perspective-taking tasks. The problem with the systematic tasks appears to lie in the phrasing of the questions. In their present form questions 5 and 6 ask subjects to "rate whether the doctors informed," and "rate whether the doctors obtained consent," respectively. That phrasing places conflicting demands on subjects with a metasystematic interpretation of informed-consent. Subjects are forced to reject their higher order logical and psychological orientation to the issue. Their inability to do that results in guesses or reject the questions. Questions 5 and 6 will be worded to allow subjects to maintain their metasystematic decision rules, and solve the systematic aspect of the *Doctor-Patient Problem* as well.

For example, Question 5 may be reworded as follows: Rate the degree of the doctors' efforts to inform their patient even if they did not attempt to obtain consent. Question 6 would ask: Rate the degree of the doctors' efforts to get consent, even if they did not inform the patient. Phrasing the questions this way should allow subjects to identify how much informing or attempting to get consent the doctors engaged in. These questions would not place conflicting demands on subjects with a metasystematic interpretation of informed-consent.

The second problem is that the consent system needs fine tuning. One vignette, that represents consent, Dr. Flynn contains one abstract proposition that differs from those of other doctors who perform consent. That means two slightly different consent systems exist. Note that with respective to the stage dimension both versions of consent represent the same stage (5a). However, with respect to the informed-consent dimension they are slightly dissimilar. That dichotomy may confuse subjects and affect how they rate these vignettes, perhaps causing them to obtain misses or false alarms. Correcting that abstract proposition should improve subjects ratings on the systematic question.

Third, the number of possible hits on the metasystematic question will be increased from one to two. This will be accomplished by making two doctors who obtain informed-consent in exactly the same way. That pair will be contrasted with the existing pair who fail to perform informed-consent in exactly the same way. The second pair will be the inverse of the first, thus completing the INRC relationship. This should not increase the difficulty of the metasystematic task for subjects who perform metasystematic perspective-taking because both pairs are hierarchically equivalent.

Fourth, more doctor comparisons (up to 15 pairs) will be included. The fifteen vignettes together with the increased criterion of detecting two vignettes instead of just one will increase the power of the statistical and descriptive analyses.

Fifth, to decrease task length, a number of questions will be dropped. Little variability was found to the "supported" question (4) of informed-consent. The plan is to examine if there is variability in the explanation data of that question. If there is little, that question could be dropped. Likewise the preference questions may also be relatively uninformative.

The exploratory nature of this study coupled with task length, budget and piloting limitations have restricted the present effort. Ideally, I had hoped to generate pairs of vignettes for every stage. Subject could then compare these signals and classify them as similar or dissimilar. However, the vignettes in the current version of the Doctor-Patient Problem do not

represent *all* the stages. They only represent abstract (Stage 4a) through metasystematic (Stage 5b) perspectives. It would have also been nice to represent a positive and a negative version of informed-consent for each stage, but that was not possible either.

It is not clear how practical it is to accommodate all the ideal testing conditions. After all, how many vignette comparisons can subjects assess before they become fatigued? Clearly, these ideas have to be piloted.

Unanswered Questions

The difference in sensitivity of this instrument versus the ones of Commons, Richards, and Kuhn (1982) needs to be explored. My conjecture is that people are more familiar with informed-consent than with ordering of non-linear preference. The relation between stage as obtained with ratings versus that obtained with explanations. Because the instrument can be administered in written form without extracting qualitative data, as the analysis of the ratings has shown, variations in test administration might be examined. Other versions of informed-consent, such as teacher-student, therapist-client, wife-husband, gangleader-gangmember, candidate-voter, etc., could be explored. Minor changes to the doctor-patient vignettes would result in these other forms. Who are the people who are most sensitive? Are they people who are securely attached (Shaver, 1987) or insecurely attached? Do people perform differently across such task even if the form is maintained constant? Also, a lower stage version of the Doctor-Patient Problem is in progress. Ideally, alternate vignettes, lower in readability and complexity should allow lower stage assessment.

Implications for other areas in psychology and education

The mathematical theory of social-perspective taking presented here provides a basis for understanding social behavior in a wide variety of arenas. It allows for a systematic analysis of the development of judgements of the good, the moral, the beneficent. For example developmental notions of the good, include what is valued in relationships and in the self (Armon, 1989; Kegan, 1982; Selman, et al on friendship). The systematization of social perspective-taking allows one to answer questions about the correctness and completeness of virtually all proposed stage sequences in all of these domains and subdomains. This is a strong claim but one that the logic of the general stage model supports (Commons, Richards, & Trudeau, in preparation).

For example, the social perspective-taking theory presented here shows that Kohlberg's intermediate steps (i.e. 2/3, 3/4) are true stages, except for step 4/5. Stage 3/4 was the formal stage, stage 4 the first postformal stage and stage 5 the second postformal stage. Alexander (1990, personal communication) used the Commons, Armon and Richards (1984) comparison of developmental theories in generating the Alexander and Langer (1990) table comparing theories. The Commons, Richards and Armon table was based on the general stage model, which is used as one of the basis of the present social-perspective-taking theory. The Alexander table lines up the higher stages of Case, Commons, Fischer, Gilligan, Kegan, Kohlberg, Pascual-Leone, and Selman. All of these authors in the Alexander and Langer book accepted the correspondence.

As a consequence of placing the ordering of development in the tasks first and then in the performance of those tasks, the circularity of stage theory is avoided. The vignette format used here has real power. It allows for multiple secondary measures such as preference questions, comparisons, supporting directed questions, etc. The number of secondary questions allowed for a comparison of traditional methods by holding the stimulus material constant. Contrast this with the traditionally developmental tasks that have taken the form of lengthy interviews.

The ultimate goal of this work is to obtain a task design that will allow subjects to assess a complex problem, give quick choice responses, and provide analytical power. The present task design offers a relatively fast interview, about 45 minutes without verbal explanations. Analysis of subject responses is non-arbitrary, and statistically sound (provided the number of trials is large enough).

Another important point of the present work is that not only does the proposed theory inform about stages, but really reframes the whole issue of stage of performance, and stage theory--where stages can be determined a priori. There is no guessing about the stage of a subject's performance with this method. The experimenter knows exactly how the subject should respond to the items presented.

Appendices

Appendix A

A Brief Description of Higher Stages of Perfective-taking

At ***Stage 3a (2)*** *early concrete (primary) social-perspective taking*, the individual recognizes that the self and specific others each have a point of view (relativistic), each with different specific interests (Concrete Operations). Because individuals are operating concretely, they only reflect on specific actions that are observable. The individual does not reflect on another's intentions, but simply observes the other's behavior. The behavior is thought to reveal the other's intentions. The intention of the self, however, is not coordinated with the intentions of others. One's behavior is oriented toward a concrete goal.

At ***Stage 3b (2/3)*** *concrete social-perspective taking*, the individual coordinates the two stage 3a actions. This new operation allows the individual to reflect on how a specific behavior initiated by the self produces a consequent behavior in another specific person. Two individuals interacting at Stage 3b (2/3) perspective-taking do so in isolated reciprocity. Each interested only in a self generated outcome. Note that, not only does the self generate the outcome, the reflection is on specific concrete actions (a specific behavior leading to a specific outcome).

Stage 4a (3) *abstract social-perspective taking*, is marked by "stepping outside of one's self" and reflecting on the different points of view in a social interaction (Abstract Operations). This means the individual is able to generate abstract notions about how the self and others effect each other. Rather than reflecting on specific actions, as in stages 3a and 3b, the individual now observes that others' behavior causes changes in one's own behavior. Any person, in a given situation, can affect another's behavior. The situation is observable from an outside point of view. The individual believes in a neutral third party perspective.

At ***Stage 4b (3/4)*** *formal social-perspective taking*, the individual no longer makes generalizations about social interactions as in Stage 4a. Rather, given a social situation containing an array of events, the individual reflects on the cause and effect of the participants' behavior. The individual isolates causal links

Appendix A Continued

between events and outcomes. Given a sequence of events in a social episode, the individual detects specific antecedent actions that cause specific outcomes. Formal perspective-taking requires one to see the causes of each action in a group of seemingly random actions, in a given social episode.

