

Including Deontic Reasoning as Fundamental to Theory of Mind

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Conceptual development • Culture • Deontic reasoning • Theory of mind

Abstract

While recognizing major contributions of the contemporary theory-of-mind framework, we identify conceptual and cultural gaps with respect to its inattention to deontic considerations. The framework has tended to portray behavior as purely self-directed, thereby neglecting everyday reasoners' understanding of behavior as normatively based. However, in everyday reasoning, belief-desire (theory of mind) and obligation-permission (deontic) concerns interrelate. Moreover, both belief-desire reasoning and obligation-permission reasoning are early developing, universal, and inseparable in children's understanding of persons. Thus, for both conceptual and empirical reasons, deontic and mentalistic perspectives should be seen as interdependent and integrated in understanding theory of mind.

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'Theory of mind' constitutes one of the most dynamic areas of research in contemporary developmental psychology, giving rise to a vast international, interdisciplinary literature. Key to theory-of-mind research and theory has been a conceptual framework focused on belief-desire reasoning. According to this framework, everyday social reasoners understand people's behaviors in intentional terms as purposive, and in doing so, focus on the agent's goals and desires as shaped by the agent's knowledge of or beliefs about the pertinent situation.

Although claims about everyday understandings of theory of mind have received wide-scale support in cross-cultural developmental research, concerns remain about the conceptual scope and cultural inclusiveness of the theoretical model. We advocate a broader construal of theory of mind encompassing conceptions not only of individual actors with their beliefs and desires, but also conceptions of social influences on action and thought, in particular, obligations and permissions. In con-

trast, contemporary discussion of theory of mind tends to portray persons as autonomous agents – intentional actors whose actions are determined exclusively by individual choices, preferences, and beliefs.

Deontic reasoning concerns what someone may, should, or may not, should not do, and so includes conceptions of obligation and permission that bear on the nature of normative expectations, and encompass conceptions of agents in terms of role relationships and social context. We contend that deontic reasoning is not merely a form of social understanding of interest in its own right, but is important to the types of psychologically based inferences that form the subject matter of an everyday theory of mind.

An alternative to our position would be that naive psychological reasoning and naive deontic reasoning are two very separate competences. Many contemporary scholars believe that human knowledge and reasoning is domain-specific to a significant degree [Hirschfeld & Gelman, 1994]. ‘People from a very early age and through all of their adult lives seem to think differently about different domains, including the domains of naive physics, naive biology, naive psychology, and naive sociology’ [Atran, 1996, p. 217]. In distinguishing naive psychology from naive sociology, Atran follows Hirschfeld [1996] and in this account, naive psychology, or theory of mind, is based on attribution of ‘intentional relationships to one another’s beliefs, desires, and actions’ [Atran, 1996, p. 217], whereas naive sociology is based on ‘group assignments (e.g., kinship, race) that specify a range of deontological obligations and contractual actions’ [Atran, 1996, p. 217]. Somewhat similarly, several scholars argue for an innate ‘moral faculty’ [Harman, 1999; Hauser, in press] separate from an innate psychological faculty. As deontic concerns are central to moral reasoning, these discussions also segregate the deontic and the mental as very separate human reasoning systems.

We argue that the mental and the deontic cannot be so simply distinguished, and that naive psychology, properly understood, includes both concerns. Our approach is initially conceptual; then we consider empirical data that support the validity of our broadened framework. Along the way, we consider alternative proposals and accounts.

Traditional Theory-of-Mind Framework

Research on social cognition, implicit personality theory, and attribution has a long history, consistently shaped by formative ideas about the conceptual primitives or organizing constructs argued to be embodied in everyday thought about people [Heider, 1958; Kelley, 1967; Piaget, 1932; Tagiuri, 1969]. Common to these different discussions are the assumptions that naive psychology allows everyday reasoners to go beyond surface, ‘behavioral’ descriptions of persons and actions to deeper, more psychologically meaningful understandings and attributions. These assumptions are likewise shared in contemporary discussions of theory of mind. Moreover, theory-of-mind research has been based on a specific characterization of the conceptual nature of this everyday mentalistic reasoning. This characterization drew on discussion in philosophy of mind [e.g., Churchland, 1981; Dennett, 1987; Stich, 1983] and upon the philosophical tradition of action theory [e.g., Anscombe, 1957; Davidson, 1963, 1980].

According to this now widely accepted framework, two generic sorts of mental states – beliefs and desires – are claimed to organize mental life and intentional action, as understood in our everyday folk psychology: we see each other as executing acts that we *think* will get us what we *want* [D’Andrade, 1987; Fodor, 1987; Premack & Woodruff, 1978; Wellman, 1990]. A shorthand description of everyday psychology as centering on belief-desires is both apt and simplistic. For example, the scope and variation of ‘belief’ or ‘desire’ must be understood very broadly. For beliefs, ‘in addition to *believing* that p, a person may *suspect* that p, *think* that p, *feel* that p, *assume* that p, *remember* that p ...’ [Stich, 1983, p. 217]. Thus ‘belief’ includes a range of different convictions and knowledge considered as nonetheless similar sorts of mental states, the sorts of states which are meant to ‘represent the world as we take it to be’ [Stich, 1983, p. 217]. Desire is also a notion that ‘does yeoman work’ as Davidson [1980] puts it, referring to diverse motivational goals or directedness of the person, encompassing both desires and dispositions more narrowly considered. ‘Not only permanent character traits that show themselves in a lifetime of behavior, such as a love of children or a taste for loud company, but also the most passing fancy that prompts a unique action, like a sudden desire to touch a woman’s elbow’ [Davidson, 1980, p. 4]. Yet, even with such acknowledged elaborations, the traditional framework is arguably incomplete.