At ***Stage 5a (4)*** *systematic social-perspective taking*, individuals organize a social-system perspective. This perspective views persons in light of their place in the social system. Because Stage 5a is the first post-formal stage, individuals reflect on the logical connections between all the different events in a social episode. Through systematic iteration of the Stage 4b action (causal linking), the systems perspective explains the connections between all of its components logically. Subjects conclude that behavior results
from a complex network of interactions. However, the limitation to Stage 5a perspective-taking is that an individual forms a unique interpretation of a situation. That interpretation is contingent the individual's particular frame of reference. The individual disregards alternative interpretations.

At ***Stage 5b (5)*** *metasystematic social-perspective taking*, one recognizes that each Stage 5a system of interpretation is subjective in the sense that it depends upon the framework and orientation of the observer. In social conflict, for example, a metasystematic view recognizes how the properties of the systems generate different perspectives. Hence, one observes the different ways in which a given situation may be interpreted. By observing the causal networks of each perspective at the systematic level, the individual is able to describe how those interpretations are similar or different.

Note that for the purpose of this study, stages prior to the concrete stage are not presented.

Adapted, in part, from Kohlberg (1984), Commons & Rodriguez (1990), Rodriguez (1989) and Selman (1980).

Appendix B **The vignettes**

The following seven stories are set in another country. Each story is about a different doctor at a hospital there. Each doctor has a patient with a similar illness. The doctors arrive at their choice of treatment in different ways. All the doctors provide the same treatment for their patients. In every case, the patient worsens and suffers side effects of the treatment. During a general review of these bad results, each doctor's ***method*** was looked at. Below are the seven doctors' accounts of their methods. Read all seven accounts carefully and then answer the questions that follow.

DOCTORS' METHODS

Doctor **Adams** offers a treatment the hospital has studied and prefers. The doctor says the treatment is picked by well known doctors. The doctor describes different treatment options and their side effects. The patient is asked to explain these things back to the doctor. The doctor says that experts found other treatments to have less favorable results. The patient is asked to prepare for treatment. The patient thinks about what the doctor has said. Feeling the doctor knows best, the patient prepares for the treatment.

Doctor **Brown** offers a treatment preferred by fellow doctors. The doctor says that other doctors who are friends use this treatment. A fellow doctor is called in to tell the patient again about the treatment. The doctor asks if the patient would like to hear a third doctor explain the treatment. The patient is told these doctors had good results with that treatment. The doctor instructs the patient to take the treatment. The patient thinks about what the doctor has said. Feeling the doctor knows best, the patient prepares for the treatment.

Doctor **Casey** offers a treatment highly accepted by the clinical community. The patient is told that the treatment cures most patients. The doctor describes how the treatment has helped patients. The doctor then repeats everything to the patient. The doctor says the suggested treatment is noted for its good results. The patient is asked to decide if the treatment will be taken. The patient thinks about what the doctor has said. Feeling the doctor knows best, the patient prepares for the treatment.

Doctor **Drake** offers a treatment based on personal experience. The patient is told that the treatment has worked before on another patient. The doctor describes what the treatment did for the patient that other time. The doctor asks if there is anything about the description the patient did not understand. The patient is told the doctor highly recommends the treatment. The doctor urges the patient to take the treatment. The patient thinks about what he doctor has said. Feeling the doctor knows best, the patient prepares for the treatment.

Doctor **Evans** offers a treatment that works well compared to other treatments. The patient is told the doctor has done a careful comparison of different treatments. The patient is told what the treatment does and what its side effects are. The doctor explains in detail what the treatment is expected to do. The doctor says that other treatments are less effective. The patient is told the doctor is prepared to start the treatment. The patient thinks about what the doctor has said. Feeling the doctor knows best, the patient prepares for the treatment.

Doctor **Flynn** offers a treatment along with others treatments in medicine. The doctor says that all treatments, including the one suggested, have side effects. The doctor explains all the effects of every treatment. The doctor asks the patient to relate back the explanation. The doctor says only a treatment that the patient agrees to will be given. The doctor asks if the patient accepts the suggested treatment. The patient thinks about what the doctor has said. Feeling the doctor knows best, the patient prepares for the treatment.

Doctor **Greys** offers a treatment that medical journals report tested well over others. The patient is told that discovery of the treatment resulted in a Nobel Prize. The doctor shows the patient a journal that describes the treatment. The doctor says the treatment is the most promising and points out it success rate. The patient is shown other journals that review the treatment. The doctor asks if the patient would like to try the treatment. The patient thinks about what the doctor has said. Feeling the doctor knows best, the patient prepares for the treatment.

Appendix B, continued

The Questions (Doctor-Patient Problem)

1. Note that every doctor offers a treatment. The patient, then, feeling the doctor knows best, prepares for the treatment. Given this, please rate and explain how the doctors' ***views, as reflected in their methods***, are similar or dissimilar. A rate of 0 means the doctors' views are most dissimilar. A rate of 7 means the doctors' views are most similar. You may use the same rating for more than one doctor pair. In your explanations, do not simply repeat the doctors' statements, but also explain the doctors' views.

		RATINGS							
		Most Dissimilar							Most Similar
1.1a	Dr. Adams & Dr. Casey	0	1	2	3	4	5	6	7
1.1b	In what ways do you find Dr. Adams's **view** to be similar or dissimilar to Dr. Casey's **view**?								
1.2a	Dr. Adams & Dr. Drake	0	1	2	3	4	5	6	7
1.2b	In what ways do you find Dr. Adams's **view** to be similar or dissimilar to Dr. Drake's **view**?								
1.3a	Dr. Casey & Dr. Drake	0	1	2	3	4	5	6	7
1.3b	In what ways do you find Dr. Casey's **view** to be similar or dissimilar to Dr. Drakes's **view**?								
1.4a	Dr. Casey & Dr. Flynn	0	1	2	3	4	5	6	7
1.4b	In what ways do you find Dr. Casey's **view** to be similar or dissimilar to Dr. Flynn's **view**?								
1.5a	Dr. Drake & Dr. Flynn	0	1	2	3	4	5	6	7
1.5b	In what ways do you find Dr. Drakes's **view** to be similar or dissimilar to Dr. Flynn's **view**?								
1.6a	Drake & Dr. Greys	0	1	2	3	4	5	6	7
1.6b	In what ways do you find Dr. Drake's **view** to be similar or dissimilar to Dr. Grey's **view**?								
1.7a	Dr. Flynn & Dr. Adams	0	1	2	3	4	5	6	7
1.7b	In what ways do you find Dr. Flynn's **view** to be similar or dissimilar to Dr. Adams's **view**?								
1.8a	Dr. Flynn & Dr. Greys	0	1	2	3	4	5	6	7
1.8b	In what ways do you find Dr. Flynn's **view** to be similar or dissimilar to Dr. Greys's **view**?								
1.9a	Dr. Greys & Dr. Adams	0	1	2	3	4	5	6	7
1.9b	In what ways do you find Dr. Greys's **view** to be similar or dissimilar to Dr. adams's **view**?								
1.10a	Dr. Greys & Dr. Casey	0	1	2	3	4	5	6	7
1.10b	In what ways do you find Dr. Greys's **view** to be similar or dissimilar to Dr. Casey's **view**?								

Appendix B continued

2a. Rate the degree to which the doctors attained informed-consent from their patients.

		RATINGS							
		No Informed Consent							Yes Informed Consent
2.1a	Dr. Adams	0	1	2	3	4	5	6	7

2.1b Why did you rate doctor Adams as you did? Explain as fully as you can.

2.2a	Dr. Brown	0	1	2	3	4	5	6	7

2.2b Why did you rate doctor Brown as you did? Explain as fully as you can.

2.3a	Dr. Casey	0	1	2	3	4	5	6	7

2.3b Why did you rate doctor Casey as you did? Explain as fully as you can.

2.4a	Dr. Drake	0	1	2	3	4	5	6	7

2.4b Why did you rate doctor Drake as you did? Explain as fully as you can.

2.5a	Dr. Evans	0	1	2	3	4	5	6	7

2.5b Why did you rate doctor Evans as you did? Explain as fully as you can.

2.6a	Dr. Flynn	0	1	2	3	4	5	6	7

2.6b Why did you rate doctor Flynn as you did? Explain as fully as you can.

2.7a	Dr. Greys	0	1	2	3	4	5	6	7

2.7b Why did you rate doctor Greys as you did? Explain as fully as you can.

Appendix B continued

3. Rate whether or not the doctors informed their patients.

RATINGS

Not Informed — Informed

3.1a Dr. Adams 0 1 2 3 4 5 6 7
3.1b Why did you rate doctor Adams as you did? Explain as fully as you can.

3.2a Dr. Brown 0 1 2 3 4 5 6 7
3.2b Why did you rate doctor Brown as you did? Explain as fully as you can.

3.3a Dr. Casey 0 1 2 3 4 5 6 7
3.3b Why did you rate doctor Casey as you did? Explain as fully as you can.

3.4a Dr. Drake 0 1 2 3 4 5 6 7
3.4b Why did you rate doctor Drake as you did? Explain as fully as you can.

3.5a Dr. Evans 0 1 2 3 4 5 6 7
3.5b Why did you rate doctor Evans as you did? Explain as fully as you can.

3.6a Dr. Flynn 0 1 2 3 4 5 6 7
3.6b Why did you rate doctor Flynn as you did? Explain as fully as you can.

3.7a Dr. Greys 0 1 2 3 4 5 6 7
3.7b Why did you rate doctor Greys as you did? Explain as fully as you can.

Appendix B continued

4. Rate whether or not the doctors attained consent from the patient.

RATINGS

No Consent Consent

4.1a Dr. Adams 0 1 2 3 4 5 6 7
4.1b Why did you rate doctor Adams as you did? Explain as fully as you can.

4.2a Dr. Brown 0 1 2 3 4 5 6 7
4.2b Why did you rate doctor Brown as you did? Explain as fully as you can.

4.3a Dr. Casey 0 1 2 3 4 5 6 7
4.3b Why did you rate doctor Casey as you did? Explain as fully as you can.

4.4a Dr. Drake 0 1 2 3 4 5 6 7
4.4b Why did you rate doctor Drake as you did? Explain as fully as you can.

4.5a Dr. Evans 0 1 2 3 4 5 6 7
4.5b Why did you rate doctor Evans as you did? Explain as fully as you can.

4.6a Dr. Flynn 0 1 2 3 4 5 6 7
4.6b Why did you rate doctor Flynn as you did? Explain as fully as you can.

4.7a Dr. Greys 0 1 2 3 4 5 6 7
4.7b Why did you rate doctor Greys as you did? Explain as fully as you can.

Appendix B continued

Probes

For clarification purposes, after each explanation, subjects may be asked the following questions:

1. Are there any other reasons for rating the doctors as you did?
2. When you said "..." what exactly did you mean by that?
3. Why is "..." important?
4. Now that you had time to think about the doctors, would you like to go back an change any of the ratings? Why is that a better rating? What made you change your mind?

If appropriate:

5. I noticed that you did not rate any of the doctors higher than a rating of __, why is that?
6. I noticed that you did not rate any of the doctors lower than a rating of __, why is that?
7. I noticed that you rated all the doctors close together, why is that?
8. I noticed that you rated all the doctors fairly spread apart, why is that?
9. I noticed that you rated all the doctors only at the extremes, why is that?

Appendix C
Informed-Consent and equivalence classes

Ideally, subjects should be able to "identify" vignettes that represent different perspective-taking stages. In the Doctor-Patient Problem informed-consent is the agent that represents the different stages. Obtaining informed-consent requires a doctor to perform a metasystem of actions. That metasystem of actions forms an equivalence class. Identifying that equivalence class in turn demonstrates metasystematic perspective-taking (Stage 5b). Subjects must identify the metasystematic equivalence class.

The informed-consent metasystem of actions is comprised of subsets of actions that form lower order equivalence classes, systems, formal statements, and abstract propositions. For example, some doctors perform a set of actions that only represent "informing" the patient. That subset of informed-consent forms a systematic equivalence class of actions, Stage 5a. That system of actions is comprised of subsets of actions representing lower order equivalence classes, and those subsets are comprised of even smaller subsets, etc.. The following descriptive examples and Tables help to illustrate the different equivalence classes of actions performed by the doctors in the Doctor-Patient Problem. All the equivalence classes are described to show that the vignettes are internally consistent, and to illustrate what subjects are expected to do in the task.

Informing

We start with the informing system. The formal operational statements that make up *informing*, I, are: The formal operational act of *telling*, T, and the formal operational act of checking for *understanding*, U. We assume that the Doctor carries out all these propositions. The formal statement of *telling*, T, consists of the abstract propositions: Telling about treatment, T_x and Telling about side effects, E_x

(x) = different treatments
T_x = x is a treatment the Doctor describes (x = treatment 1, treatment 2 for example)
T_1 = treatment 1 could be offered by the doctor
T_2 = treatment 2 could be "not doing treatment 1"
E_x = x has side effects
$A_{x,y}$ = x or y are different treatment options that the Doctor describes

We presume that x = 1 is the good treatment that produces the good outcomes; and that $x \neq 1$ are the treatments that produce worse outcomes. Note that in T_x, if x only has a single value, especially for treatment, then alternatives have not been presented. Hence $A_{x,y} = T_x, T_y$. Equivalence classification would take this form $(x)(T_x \dashrightarrow E_x)$. Table 1 shows the specific descriptions (abstract propositions) in the vignettes that make up the formal statement "telling."

Table 1
The Formal Statement "Telling"

Telling consists of two abstract propositions, T_x, for treatment offered, and E_x, for describing side effects.

Telling about treatment

$\mathbf{T}_{\text{Doctor's treatment}}$ = Doctor offers a treatment [treatment 1]

$T_{\text{Adams's}}$ = "offers a treatment the hospital has studied and prefers."
$T_{\text{Brown's}}$ = "offers a treatment preferred by fellow doctors."
$T_{\text{Casey's}}$ = "offers a treatment the clinical establishment considers most effective."
$T_{\text{Drake's}}$ = "offers a treatment based on personal experience."
$T_{\text{Evans's}}$ = "offers a treatment that works well compared to other treatments."
$T_{\text{Flynn's}}$ = "offers a treatment along with other treatments available in medicine."
$T_{\text{Greys's}}$ = "offers a treatment that medical journals report tested well over others."

Telling about side effects

$\mathbf{E}_{\text{x = 1,2,3..}}$ **= Doctor describes the alternative treatments and side effects.**

$\mathbf{E}_{\text{Doctor's treatment alternatives x = 1,2,3..}}$ **= Doctor describes the alternative treatments and side effects.**

$E_{\text{Adams's}}$ = "The doctor describes different treatment options and their side effects."
$E_{\text{Brown's}}$ = "A fellow doctor is called in to tell the patient again about the treatment."
$E_{\text{Casey's}}$ = "The doctor describes how the treatment has helped patients."
$E_{\text{Drake's}}$ = "The doctor describes what the treatment did for the patient that other time."
$E_{\text{Evans's}}$ = "The patient is told what the treatment does and what its side effects are."
$E_{\text{Flynn's}}$ = "The doctor explains all of the effects of every treatment."
$E_{\text{Greys's}}$ = "The doctor shows the patient a journal that describes the treatment."

The formal statement *understanding*, U, consists of two abstract propositions: Telling about side effects, E_x and Demonstrating understanding, U_x, by asking the patient to relate back the effects of alternatives.

(x) = different treatments
U_x = the Doctor asks the Patient to describe treatment x
x = treatment 1, treatment 2 for example:
U_1 = the Doctor asks the Patient to describe treatment 1
U_2 = the Doctor asks the Patient to describe treatment 2
$-U_x$ the Doctor does not ask the Patient to describe treatment x
E_x = the Doctor describes the effects of treatment x
$A_{x,y}$ = x or y are different treatment options that the Doctor asks the Patient to describe

Table 2 shows the specific abstract propositions in the vignettes that underlie the formal statement "understanding."