Challenges to the Traditional Framework

Particularly problematic, we believe, is that the traditional belief-desire framework portrays everyday psychology as an enterprise where behavior is conceptualized in freely chosen terms, with little attention given to the extent to which behavior is situated in a social-psychological context and may be undertaken in response to social rules, obligations, duties, and responsibilities that must inevitably also be at play. Equally, persons tend to be conceptualized exclusively as individual, autonomous agents, with little attention given to the extent to which they are social agents, whose psychological identity is socially based. Instead, beliefs and desires – and so the core of everyday psychology – are seen as exclusively self-directed, private states of unique individuals, satisfied by getting what one wants.

Consider two boys who clean the bathrooms at their summer camp: Bob, a camper whose assigned daily chore is bathroom cleaning, and John, whose assigned daily chore is gardening. For both, the behavior of cleaning the bathrooms may be explained in terms of simple belief-desire reasoning, for example, ‘Bob/John wants to get the bathroom clean.’ However, for Bob, the additional reason that this is his job seems crucial. Notably, this reason may be phrased either as a norm, ‘It is his camp job,’ or as a belief/desire about a norm, ‘Bob knows that it is his camp job/Bob wants to do his job.’ In either case, in cleaning the bathroom, Bob is fulfilling a normative expectation. The norm, in Bob’s case but not in John’s, provides ‘force’ to engage in the action, the thing that disposes Bob to undertake the behavior. Moreover, although Bob’s cleaning the bathroom remains intentional because it is normative, there is little ground for interpreting it as reflecting Bob’s distinctive individual states.

This sort of analysis is familiar; for example, it informs Kelley’s early covariation model of causal attribution, with its recognition that behavior which is consensual

provides little grounds for a dispositional inference [Kelley, 1967]. But it highlights the importance of recognizing that, in everyday psychological reasoning, behavior is typically understood not merely in freely chosen terms but additionally as normatively influenced. Even for John, for whom bathrooms are not his job yet he cleans them anyway, this normative context seems crucial. Within discussions of theory of mind everyday appreciation of these sorts of social-psychological considerations have been rarely mentioned. None of the 176 studies included in the 'meta-analysis of theory of mind' conducted by Wellman, Cross, and Watson [2001] went beyond consideration of beliefs and desires of individual actors to include a focus on social norms. Flavell and Miller [1998] provide a comprehensive review of contemporary research on the development of social cognition, as seen from a theory-of-mind perspective, and mention only briefly at the very end of their treatment anything about rules, roles, obligations, moral concerns, and the like. Perner [1991], in his treatment of theory of mind, similarly does not mention obligations, rules, norms or social roles, status, or expectations. Equally, although Nelson and her colleagues [2003] call for greater attention to the sociocultural construction of theory-of-mind understandings (in their view of children as entering a local 'community of minds'), they do not conceptualize theory-of-mind understandings as extending to deontic considerations.

Of course, the belief-desire framework does in principle accommodate such considerations as those raised by Bob and John, by noting that even for Bob it is his belief (about camp chores) and his desire (to undertake his chores) that are operative. But, we will argue that this is insufficient; a deontic focus is also required for an adequate characterization of everyday naive psychology and its development.

An informative perspective on this requirement emerges from discussions about cultural variability in adult folk psychologies of persons and selves – arguably representing the endpoints of theory-of-mind development [Lillard, 1998; Markus & Kitayama, 1991; Miller, 1984]. The traditional belief-desire framework, in slighting a deontic focus, skews theory-of-mind research and discussion toward a single sort of folk psychology (i.e., a European-American folk psychology of individual agency) rather than toward a broad range of folk psychologies. That is, in many European-American contexts, an emphasis tends to be placed on construing persons as individual selves, choosing actions to satisfy personal desires in ways that reflect stable self-relevant traits. The traditional theory-of-mind framework resonates with this emphasis; it too has emphasized individual agents attempting to satisfy personal desires. In a similar vein, theory-of-mind discussions have adopted the idea that an important endpoint of theory-of-mind development – the mature naive conception of the person – can be understood in terms of a trait psychology, or implicit personality. In brief, according to this perspective, traits are considered to be a developmental achievement of everyday understanding that consolidates and extends initial belief-desire understandings [Heider, 1958, p. 80; Wellman, 1990, p. 114–120].

However, this type of perspective is limited in that it fails to recognize that everyday attributions give emphasis to social relations and not merely to individual mentalistic considerations. In this regard, studies among US populations have shown that nearly a quarter of the attributions made in explanation of everyday behavior and in description of persons make reference to aspects of the social context [e.g., Miller, 1984, 1987]. Attention exclusively to psychological dispositions and to belief-desire considerations then seems inadequate to account for the nature of the psychological inferences made by US adults and so inadequately accounts for the

Table 1. Overview of the concepts of obligation and permission

	Obligation	Permission
<i>Criteria features</i>		
Invoking	required	allowed
Receiving	actor is constrained, or rejects	actor is unconstrained
Revoking	released (<i>permitted</i> to do/not do)	rescinded (<i>obliged</i> to do/not do)
Action	actor complies, or does not comply	actor exercises, or does not exercise
<i>Possible evaluations</i>		
Judgment	action/actor judged as good or bad, naughty or nice	action/actor judged as OK either way
<i>Possible social regulations</i>		
Action-reaction	authority monitors then re-invokes, insists and/or enforces sanctions, constraints	authority (observes) does nothing

endpoints of development in adulthood. The limitation of this type of perspective becomes more apparent in considering cultural variability in everyday attribution. Although trait references are made in everyday attribution by adults universally, they tend to be given less emphasis than are social role attributions among various other populations that have been studied, including Chinese, Japanese, and Indian cultural groups [Bond & Cheung, 1983; Cousins, 1989; Miller, 1984, 1987; Morris & Peng, 1994; Shweder & Bourne, 1984]. This work implies that adults' understandings of the psychological world universally mix deontic concerns into considerations of agency, with the relative emphasis placed on dispositional and deontic considerations being culturally variable. We will argue that basic psychological understandings in childhood also mix deontic with belief-desire appreciations, a mix that provides initial understandings suitable for varied cultural emphasis and elaboration, *and* a mix captured only under an appropriately broadened perspective on theory of mind.

The Nature of Deontic Knowledge and Its Role in Theory of Mind

In brief, here is our thesis: (*a*) theory of mind is fundamental to deontic reasoning; (*b*) conversely, deontic concerns are integral to theory of mind. As for *a*, not every social understanding has a psychological core; but basic deontic understandings – resting on notions of obligation and permission – do. As for *b*, not every factor that impinges on or regulates human action has a place within theory of mind; but deontic regulations do. Key to both *a* and *b* is the claim that deontic knowledge is (conceptually, for adults) inherently mentalistic.

The concepts that we argue are basic to deontic reasoning are the concepts of obligation and permission [for related arguments, see Heider, 1958; Holyoak & Cheng, 1995; Jackendoff, 1999; Searle, 2001; Talmy, 1988]. A brief conceptual overview of these everyday constructs thus grounds our argument. Table 1 helps outline this overview.

As shown in table 1, everyday understanding of obligations and permissions entails several conceptual features. At the top of the table are features that are definitional or criterial. For obligation, some action is required or obligated. The obligation socially constrains the action of an actor, *or* (equally important) the actor rejects (or attempts to reject) the obligation. In any event, an obliged action is no longer simply optional. Complementarily, for permission, some action is socially allowed or permitted. The actor is normatively allowed to engage in it, or not, depending on his/her desire, choice, or preference. In everyday conception, obligations and permissions thus embody a background notion of the social responsiveness of intentional action.

An important interconnection between obligation and permission is highlighted in the third row of table 1, when considering what happens when an obligation or permission is revoked, rescinded or voided. Revoking an obligation to do (say, feel, think) something releases the actor, who is thus now permitted to not do it. Revoking a permission to do something constrains the actor, who is thus now obliged to not do it. When faced with an obligation, an actor can either comply or not comply. With regard to permission, an actor can either exercise or not exercise his/her permit to act in a certain way.

Deontic acts often (although not criterially) elicit everyday evaluative judgments (from self, from individual or corporate others). Actions governed by obligations elicit positive or negative evaluative judgments, depending on their congruence with the obligation, whereas actions that are permitted are considered to be acceptable but are not appraised as right or wrong.

Deontic acts, in certain cases (although not criterially), may also elicit social-regulatory responses of an authority. An illustrative case of obligation (or permission) is when some authority obliges an actor to act (or some authority permits an actor to act). In this case, the authority obliges, and judges, regulates and so on. However, such a case is only illustrative, because, notably, not all obligations and permissions have their source in an authority. For example, the validity of moral obligations can be assumed to be intrinsic and not to be based on authority [Turiel, 1983]. Authorities, however, are involved in cases in which obligations or permissions have their source in social consensus, such as in the case of social conventions. They are also involved in cases in which obligations or permissions are socially regulated, such as may occur either for social conventions or for moral rules. Moreover, our use of the term authority is purposefully broad – it encompasses, for the purpose of capturing this aspect of everyday social-regulatory reasoning, persons in authority or attempting to exercise authority (including in egalitarian relations where the parties nonetheless regulate each other) as well as abstract, generalized authorities such as societal rules, conventional codes, or spiritual authorities. In this sense then, the authority can (on the basis of monitoring) sanction, enforce, and further constrain the actor who disobeys an obligation. For permissions, either exercising or not exercising the permit is *non*-consequential to the authority (though of course may be important, pleasant, or useful to the actor).