Table 2
The Formal Statement "Understanding"

Understanding consists of two abstract propositions, E_x, for telling about side effects, and U_x, demonstrating understanding.

Specific "understanding" abstract propositions in the vignettes.

Telling about side effects

$E_{x = 1,2,3..}$* = Doctor describes the alternative treatments and side effects.

$E_{\text{Doctor's treatment alternatives } x = 1,2,3..}$ = Doctor describes the alternative treatments and side effects.

$E_{Adams's}$ = "The doctor describes different treatment options and their side effects."
$E_{Brown's}$ = "A fellow doctor is called in to tell the patient again about the treatment."
$E_{Casey's}$ = "The doctor describes how the treatment has helped patients."
$E_{Drake's}$ = "The doctor describes what the treatment did for the patient that other time."
$E_{Evans's}$ = "The patient is told what the treatment does and what its side effects are."
$E_{Flynn's}$ = "The doctor explains all of the effects of every treatment."
$E_{Greys's}$ = "The doctor shows the patient a journal that describes the treatment."

Demonstration of Understanding

U_{Doctor} = The doctor asks patient to demonstrate understanding of treatments and sided effects.

U_{Adams} = "The patient is asked to explain these things back to the doctor."
U_{Brown} = "The doctor asks if the patient would like to hear a third doctor explain the treatment."
U_{Casey} = "The doctor then repeats everything to the patient."
U_{Drake} = "The doctor asks if there is anything about the description the patient did not understand."
U_{Evans} = "The doctor explains in detail what the treatment is expected to do."
U_{Flynn} = "The doctor asks the patient to relate back the explanation."
U_{Greys} = "The doctor shows the patient a journal that describes the treatment. "

* Note that the abstract proposition E_x is also coordinated in the formal statement "telling."

Consent

Similar to informing, two formal operational statements make up the system *consent*, C: The formal operational act of *obtaining the patient's agreement*, O, and the formal operational act of having the patient *prepare for the treatment*, P. Obtaining the patient's agreement: consists of two abstract propositions. There are three abstract propositions that may be coordinated to form the formal statements: 1) The doctor indicates, or infers that the offered treatment is a suggestion, or recommendation, R. 2) The doctor makes a treatment comparison, H. The doctor leaves the decision up to the patient, L.

Obtaining the patient's agreement, O:

(x) = x are different treatments to be administered
R_x = the Doctor infers that treatment x is a suggestion, or recommendation
R_1 = the Doctor asks the patient to decide about treatment
R_2 = the doctor says something to encourage patient to take the suggested treatments
H_x = the doctor makes a treatment comparison, H.
H_1 = the doctor refers to the different treatments options.
L_x = the Doctor asks for the Patient's agreement to have treatment x administered.
L_1 = the Doctor lets the patient decide about treatment.
$A_{x,y}$ = x or y are different treatments that the Doctor administers if the Patient agrees.

Table 3 shows the specific abstract propositions in the vignettes that underlie the formal statement "obtaining the agreement."

Table 3
The formal statement "Obtaining Patient's Agreement"

Obtaining Patient's Agreement consists of two abstract propositions.
Two of the following abstract propositions may be coordinated to form the formal statement:
The doctor indicates, or infers that the offered treatment is a suggestion, or recommendation, R.
The doctor makes a treatment comparison, H.
The doctor leaves the decision up to the patient, L.
Specific "obtaining agreement" abstract propositions in the vignettes.
The doctor infers that the offered treatment is a suggestion, or recommendation, R.
R_{Adams} = "The doctor says that experts found other treatments to have less favorable results."
$-R_{Brown}$ = "The patient is told these doctors had good results with that treatment."
R_{Casey} = "The patient is asked to decide if the treatment will be taken."
R_{Drake} = "The patient is told the doctor highly recommends the treatment."
R_{Evans} = "The doctor says that other treatments are less effective."
R_{Flynn} = "The doctor asks if the patient accepts the suggested treatment."
R_{Greys} = "The doctor asks if the patient would like to try the treatment."
The doctor makes a treatment comparison, H.
H_{Doctor} = The doctor makes a treatment comparison, H.
H_{Adams} = "The doctor says that experts found other treatments to have less favorable results."
$-H_{Brown}$ = "The patient is told these doctors had good results with that treatment."
$\pm H_{Casey}$ = "The doctor says the suggested treatment is noted for its good results."
$-H_{Drake}$ = "The patient is told the doctor highly recommends the treatment."
H_{Evans} = "The doctor says that other treatments are less effective."
H_{Flynn} = "The doctor says only a treatment that the patient agrees to will be given."
$-H_{Greys}$ = "The patient is shown other journals that review the treatment."

Table 3, continued
The doctor leaves the decision up to the patient, L.
L_{Doctor} = The doctor asks for agreement to the suggested treatment.
L_{Adams} = "The patient is asked to prepare for treatment."
$-L_{Brown}$ = "The doctor instructs the patient to take the treatment."
L_{Casey} = "The patient is asked to decide if the treatment will be taken."
$*L_{Drake}$ = "The doctor urges the patient to take the treatment."
$*L_{Evans}$ = "The patient is told the doctor is prepared to start the treatment."
L_{Flynn} = "The doctor asks if the patient accepts the suggested treatment."
L_{Greys} = "The doctor asks if the patient would like to try the treatment."

± This proposition can infer either that a comparison is being made or that it is not, depending the other abstract propositions that it is coordinated with.
* Urging and preparing for treatment are negative instances of letting the patient decide relative to deciding if treatment will be taken etc. With respect to instructing the patient to take the treatment they are positive.

The formal operational act of having the patient *prepare for the treatment*, P, consists of two abstract propositions: Engaging in the judgement process, J_x, and Agreeing to the treatment by preparing, P_x
(x) = different treatments to be administered
J_x = x is a treatment the Patient feels good about
x = treatment 1, treatment 2, etc.
J_1 = the Patient feels the doctor knows best
$-J_1$ = the Patient feels another treatment is best "not doing treatment 1"
P_x = a treatment for which the patient prepares
P_1 = the Patient prepares for treatment x
$-P_1$ = the Patient does not prepare for treatment x

Table 4 shows the specific abstract propositions in the vignettes that underlie the formal statement "Preparing for treatment."

Table 4
The formal statement "Preparing for the treatment"

Preparing for the treatment consists two abstract propositions, engaging in the judgement process, J_x, and agreeing to the treatment by preparing, P_x.
Specific "judgement" abstract propositions in the vignettes.
Engaging in the judgement process, J_x, feeling the doctor knows best

$\mathbf{J_{doctor}}$	=	**Engages in the judgement**
J_{Adams}	=	"Feeling the doctor knows best"
J_{Brown}	=	"Feeling the doctor knows best"
J_{Casey}	=	"Feeling the doctor knows best"
J_{Drake}	=	"Feeling the doctor knows best"
J_{Evans}	=	"Feeling the doctor knows best"
J_{Flynn}	=	"Feeling the doctor knows best"
J_{Greys}	=	"Feeling the doctor knows best"

Specific "preparing" abstract propositions in the vignettes.
***Agreeing to the treatment by preparing*, $\mathbf{P_x}$**

$\mathbf{P_{doctor}}$	=	**Prepares for treatment**
P_{Adams}	=	"the patient prepares for the treatment."
P_{Brown}	=	"the patient prepares for the treatment."
P_{Casey}	=	"the patient prepares for the treatment."
P_{Drake}	=	"the patient prepares for the treatment."
P_{Evans}	=	"the patient prepares for the treatment."
P_{Flynn}	=	"the patient prepares for the treatment."
P_{Greys}	=	"the patient prepares for the treatment."

The Hierarchical Equivalence Classes

The following sections illustrate the hierarchical equivalence classes that comprise the stages of informed-consent. Each higher stage equivalence class organizes specific groups of statements that formed the previous stage class.

Formal Operational Equivalence Classes

To identify a formal equivalence class, the subject has to detect two abstract propositions in the vignettes that are similar and relate them. For example, in one abstract proposition (T_x): "The doctor tells the patient about treatment options." In another abstract proposition (E_x): "The doctor tells the patient about side effects." Together these two propositions form a statement, F_1, that "tells" the patient about the treatment. *Telling* the patient about the treatment is the new equivalence class, a formal element. Logicians call this a statement.