Certain approaches to deontic understandings, such as psychological work on moral development, target evaluative judgments as basic [Turiel, 1983]. From such a perspective, a key question becomes the type of rule, if any, that applies to a given behavior, such as whether the behavior is judged to be a matter of morality, social convention, or personal choice. Unlike the body of work on moral reasoning, our

approach targets obligation-permission reasoning as basic, with evaluative judgments seen as reflective of, rather than definitive for, deontic reasoning, and with attention given to the role of deontic considerations in understanding and explaining intentional behavior.

Obligation, Permission, and Theory of Mind

This brief background allows us to consider the fundamental overlap between obligations, permissions, and the mentalistic considerations traditionally subsumed within theory of mind. The key question we address is: what do we attribute when we attribute an obligation (or permission) to someone? This question concerns not how people decide which obligations apply, but rather their sense of what obligations are. To foreshadow the answer, the everyday sense of obligations is that they are inherently psychological (not merely behavioral).

Our contention that obligations, permissions, and mentalistic considerations overlap in crucial ways contrasts with a position that would argue that belief-desire and deontic reasoning are two very different and independent types of social cognition. Perhaps, as for Atran [1996] and Hirschfeld [2006], belief-desire reasoning is at the core of one naive domain (naive psychology) and deontic reasoning is embedded within a different domain (e.g., naive sociology, morality). Call this a nonoverlapping position.

One conceptual difficulty for any nonoverlapping position is that in everyday understanding, obligation, permission, and choice (desire-based, chosen action) seem so thoroughly intertwined. Permission and obligation surely overlap: recall, that at the least, invoking and revoking show the overlapping nature of obligation and permission in that revoking an obligation creates a permission, and revoking a permission creates an obligation. Moreover, in everyday understanding, if I oblige you to Z, I must permit you to Z. It makes no sense, it fails to capture the understood nature of an obligation, if I oblige you to Z but then (independently) fail to permit you to Z. At the same time, permissions, and even obligations, surely overlap with desire-based, psychological concerns. Permissions allow the actor to 'engage in an action if I desire;' obligations require the actor to 'engage in an action regardless of my desires' [Searle, 2001]. Such paraphrases highlight a critical relation between obligations, permissions, and desires, and thus between deontic reasoning and theory of mind, at least from this everyday perspective. Desires (a core belief-desire construct) seem as entrenched in everyday deontic reasoning as in everyday theory of mind.

These conceptual intertwining exist, we believe, because most basically, all these actions – obligated, permitted, and autonomous – are, in our everyday thinking, indelibly voluntary. That is, they are the provinces of intentional, psychological constraints and agencies. The intentional nature of persons and actions is, of course, fundamental to canonical belief-desire analyses of the sort emphasized in traditional discussions of theory of mind. The traditional belief-desire framework reflects, establishes, and elaborates an everyday conception of persons as intentional actors. But the intentional nature of action is requisite for everyday understanding of obligated and permitted actions as well.

Consider examples 1 and 2 below.

- (1) Joan has an obligation to
- walk not run.
 - raise her hand.
 - pledge allegiance.
 - *stop growing.
 - *hold her breath forever yet not die.
 - *float weightlessly off the ground.
- (2) Henry has permission to
- run not walk.
 - raise his hand.
 - not pledge allegiance.
 - *stop growing.
 - *hold his breath forever yet not die.
 - *float weightlessly off the ground.

As these examples demonstrate, in our everyday sensibilities an actor can only (sensibly) be obliged or permitted to do something he or she can carry out volitionally. This requirement is not just a background precondition for obligations and permissions. Rather, it is part of the very nature of our everyday conception of obligations and permissions themselves. It is because obligations enjoin *volitional*, intentional actions that they can be revoked as well as invoked. Similarly, because obligations enjoin *volitional*, intentional actions, they can be disobeyed or resisted as well as complied with. It is because permissions allow *volitional*, intentional acts that they can be exercised or not, at the discretion of the actor.

In sum, in everyday reasoning, desires and obligations interweave in our understanding and explanation of dispositions to act, tied together at the least by key notions of what it means to be intentional. The result is that theory of mind (understanding of intentional-psychological action) is fundamental to deontic reasoning. What about the reverse? Why and how should deontic concerns be seen as integral to theory of mind?

Consider this: I go under a roof to get out of the rain to avoid getting wet. To execute my intention (to avoid getting wet) I must take into account water falling and wetting things, how roofs work, and so on. Reasoning about the physical world thus figures in my decision-making. But this physical reasoning is not part of my theory of mind. This example raises the suspicion that the connection (or lack thereof) between deontic concerns and theory of mind is (merely) the same as that between physical concerns and theory of mind. Recall camper Bob. He does his bathroom cleaning job to avoid sanctions for failing an obligation. Reasoning about obligation figures in his decision-making. But (based on analogy to physical reasoning), why consider this deontic reasoning part of his theory of mind?

The important difference is that rain, roofs, and the like do not have psychological bases themselves. But (as just argued above), obligations and permissions do have psychological bases – they are, criterially, themselves intentional-psychological aspects of the (social) world. Deontic reasoning in the service of psychological decision-making is thus, importantly, thinking about intentional-psychological phenomena; just as thinking about desires or thinking about beliefs (in the service of psychological decision-making) is thinking about intentional-psychological phe-

nomena. Thinking about and dealing with such intentional-psychological phenomena is what constitutes theory of mind.

To reiterate, not every factor that impinges on or regulates human action has a place within theory of mind. But certain parts of the social world, including, importantly, the part we refer to as deontic, *do*. Obligations and permissions are not just separate parts of some external-physical world considered by everyday reasoners in order to anchor their theory-of-mind reasoning in this or that decision-making case; obligations and permissions, like beliefs and desires, are themselves intentional-psychological aspects of the world, and hence part of the very scope of theory of mind itself.

Nonoverlapping Concerns

In short, we argue that deontic understandings not only penetrate into the social regulatory world (of morality, rules, and social roles), they penetrate as well into the psychological world. Hence we advocate critical overlap between the two.

We can readily think, however, of three ways in which even an advocate of a nonoverlapping position might agree with much of our analysis so far, yet argue against its relevance or importance. (a) Perhaps obligations and permissions are intentional-psychological, but are peripheral, odd, atypical, bits of the mental-psychological world, and so not 'integral' to one's theory of mind. Extra sensory perception (ESP) (assuming one is skeptical and admits such ability, at most, for only rare cases or rare individuals) is an intentional-psychological phenomenon. But it is not (under these assumptions) 'integral' to everyday theory of mind. Obligations and permissions might be intentional-psychological in that way; peripheral to most everyday naive psychological reasonings. (b) Perhaps for adults, obligations and permissions are intentional-psychological phenomena, but the integrated character of belief-desire and obligation-permission reasoning is the product of extensive development – a merger of two initially separate sorts of (primitive, even primate) social cognitions – achieved only after many years of human maturity. If so, deontic reasoning would not be central to theory of mind until later in life. It could be argued that Piaget proposes that the integration of psychological-intentional reasoning with obligation-permission reasoning is indeed the product of extensive development. According to Piaget [1932], children's first sense of obligations (morals, rules) is that they are heteronomous and objective, and thus separate from the realm of the psychological and intentional. Only later (at 6 or 7 years) do the two connect. Relatedly, (c) overlaps or nonoverlaps between thinking of obligations and permission and thinking of intentional-psychological phenomena may be peculiar to only certain societies; only achieved (because only emphasized) in some cultural communities not others. If so, overlaps between the deontic and the mental, to the extent that they exist here but not there, are poor candidates for being fundamental to naive psychology broadly considered.

Empirical data can address such possibilities. The data suggest, as we will now briefly review, that belief-desire reasoning and obligation-permission reasoning are early and rapidly achieved, that they demonstrably interrelate early in life, and that this happens in a great many cultural communities worldwide.

Developmental Research

One way in which belief-desire reasoning and obligation-permission reasoning might easily prove empirically separate in development is if they appeared on very different developmental timetables [e.g., Cummins, 1996a; Kalish, 1998] or in very different cultural circumstances. So, we begin by noting that belief-desire reasoning is early developing as well as cross-culturally robust, and that obligation-permission reasoning is similarly early developing and robust.

Theory of Mind

Research on theory of mind is now voluminous; an earlier meta-analysis just of research using false belief tasks included almost 200 empirical studies [Wellman et al., 2001]. This research amply documents that young children's naive psychology needs to be understood as universal, early achieved, yet dynamic, with initial conceptual understandings that differ from the more elaborate conceptions available in older children and adults.

Almost as soon as they can talk young children refer to persons' desires, goals, and emotions [Bretherton & Beeghley, 1982; Dunn, 1988]. In doing this they refer to more than external actions and appearances (getting an object, showing a smile) and distinctively refer to internal feelings and wants. Thus even 2-year-olds explicitly distinguish mental states from actions in everyday conversation [Bartsch & Wellman, 1995; Wellman, Phillips, & Rodriguez, 2000] – 'I was sad but I didn't cry' – and also do so in laboratory judgment tasks [e.g., Wellman & Woolley, 1990]. Moreover, they distinguish one person's mental states (what you want/feel) from another's (what I want/feel) in conversation and in experiments. In these and other ways, they recognize certain internal states as subjective (not objective) phenomena of persons' inner lives.