At the formal operational order of hierarchical complexity, for this task, the relations among these abstract order propositions may be roughly formalized as an implicative sequence. For what the subject perceives, "implicative" is used here in the psychological sense not in the logical or physical sense. For the "*telling*" variable, *if* there is a treatment *then* it has side effect $(x)(T_x \dashrightarrow E_x)$. The two specific abstract propositions that form the formal statement "*telling*" are: "Doctor Adams offers a treatment preferred by the hospital," *and* "describes different treatment options, and their side effects," $(T_{Adams} \dashrightarrow E_{Adams})$ see Table C-1.

$$A = (x)(T_x \dashrightarrow E_x)$$
$$I[(x)(T_x \dashrightarrow E_x)] = (x)(T_x \dashrightarrow E_x)$$
$$= I(T_{Adams} \dashrightarrow E_{Adams})$$
$$= (T_{Flynn} \dashrightarrow E_{Flynn})$$

The identity transformation, when applied to all the cases that preserve the relation between T_x and E_x, forms the formal order equivalence class.

Similarly for the "understanding" statement, the implicative statement is, *if* the patient relates the treatments' effects back to the doctor *then* the patient understands $(E_x \dashrightarrow U_x)$. For Dr. Adams, the two specific abstract propositions that form the formal relational statement "understanding" are: "the doctor describes different treatment options...side effects," and "the patient is asked to explain these things back to the doctor," $(E_{Adams} \dashrightarrow U_{Adams})$ see Table C-2. *If* Adams describes side effects (E), and asks the patient to explain that back (U), *then* the doctor confirms understanding.

Systematic Stage Equivalence Classes
Informing

When the two formal statements, "*telling*" and "*understanding*" are coordinated they form a systematic equivalence class, *informing*. To identify a systematic equivalence class, the subject has to detect two formal statements that are similar. For example, in the formal statement *telling*, the doctor "tells the patient about treatment options" (T_x), *and* their corresponding "side effects" (E_x). This statement F_1 is that T_x is correlated with E_x. In the formal statement F_2, *understanding*, "the doctor tells the patient about side effects" (E_x), *and* "asks the patient to relate back that information" (U_x). Together statements, F_1, *with* F_2, describe the system, S_I, of the doctor *informing* the patient about the treatment. All doctors' accounts of so informing their

patients belong to that equivalence class. Note that there is only 1 doctor pair that is similar in this way, Adams and Flynn.

The informing system coordinates *telling* with *understanding*. It takes the form, **if** 'the doctor *tells* about all treatments' side effects,' *and then* 'the patient demonstrates an *understanding* by relating back that information,' **then** *informing* has taken place:

$$(T_x \text{ --> } E_x) \textbf{ --> } (E_x \text{ --> } U_x) = (F_1 \textbf{ --> } F_2) = S_I = \text{Informing.}$$

Consenting

Two other formal order statements, in the vignettes, form a second systematic order equivalence class, *consent*. The first formal statement F_1, *obtaining the agreement*, consists of two abstract propositions. For example, the doctor indicates that the offered treatment is a recommendation and not a command by saying "experts found other treatments to have less favorable results," R_1, and *then* leaving the decision up to patient by asking "if the patient accepts the suggested treatment," L_1. The second formal statement F_2, *preparing for treatment*, similarly consists of two abstract propositions, "feeling doctor knows best," J_1, and *then* "the patient prepares for treatment," P_1. Together statements, F_1, *and* F_2, describe the system S_C of the doctor attempting to obtain *consent* for administering the treatment. The consent system coordinates *obtaining* the agreement with *preparing* for the treatment. It takes the form, **if** 'the doctor tells how the treatment decision will be made,' *and* 'asks the patient for agreement' and *then* the patient engages in the judgement process, by 'feeling the doctor knows best,' *and* agrees with the doctor by 'preparing for the treatment,' **then** *consent* has taken place:

$$(H_x \text{ --> } O_x) \textbf{ --> } (J_x \text{ --> } U_x) = (F_1 \textbf{ --> } F_2) = S_C = \text{consenting.}$$

All doctors' accounts of so obtaining consent from their patients belong to that equivalence class. The subject determine whether these consent systems are similar or dissimilar.

The hierarchical complexity of the equivalence class is the same for "informing" and "consenting." However, subjects performing systematic perspective-taking identify informing as a single class of statements, and consenting as another single class of statements. They will detect each system separately. They will not coordinate the two systems. Adams and Flynn will appear similar with respect to informing. Casey and Greys will appear similar with respect to consent. Thus, systematic perspective-tasking yields two pairs of doctors that appear similar.

Metasystematic Stage Equivalence Classes

Finally, the metasystematic equivalence class is formed by coupling the two systems S_I *with* S_C. Metasystematically, *consenting* is not independent of *informing*. Statements that systematically belonged to the informing system, now also belong to the consent system. For example, the elements that belong to ***informing***, S_I, *telling* and *understanding* are part of ***consenting***, S_C, *obtaining agreement* and *preparing for treatment*. S_I *with* S_C, are two systematic elements that form a metasystematic equivalence class, M_{IC}, *Informed-consent*. All the positive forms of the statements belong to the *informed-consent* equivalence class. Subjects that detect this relationship are performing metasystematically. Only one vignette pair is similar in this way, Casey and Greys.

Because the metasystematic super-system, M_{IC}, *informed-consent*, consists of two systematic elements, *informing* and *consenting* and their alternatives, it is possible to test whether subjects can use the supersystem (informed, not informed; consent, no consent) to detect instances that violate the metasystem of *informed-consent*.

Casey and Greys fail the same part, *informing* (I), and succeed at the same part, *consenting* (C):

$$A = M_{IC}$$
$$M_{IC} = (S_C \text{ ---> } S_I).$$
$$I[(x)(S_C \text{ ---> } S_I)] = (x)(S_C \text{ ---> } S_I)$$
$$= I(S_{C,Casey} \text{ ---> } S_{I,Casey})$$
$$= (S_{C,Greys} \text{ ---> } S_{I,Greys})$$

The identity transformation, I, when applied to all the cases that preserve the relation between S_C and S_I forms the metasystematic order equivalence class, M_{IC}. Failing to obtain informed-consent would be:

$$N(I)$$
$$N(I) = (S_C \ \& \ -S_I) = -(S_C \text{ ---> } S_I)$$
$$= -(S_{C,Casey} \text{ ---> } S_{I,Casey})$$
$$= -(S_{C,Greys} \text{ ---> } S_{I,Greys})$$
$$\text{Casey} = \text{Greys}$$

When subjects assert that Casey and Greys are similar they are performing the metasystematic criterion.

One important oversight in the design of the vignettes should be mentioned. Table C-3 in Appendix C shows that the consent system is not consistent across some vignettes. Ideally, doctors should perform four abstract propositions in order for their performance be fully systematic. In that case, all doctors who perform the same four actions are systematically similar. However, that is not the case. Doctor Flynn who performs all four abstract propositions in the consent system does not match doctors Greys and Casey who also perform the consent system. Although Greys and Casey are perfectly similar to each other they differ from Flynn with respect to one abstract proposition. That means there are two representations of the consent system.

However, this does not create a great obstacle for analytical assessment of metasystematic perspective-taking. The total degree of similarity, both dimensions--informed-consent and stage, is based on the total number of positive abstract propositions performed by each doctor. Greys and Casey share the highest degree of similarity, they are 100% similar. They are metasystematically similar. They fail to inform in exactly the same way, and they represent systematic perspective-taking because they perform consent in exactly the same way. No other doctor pairs are as similar. Metasystematic performance requires subjects to detect that Greys and Casey are the most similar pair. That is the only pair that should be rated highest on the scale. Therefore, for analysis of metasystematic perspective-taking it does not matter that Flynn's consent descriptions do not perfectly match with Greys's and Casey's.