By age 3 years or so, children refer not only to persons' desires and feelings but also to thoughts, knowledge, ideas. In this regard, a theory-of-mind milestone is the capacity to grasp that people hold beliefs that are recognizably false. For example, when 3-year-olds are shown a familiar crayon box and then shown that it actually has candy inside, they generally predict that someone else who has never looked inside will think it contains candies (not crayons) and report that they themselves thought it had candies at the start, before they ever looked inside. Five-year-olds generally say the other will think it has crayons and they themselves initially thought it had crayons. In all cultures and communities tested so far (including non-Western and nonliterate hunter-gathering ones) children achieve this insight in the preschool years [Wellman et al., 2001], although more or less quickly depending on conversational input and cultural emphasis [Callaghan et al., 2005; Ruffman, Slade, & Crowe, 2002]. Thus, just as English-speaking children talk about persons' desires well before later conversations about their beliefs and knowledge, so too do Beijing and Hong Kong children learning Mandarin and Cantonese [Tardif & Wellman, 2000], and so too do deaf children learning sign [Anderson & Reilly, 2002]. Just as carefully controlled tasks show understanding of desires before true belief and then false belief in normally developing English-speaking children [Wellman & Liu, 2004], this is true as well for autistic and deaf children [Peterson, Wellman, & Liu, 2005] and for children in Europe [Kristen, Thoermer, Hofer, Aschersleben, & Sodan, 2006] and in China [Wellman, Fang, Liu, Zhu, & Liu, 2006].

Just as there is ample evidence that mentalistic reasoning is early developing in all cultures, there is evidence that deontic reasoning is as well. This evidence comes from two sources: research focused on children's early moral understandings and deontic reasoning tasks.

Consider moral and conventional rules or dicta: you must not harm someone else, or boys must not wear dresses. Both invoke obligations, the violations of which are naughty or to be avoided, and the violations of which can be punished, enforced, and so on. However, these two sorts of obligations are importantly distinguishable [Smetana, 1981; Turiel, 1983]: they involve different relationships to authority – with moral conduct not seen as bound by mere societal authority, versus convention seen as governed precisely by societal authority; they differ with regard to who can revoke them – for moral obligations perhaps no one, for conventional obligations, consensus, parents, or laws can rescind them [Turiel, 1983]. Thus, moral obligations (as they are defined and considered in much developmental research on moral reasoning) are more generally in force across societies, whereas conventional obligations are in force in some locales and times *but* permitted in others. In these and other ways, appropriate distinction between moral and conventional rules of the sort discussed by Turiel, Smetana, and their colleagues is grounded in an understanding of obligation and permission more generally.

Children as young as 2 years reason appropriately about obligations. Although not yet discriminating between moral versus conventional obligations, 26-month-olds judge it would be 'bad' or 'not OK' to violate moral obligations (e.g., biting another child) and to violate conventional obligations (sitting on/off the rug for show and tell) [Smetana & Braeges, 1990]. By 3 and 4 years, children not only see these acts as disobeying obligations and hence meriting punishment and negative evaluation, they also distinguish between the two different sorts of obligations. Violating moral rules is more 'bad' and more negatively evaluated than violating conventional rules [e.g., Smetana, 1981]. Studies show appropriate distinctions between moral and conventional obligations in young children in many countries: for example, 3- to 5-year-olds in the Virgin Islands [Nucci, Turiel, & Encarnacion-Gawrych, 1983], 4-year-olds in Hong Kong [Yau & Smetana, 2003b], kindergartners in Korea [Song, Smetana, & Kim, 1987], and 3-, 5-, and 7-year-olds in Columbia [Ardila-Ray & Killen, 2001].

Indeed, by age 3–4, children reliably distinguish between issues of morality, convention, and personal choice [Nucci & Turiel, 1978; Smetana, 1981]. Not only do children as young as 3 years treat moral rules, in comparison to social conventional rules, as more serious, less revisable, and as less contextually relative, by this age, children also consider certain behaviors as in the domain of personal choice, as indicated by their judgments that individuals themselves, rather than persons in authority, should make decisions about such behavior [Nucci & Weber, 1995].

Contemporary research has focused on deontic reasoning more directly, via conditional reasoning tasks. Conditional reasoning involves 'if P then Q' deductions. Young children are typically poor at solving such problems. However, reasoning about deontic conditionals – if you go outside, you *must* wear your hat – is an area in which young children perform quite well. For example, Harris and Nunez [1996] presented children with conditionals like 'Jane's mom said, if you go outside you must wear your hat' in story scenarios. Then the child saw 4 pictures: (1) Jane

outside and wearing a hat (P, Q); (2) Jane outside and not wearing a hat (P, not-Q); (3) Jane inside and wearing a hat (not-P, Q), and (4) Jane inside and not wearing a hat (not-P, not-Q). The child was asked to choose the picture in which 'Jane was being naughty and not doing what she is supposed to do.' In a series of studies, even 3-year-olds were quite good at picking the correct picture (number 2 above: P, not-Q). In contrast, young children were poor when similar conditional rules were presented but without deontic content. For example, consider a simple, descriptive conditional. A child hears Jane say, 'When I go outside, I always wear my hat.' Then the child is shown the same 4 pictures described above and is asked to choose the picture where Jane is 'not doing what she said.' In this case, 3- and 4-year-old children performed quite poorly [Harris & Nunez, 1996; see also Cummings, 1996b].

Such deontic reasoning is evident in young children in a variety of cultures. In the Harris and Nunez research [Harris, Nunez, & Brett, 2001; Nunez & Harris, 1998], young children in Nepal and in Columbia perform similarly to those in the US and Britain.

Linking Deontic and Mentalistic Reasoning

Both deontic and belief-desire reasoning prove similarly early developing (on the same toddler-preschool trajectory) and similarly universal. A more critical question, however, concerns whether deontic and belief-desire concepts and reasoning prove intertwined in their early development. To reiterate, if we consider the relationship between children's reasoning about desires or intentions (what the person wanted or meant to do) on the one hand, and children's reasoning about moral judgments (naughtiness in violating obligations) on the other, the traditional answer was a clear no. Piaget [1932] in his early research on moral judgments in the child concluded that preschool children considered rules as heteronomous (objective and inviolable) rather than autonomous (subjective and subject to intentional violation). Similarly, he argued, preschoolers considered only objective outcomes of the act, and not subjective intentions of the actor, in evaluating the goodness and naughtiness of actors.

However, just as contemporary studies on theory of mind have overturned Piaget's conclusions that young children fail to go beyond overt behaviors and appearances to consider inner psychological states, more contemporary research on the development of moral judgments overturned Piaget's conclusions that young children fail to go beyond outcomes and overt damage to consider the actors' intentions [e.g., Siegal & Peterson, 1998; Turiel, 1983; Wimmer, Gruber, & Perner, 1984]. These data alone indicate that by 3–4 years, young children consider both obligations and intentions (or desires) in their judgments of action.

Further research looks at the interrelationship of deontic and mentalistic considerations in the assessment of individual differences. For example, children who show mature conflict resolution behavior with their siblings at 2 years of age have been found to come from families in which the mother consistently refers to *both* the feelings of the siblings and to social rules when intervening in sibling conflicts [Dunn, 1987]. Or consider individual differences in false belief understanding. Lalonde and Chandler [1995] found that whether a child is earlier or later in understanding false belief relates to differences in teachers' ratings of the child's social be-

havior, concerns, and understandings in preschool. The single largest correlation (0.45) was between false belief understandings and teachers' ratings that the child 'follows rules without being reminded.'

A different, more direct sort of data comes from studies looking at the influence of mental state factors on deontic judgments or the reverse. Recall the deontic reasoning paradigm of Harris and Nunez [1996] where young children correctly assess 'where Jane is being naughty,' given Jane's mom said 'if you go outside you must wear your hat.' In two studies, Nunez and Harris [1998] contrasted children's judgments of the focal character's naughtiness for accidental (she's outside and 'the wind's blown her hat off') versus intentional (she's outside and 'she's taken her hat off') violations of the obligation. In the first study, children in England as young as 3 years (the youngest children tested) appropriately distinguished the two cases – judging the intentional violator as naughty four times more often than the accidental violator. In the second study, children in Columbia, as young as 3 years, did likewise. As Nunez and Harris [1998] conclude, 'Because deontic rules typically apply to human agents who can deliberately renege on an obligation, an appreciation of the agent's actions, including a decision about whether an agent has or has not met a prescribed condition, calls for an interpretive stance in which agents' intentions are assessed ... a key component of theory of mind' (pp. 155–156).

Kalish [1998], however, makes a different comparison and comes to a somewhat different conclusion. He argues that following a rule, such as an obligation, is based on an intention to follow the rule *and* knowledge of the rule. In his study 3, he shows that not until about 4 years do children appreciate that someone with no knowledge of the rule has not followed the rule, regardless of his overt behavior. Thus, he suggests that there may be little connection between reasoning about rules and about minds early on, and that children may only come to connect these two sorts of understandings later in the preschool years with the advent of a representational theory of mind that includes a conception of beliefs and knowledge.

However, even Kalish [1998], in his studies 1 and 2 of the same report, presents some evidence that still younger children (3 year olds) appreciate that the actor's intentions (if not his knowledge) are important for assessing his rule-following. From the perspective we have advocated, intentional-volitional features are basic to theory of mind and to the fundamental integration of deontic constructs within belief-desire reasoning. From this perspective then, Kalish's data also serve to confirm an early overlap between obligation reasoning and theory of mind. Moreover, his data demonstrate a further developmental connection: when theory-of-mind understandings change (around 4 years) so too does reasoning about actions as conforming (or not) to rules and obligations (a connection that might underlie the correlation discovered by Lalonde and Chandler [1995]).

These data show powerful influences going from the mental-intentional to the deontic. What about the reverse direction, from the deontic to the mental-intentional? In adults, recent research has shown important influences of moral factors on mental-intentional judgments [Knobe, 2003, 2004]. For example, adult participants heard of scenarios where the chairman of the board of company X was considering a new manufacturing program. The chairman was informed that the new program would also help (or harm) the environment. The chairman said, 'I don't care at all about the environment. I just want to make as much profit as I can. Let's start the new program.' The chairman started the new program and indeed, the environment

was helped (or harmed). Then participants were asked, 'Did the chairman help (harm) the environment *intentionally*?' That is, did he bring about the environmental side effect intentionally (in one case a good side effect, in the other a bad side effect)?