To control this discrepancy for subjects performing systematic perspective-taking, the pairs Flynn and Casey, and Flynn and Greys are not considered systematically similar by the experimenter. Note that some subjects performing systematic and presystematic perspective-taking may experience difficulty with these vignettes pairs.

Appendix D

The General Stage Scoring Scheme (adapted for The Doctor-Patient Problem

Subjects' verbal responses were scored with the General Stage Scoring Scheme (Commons et al, 1991). Scoring, in the GSSS is a logical analysis of the structure of the reasoning of a specific statement, rather than an examination of the content of the subject's argument. In applying this procedure, the scores resulting on specific statements are usually equivalent to scores determined through other procedures (Colby & Kohlberg, 1987; Armon, 1984; Perry, 1968, 1970, 1981). However, with the GSSS, fewer statements require guess scoring or are designated as unscorable. Further, statements can be scored even though they do not answer a standardized question or problem, allowing greater flexibility for interviewers in examining a variety of dilemmas or tasks. GSSS, thus, may be applied to any form of discourse.

Dialectical scoring

The following sequence of steps are required for most accuracy in scoring the statements:

a. Identify the statement's assertion status, whether it is a positive assertion or a negative assertion
   1. A positive assertion is a statement that claims something *has* taken place, such as "Dr. X did inform the patient."

   2. A negative assertion is a statement that claims that something has *failed* to occur, such as "Dr. X did not really ask the patient if the treatment was acceptable."

b. Determine what kind of actions the subject's statement describes. What reason does the subject give for asserting that the doctor pair is similar? Does the subject describe concrete things, abstract propositions, formal statements, systematic actions, etc. This *generally* places the hierarchical complexity of the statement.

1. Concrete descriptions single out specific things in the vignettes that match, such as specific words or phrases (e.g. "the hospital," or "medical community").

2. Abstract descriptions make generalizations about the doctors' actions, such as "both doctors told their patients about side effects."
3. Formal descriptions form causal relations between two abstract actions, such as "the doctors not only told the patient about treatment options, but also told about their side effects."
4. Systematic descriptions link (coordinate) causal relations about the doctors' actions. For example, "both doctors told their patient about several treatment options and side effects, then asked their patients to explain it back. This way, they would be certain the patient understood."
5. Metasystematic descriptions link two systems of formal actions. Such an explanation relates consent to informing. The subject may say: "These patients do not really have a choice because the doctors did not tell them about treatment options and side effects, they did not make sure the patients understood what they were told. Even though the patient was asked to make the decision, a patient cannot really make a decision under those conditions. They don't know enough."

c. When more than one explanation is examined, as in the Doctor-Patient Problem with ten vignette comparisons, a global analysis is performed. The explanations for the target vignettes are scored first. The explanations for any false alarms are scored second. Correct rejections are scored last. When a subject's explanation of the target vignettes fails to fulfill the given stage criterion, then false alarms and correct rejections are assessed to determine transitional performance.

The global analysis is important because it is not always possible to determine how the subject is coordinating a specific set of ideas. For example, the subject may not give all the reasons why a particular pair of vignettes appears similar. The experimenter has to determine if the subject is reflecting at a more complex level by comparing the subject's responses across the other explanations.

Transitional performance, steps and substeps

Table 1 (see below) describes transition steps (from Stage n to Stage n-plus1) in the General Stage Scoring Scheme. There are 5 traditional steps (0 through 4) that describe this transition. Commons et al (1984, 1990, in preparation) have interjected three substeps based on empirical evidence. The seven steps repeat within each new stage.

Table 1.
INTER-STAGE TRANSITION

Increments	
Stage	Step/Substep
Stage n	Step 0 a = a' with b' (Subject becomes aware that previous stage synthesis does not solve all tasks).
	Step 1 b (Inversion, antithesis, or alternate scheme. Subject forms a second synthesis of previous stage actions).
	Step 2 a *or* b (The subject alternates between the two schemes, i.e. thesis and antithesis. The two schemes coexist, but there is no attempt to coordinate the two schemes).
	Step 3 a *and* b ("smash" The subject begins to attempt to coordinate the two schemes. The following substeps are attempts at synthesis, unsuccessful coordination can result in regression to Step 2: The subject makes such statements as "never mind, I'm not sure anymore").
	Substep 1 Elements from Step 0 and Step 1 are included in a non-systematic, non-coordinated manner. Incorporates various subsets of required elements.
	Substep 2 Incorporates subsets that produce hits at stage n. They also produce false alarms (Downward assimilation).
	Substep 3 Incorporates subsets that produce correct rejections at stage n. They also produce misses (critical elements are not always detected).
Stage n	Step 4 a *with* b (Concoction, thesis) new temporary equilibrium (synthesis and new thesis). Full integration of a with b = A. (Perfect performance, no false alarms & no misses).
Stage n Plus 1	Step 0 A = a with b (The new thesis composed of a with b does not solve all tasks. Subject begins search for alternate scheme, antithesis).

Subjects' responses meet the stage-n criterion when they have verbally integrated the doctors' actions as described in step 4. For example, a metasystematic explanation would articulate that doctors Casey and Greys are not similar because of the degree to which they involve their patients in the decision making process. That would include describing the specific actions (abstract propositions, formal statements, etc.) taken by the doctors to insure that the patients are informed and know of their right to accept or refuse treatment.

Only responses that meet the step 4 criteria are scored fully at the given stage. Transitional performance meets any criteria from step 0 to substep 3 inclusive. Note that the difference between a subjects' response at step 4 of one stage and step 0 of the next stage is that at step 0 the subject recognizes that the step 4 action does not always work. The subject makes statements like "It was clear to me before but now I'm not so sure." That realization marks the start of the transition process toward the next higher stage. At this point the subject does not have a new strategy with which to replace the step 4 action.

Step 1 marks the forming of an alternate hypothesis. Step 1 results from instances in which use of the first hypothesis fails to produce satisfactory outcomes. Using the same order of hierarchical complexity the subject forms an alternate hypothesis (possibly an antithesis) that accommodates specific instances the first hypothesis failed to satisfy. The subject uses the antithesis until it fails to satisfy higher stage demands.

When that happens the subject will enter step 2, and alternate between the hypothesis and the antithesis, attempting to explain as much of the more complex occurrence as possible. Note that step 2 does not coordinate hypothesis and antithesis.

Step 3 marks the beginning of the subject's effort to coordinate the hypothesis and antithesis to form a more complex structure, a higher order of reasoning. There are three substeps in this phase, each marking different kinds of errors that the subject makes before successfully coordinating the next higher order scheme. These substeps are empirically derived.

Substep 1 is marked by instances where the subject obtains a limited grasp of the next higher order scheme. The subject understand that some elements work together but does not know why. The ratio of hits, false alarms and misses is the same.

Substep 2 evidences a grasp of why certain elements go together, but the subject does not always differentiate them from elements that do not work together. This causes the subject to confuse lower stage schemes with the true higher stage scheme. The subject's explanation will include both false assertions, or false alarms and correct assertions.

Substep 3 evidences a lessening of false alarms, but an increase in misses. Subjects can now explain that the combination of certain individual actions do not necessarily form more complex behavior. However, the subject cannot always articulate or identify such an integration.

At step 4 the subject is able to distinguish sets of instances that form more complex elements from sets of instances that do not. The subject rejects sets of actions taken by the doctors that do not fulfil a higher order set of ideals. For example, the subject may assert that informing requires not only telling about treatment options and side effects but also require the doctor to make certain that the patient has understood the information.

Subjects' explanations are scored according to these parameters. Each explanation is analyzed to determine the stage of the subject's hypothesis is. False assertions and misses in conjunction with hits will drop a subjects performance score from step 4 to substeps 2 or 3.

Appendix E

This Appendix offers supplementary support for the non-normal *d'* analysis performed on subject responses to Question 1. The analyses and tables presented here show that metasystematic perspective-taking can generally be explained by informed-consent. The tables also suggest that subjects performing metasystematic perspective-taking use more of the information embedded in the vignettes than subjects performing lower stage perspective-taking.

Analyses of questions 5 and 6 help determine subjects' systematic perspective-taking. Each question represents a systematic perspective-taking task. Question 5 asked subjects to rate whether the doctors "informed" their patients. Question 6 asked subjects to rate whether the doctors attempted to gain consent. Note that systematic perspective-taking only requires subjects to perform well in one of these tasks, not both. Therefore, tables 1 and 2 which show subjects' performance score should be reviewed together (see below). As expected, subjects performing fully metasystematic and transitional perspective-taking performed best on the systematic tasks. Tables 1 and 2 show subjects' sensitivity scores on the left. On the right, the tables show the correlations between the ratings and the stage of the doctor (DS), informing (INF), and consent (CON).

Of particular interest here is the performance of subjects who fail to perform the metasystematic task (groups 3 & 4). Their *d'* scores on the metasystematic task suggests they engage in systematic perspective-taking. Therefore, presumably these subjects should perform better on the systematic tasks. In fact, that is exactly the case. All subjects in groups 3 and 4 were sensitive to the systematic perspectives. Their sensitivity scores to questions 5 and 6 do indicate that they were able to detect one system (informed) or the other (consent).

Table 1 shows that subjects 2 and 5, in the systematic perspective-taking group (3), detected the informing system as their alpha scores indicate. In contrast, Table 2 show that subjects 12, and 17 detected the consent system, as their alpha scores indicate. These results support the hypothesis that subjects in group 3 perform systematic perspective-taking. These subjects tend to coordinate one system actions or the other. Subject 2 appears to detect both systems, as his alpha scores in each Table indicate. Note that his sensitivity score for informing is barely significant. These results suggest that subject may be in early transition to metasystematic perspective-taking.

Also of interest is the fact that Subject 10, in the presystematic group
detected the consent system (see Table 2). That result concurs with the qualitative assessment that Subject 10 is in early transition to systematic perspective-taking.

Table 1.

Subject sensitivity to the doctors' *informing* and the stages of the doctors. Supported Systematic perspective-taking: *Question #5 (Rating the informing)*

		Stage 5a		Correlations between ratings & predictors		
Sub#	Ratings	d'	*p*-Value*	DS	INF	CON
Metasystematic Group 1 (*d'* & Fisher Exact test suggest performance is metasystematic)						
3	5	1.0	0.0119	0.78	0.92	0.71
6	6	1.0	0.0278	0.65	0.70	0.85
8	6	1.0	0.0119	0.49	0.92	0.29
11	7	1.0	0.0119	0.75	0.77	0.44
13	7	0.6	0.1190	0.09	0.57	0.53
15	5	1.0	0.0119	0.84	0.86	0.75
16	6	1.0	0.0119	0.70	0.95	0.67
Transitional Group 2 (*d'* & Fisher Exact test suggest performance is transitional)						
1	7	1.0	0.0119	0.68	0.97	0.55
4	5	0.8	0.0476	0.50	0.70	0.47
7	7	1.0	0.0119	0.72	0.97	0.49
9	7	1.0	0.0119	0.77	0.86	0.54
14	6	1.0	0.0119	0.64	0.98	0.44
18	2	0.8	0.0476	0.57	0.77	0.52
Systematic Group 3 (*d'* & Fisher Exact test suggest performance is Systematic)						
12	3	0.6	0.1190	0.56	0.27	0.37
2	6	0.8	0.0476	0.53	0.84	0.54
5	7	0.8	0.0476	0.91	0.55	0.77
17	3	0.6	0.1190	0.37	0.72	0.39
Presystematic Group 3 (*d'* & Fisher Exact test suggest performance is presystematic)						
10	3	0.6	0.1190	0.65	0.70	0.85

* Fisher's Exact with Overall's correction, 1 tailed.

Table 2.

Subject sensitivity to the doctors' attempting to gain consent and the stages of the doctors. Supported Systematic perspective-taking: *Question #6 (Rating the consenting)*

	Stage 5a			Correlations between ratings & predictors		
Sub#	Ratings	d'	*p*-Value*	DS	INF	CON
Metasystematic Group 1 (*d′* & Fisher Exact test suggest performance is metasystematic)						
3	5	0.75	0.0397	0.44	-0.10	0.71
6	7	0.50	0.0278	0.47	0.14	0.91
8	5	1.00	0.0079	0.58	0.35	0.61
11	7	1.00	0.0079	0.67	0.00	0.81
13	7	1.00	0.0079	0.76	0.07	0.65
15	3	0.75	0.0397	0.84	0.86	0.75
16	2	0.67	0.0476	0.80	0.74	0.75
Transitional Group 2 (*d′* & Fisher Exact test suggest performance is transitional)						
1	7	1.00	0.0079	0.46	-0.15	0.72
4	5	0.17	0.3571	-0.59	-0.85	-0.43
7	5	1.00	0.0079	0.49	-0.29	0.31
9	6	1.00	0.0079	0.31	-0.24	0.67
14	6	0.33	0.1667	0.59	0.66	0.78
18	0	0.00	1.0000	-0.41	-0.31	-0.83
Systematic Group 3 (*d′* & Fisher Exact test suggest performance is Systematic)						
12	4	1.00	0.0079	0.57	0.08	0.74
2	6	1.00	0.0079	0.87	0.36	0.69
5	5	0.67	0.0476	0.91	0.55	0.77
17	3	0.75	0.0397	0.20	-0.28	0.27
Presystematic Group 3 (*d′* & Fisher Exact test suggest performance is presystematic)						
10	3	0.75	0.0397	0.67	0.87	0.65

* Fisher's Exact with Overall's correction, 1 tailed.

Performance in the supported metasystematic task

Following Vygotsky's (1962; 1978) notion of "scaffolding," Fischer (1980) showed that subject performance generally improves by one stage in "the optimal condition." In the optimal condition subjects are told what the task requirements are beforehand. Question 4 meets this requirement by identifying the metasystematic equivalence class to the subjects. Subjects are asked to assert which doctors obtain informed-consent. We know from our earlier discussion on equivalence classes that to meet metasystematic demands subjects must identify the metasystematic equivalence class for themselves. Therefore, Question 4 does not place metasystematic demands on the subjects. Instead, subjects only have to find doctors that match the classification "informed-consent." Subject should obtain higher scores in the supported condition (Question 4) than in the non-supported condition (Question 1) because they do not have to construct the metasystematic equivalence class from scratch. Fischer (1980) calls the improved performances evidenced in supported tasks "jumps."

Table 3 (see below) shows the results of subjects' responses to Question 4, including the *d′* scores and the correlation between the rating and information in the vignettes. Note that subjects are not identifying "differences" between doctor pairs as they were on Question 1. Here, the individual doctors are rated on whether they obtain informed-consent (IC), and the stage the doctor's perspective represents (DS). The correlation between these variables and the subjects' rating are presented to the right of each *d′* score.

Table 3.
Informed-consent and the stages of the doctors help explain subjects' rating in a Support Condition : *Question #4 (Rating which doctors obtained informed-consent)*

		Stage 5b		Correlations between ratings & predictors	
Sub#	Ratings	d'	*p*-Value*	IC	DS
Metasystematic Group 1 (*d'* & Fisher Exact test suggest performance is metasystematic)					
3	6	1.000	0.0278	0.95	0.79
6	6	1.000	0.0278	0.68	0.63
8	7	1.000	0.0278	0.44	0.74
11	7	1.000	0.0278	0.64	0.84
13	7	0.833	0.0833	0.87	0.60
15	6	1.000	0.0278	0.96	0.82
16	7	1.000	0.0278	0.98	0.71
Transitional Group 2 (*d'* & Fisher Exact test suggest performance is transitional)					
1	7	1.000	0.0278	0.70	0.52
4	7	1.000	0.0278	0.42	0.56
7	7	0.833	0.0833	0.91	0.66
9	7	1.000	0.0278	0.68	0.60
14	6	1.000	0.0278	0.97	0.76
18	2	1.000	0.0278	0.49	0.29
Systematic Group 3 (*d'* & Fisher Exact test suggest performance is Systematic)					
12	7	1.000	0.0278	0.44	0.58
2	7	1.000	0.0278	0.79	0.79
5	7	1.000	0.0278	0.74	0.91
17	6	1.000	0.0278	0.27	0.05
Presystematic Group 3 (*d'* & Fisher Exact test suggest performance is presystematic)					
10	3	0.000	1.0000	0.00	0.00

* Fisher's Exact Test with Overall's correction.

The correlations in Table 3 show that fifteen of the eighteen subjects isolated the metasystematic perspective-taking doctor. This general "jump" in the performance of subjects concurs with Fischer's (1980) claim that in supported tasks subjects' performance improves. The high correlations between subjects' ratings and the information embedded in the vignettes generally supports the hypothesis that once the equivalence class is identified subjects are able to coordinate its constituents.

The last two tables illustrate subjects' preferences (Rest, 1980). Questions 2 asked subjects which doctors' methods they preferred. Table 4 shows the sensitivity scores and the correlations between the subjects' ratings and the information embedded in the vignettes. The d' scores indicate if subjects preferred the one doctor who obtained informed-consent. The correlations on the right of Table 4 suggest that in the preference condition subjects do not necessarily base their choices exclusively on informed-consent. Still, there is a general tendency for subjects in the metasystematic group to use more of the information embedded in the vignettes than subjects performing lower stage perspective-taking. The high d' scores concur with Rest's (1980) findings that subjects' performance tends to improve on a preference task.

Note that one subject (13) in the metasystematic group did not base her preference on informed-consent. The correlations on the right of Table 4 support that hypothesis. Subject 13 turned out to be a unique case in the sample. She asserted that she recently had a bout with a terminal disease. She said that she had felt so vulnerable that she found herself preferring doctors who asserted themselves and made her feel that they new what they were doing. She appreciated their sense of control in the situation. Although from a scared patient's point of view such doctors may be appreciated and even preferred, doctors are not infallible. They still need to make information available to the afford the patient the opportunity to decide. The patient can then decide let the doctor take over. Subject 13 found that doctors Greys and Casey reminded her of her own doctors, to whom she felt indebted. They were her preferred choices in the preference condition. Subject 13's personal experience biased many of her ratings.

Table 4.
Subject preference for informed-consent: *Question #2 (Rating the doctors' Methods)*

		Stage 5b		Correlations between ratings & predictors	
Sub#	Ratings	d'	*p*-Value*	IC	DS
Metasystematic Group 1 (*d'* & Fisher Exact test suggests performance is metasystematic)					
03	7	1.000	0.0278	0.93	0.76
06	5	1.000	0.0278	0.71	0.61
08	7	1.000	0.0278	0.86	0.87
11	7	1.000	0.0278	0.94	0.85
13	0	0.000	1.0000	-0.02	0.45
15	6	1.000	0.0278	0.84	0.85
16	7	1.000	0.0278	0.93	0.73
Transitional Group 2 (*d'* & Fisher Exact test suggests performance is transitional)					
01	7	1.000	0.0278	0.70	0.52
04	7	1.000	0.0278	0.58	0.50
07	5	0.667	0.1667	0.39	0.87
09	6	0.833	0.0833	0.78	0.47
14	7	1.000	0.0278	0.93	0.75
18	5	0.833	0.0833	0.65	-0.02
Systematic Group 3 (*d'* & Fisher Exact test suggests performance is systematic)					
12	6	0.833	0.0833	0.48	0.80
02	7	1.000	0.0278	0.87	0.74
05	7	1.000	0.0278	0.62	0.91
17	6	1.000	0.0278	0.39	0.19
Presystematic Group 3 (*d'* & Fisher Exact test suggests performance is presystematic)					
10	4	1.000	p<0.0278	0.58	0.84

* Fisher's Exact Test with Overall's correction.

Table 5 (see below) shows subjects' preferences in a supported condition. Question 3 asks subjects which doctors' take the patients' point of view. That question asks subjects to rate the doctors' perspective-taking skills. Subjects' d' scores are very similar to their performance scores in the supported informed-consent condition (Question 4). The results show that fifteen of the eighteen subjects chose the metasystematic perspective-taking doctor. Subjects equate taking the patients point of view with informed-consent. Dr. Flynn was the only target doctor because Flynn informed the patient and included the patient in the decision making process. The high d' scores concur with subjects' performance in the other supported conditions (Fischer, 1980; Vygotsky, 1962).

Table 5

Subject sensitivity to informed-consent and the stages of the doctors in the Supported-Preference Condition: *Question #3 (Rating which doctors take the patient's point of view)*

Sub#	Ratings	Stage 5b d'	*p*-Value*	Correlations between ratings & predictors IC	DS
Metasystematic Group 1 (*d′* & Fisher Exact test suggests performance is metasystematic)					
03	6	1.000	0.0278	0.76	0.56
06	6	1.000	0.0278	0.64	0.44
08	7	1.000	0.0278	0.41	0.59
11	7	1.000	0.0278	0.70	0.89
13	2	0.167	0.5833	-0.02	0.45
15	6	1.000	0.0278	0.88	0.93
16	7	1.000	0.0278	0.91	0.81
Transitional Group 2 (*d′* & Fisher Exact test suggests performance is transitional)					
01	7	1.000	0.0278	0.74	0.63
04	7	1.000	0.0278	0.38	0.44
07	5	0.833	0.0833	0.64	0.74
09	7	1.000	0.0278	0.91	0.64
14	5	1.000	0.0278	0.93	0.65
18	0	0.000	1.0000	0.00	0.00
Systematic Group 3 (*d′* & Fisher Exact test suggests performance is systematic)					
12	7	1.000	0.0278	0.36	0.51
02	7	1.000	0.0278	0.64	0.15
05	7	1.000	0.0278	0.83	0.91
17	5	1.000	0.0278	0.07	0.00
Presystematic Group 3 (*d′* & Fisher Exact test suggests performance is presystematic)					
10	4	1.000	0.0278	0.88	0.73

* Fisher's Exact Test with Overall's correction.

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1976-1978 Assistant Teacher--Quarrels School, Englewood New Jersey.

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Memberships, Offices and Committee Assignment in Professional Societies:

1985- The Jean Piaget Society
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Publications

Commons, M. L., Rodriguez, J. A. (1990). "Equal access" without "establishing" religion: The necessity for assessing social perspective-taking skills and institutional atmosphere. Developmental Review.

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Commons, M. L., Rodriguez, J. A. (1987, January). The lore of approaching tasks and the meaning of test lingo: Crosscultural interviews. Paper presented at Universidad Autonoma de Baja California, Mexicali, Baja California, Mexico.

Commons, M. L., Strachan, D. D., Rodriguez, J. A., & Barnett, M. A. (1987, January). The effect of moral judgment stage on the utility function form in young adults: The decision to sacrifice one's own grades to keep tutoring commitments. Paper presented at the symposium, "From moral action to judgement and back: The relationships between action and stage" Cambridge, MA.

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In preparation

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1. The Notion of Stages: When a person successfully performs a task at a given order of hierarchical complexity, the stage of their performance is considered to be of the equivalent order, according to the General Stage Model (GSM) of Commons and Richards (1984b). The General Stage Model (Commons and Richards, 1984b), as well as Skill Theory (Fischer, Hand & Russell, 1984), have demonstrated that Kohlberg's (1984), Armon's (1984a, b) and Selman's (1976) half steps are actually whole stages. Consequently, these "half stages" will be regarded as full stages in the present paper.

2. E. Joram (personal communication, Friday, June 26, 1987) suggested a modification to the upper end of the stage sequence in the General Stage Model. What is now called Stage 6b, cross-paradigmatic (Moral Stage 7), directly followed Stage 5b, metasystematic (Moral Stage 5). The

name metasystematic was suggested by Deanna Kuhn. Now, we recognize an intermediate stage number as Stage 6a, paradigmatic (Moral Stage 6). The name paradigmatic was inspired by Thomas Kuhn's (1962, 1972) work.

3. For ease of reference, here d' means non-normal d'. Traditionally d' is derived from z scores. Non-normal d' is derived from raw scores.

4. Other researchers have found that subjects in transition evidence drops in performance. Piaget (1972) calls this "disequilibrium." See also Kohlberg 1984.