Adults' judgments of whether or not the chairman brought about the environmental side effect intentionally depend crucially on whether the side effect was helpful or harmful. If it was helpful, then it is judged *not* intentional. If it was harmful, then it is judged intentional. Indeed, in an emerging number of studies, adults tend to regard morally bad (foreseen) side effects as intentional but morally good (foreseen) side effects as unintentional [Knobe, 2003, 2004; Knobe & Burra, 2000; Knobe & Mendlow, in press; Malle, 2006; Nadelhoffer, in press].

Leslie, Knobe, and Cohen [2006] term this the 'side-effect effect.' Moreover, they confirmed the side-effect effect for young children, 3-, 4- and 5-year-olds. Thus, in their studies, moral violations (i.e., violating the obligation against harm) influence childhood judgments of intentionality. And, conversely, in the Nunez and Harris research cited earlier, intentionality influences childhood judgments of morality and obligation. In sum, empirically, just as outlined in our conceptual analyses, mental-intentional understandings merge with deontic concerns and reasoning. This is demonstrable for young children as well as adults.

Reasoning about action involves not just judgments and predictions but also, crucially, explanations. In their explanations, children also provide evidence that deontic reasoning is not only early developing, just as mentalistic reasoning is, but that the two go hand in hand. Hickling and Wellman [2001] undertook content analysis of more than 120,000 utterances from the CHILDES database of the speech samples of English-speaking children, ages 2–5 years old; conversations were coded for children's psychological ('because he wants to'), biological ('because of germs'), physical ('because it got bent'), and socio-conventional ('because he's supposed to') explanations. Children's explanations for people's actions were typically social-psychological (about 70% of the time). In these explanations, children as young as 2 years placed almost identical emphasis on social-conventional factors that make reference to deontic considerations, such as interpersonal rules, cultural conventions and traditions, and on psychological factors that make reference to mentalistic considerations, such as the actor's thinking, beliefs, desires, or imagining. Equally, in these everyday explanations children consistently and insistently wove together the psychological and socio-conventional. This type of response is reflected, for example, in the request by a 2.5-year-old for his parents to let him 'watch (TV) when I want to' – a request that links the parent's granting of permission to watch TV (a deontic consideration) to the child's desire to engage in this activity (a mentalistic consideration) [Wellman et al., 2000, p. 905]. Or, a 3.5-year-old said, 'I want to obey,' linking desires and obligation. Finally, consider this explanation from a different 3.5-year-old: 'If we go camping, we should make a [our own] canoe. Then we won't have to pay, and we can ride whenever we want to.'

Cross-cultural developmental research provides further evidence that deontic considerations are linked with mentalistic considerations in understanding of the behavior of persons [Miller, 1986, 1987]. In these studies, samples of European-American and of Hindu-Indian adults and children (ages 8, 11 and 15) generated open-ended explanations of behaviors in their real-life experiences as well as provided descriptions of the nature and characteristics of persons in their social net-

works. These descriptions and explanations were coded into different response types on the basis of their content. The responses provided by the youngest age group (8-year-olds) resemble those found in the conversational results discussed above. That is, in both cultural populations, 8-year-olds gave approximately equal weight to 'states of the agent' (39%), a category encompassing primarily mentalistic content, as to 'contextual' factors (35%), a category encompassing primarily deontic content. Furthermore, among all four age groups, mentalistic and deontic considerations tended to be linked in explanation. This typical mingling of belief-desire and obligation-permission notions is illustrated in the following account given by a US 8-year-old for why another child failed to inform her mother of having accidentally broken a window: 'Cause she didn't want to get into trouble (desire – mentalistic consideration), because maybe she would have had to stay in for about a week or something' (obligation – deontic consideration) [Miller, 1986, p. 517].

Infancy

Despite the above connections, developmental data might nonetheless reveal different timetables or lack of connections at still earlier ages, in infancy. Theory of mind is now acknowledged to have deep roots in infancy. But revealing these roots has required homing in on an informative focus for research, namely infants' conception of intentional actions [e.g., Tomasello, Carpenter, Call, Behne, & Moll, 2005]. When do infants go beyond overt patterns of movement to consider the desires or intentions that underlie and shape such actions? Research demonstrates that an initial, rudimentary construal of persons in terms of internal states (intentions), rather than mere overt behavior, is evident in the first year of life. Consider an infant watching a person reach over a TV to get an object on the other side. Potentially infants might view such acts in terms of movement dynamics – an irregular circular arm motion. But even 9- and 12-month-old infants [e.g., Gergely, Nadasdy, Csibra, & Biro, 1995; Phillips & Wellman, 2005] seem to view such motions instead in intentional terms, as the person trying to get the hidden object. Still younger infants identify actions with their goal objects [Woodward, 1998].

Or consider an act that attempts but fails to accomplish some goal (e.g., hanging up a hat on a peg). By 14 and 18 months, infants view such acts in terms of the unseen goal not just the seen (unsuccessful) movements and outcomes [Meltzoff, 1995]. Thus they 'imitate' the successful (unseen) act, not what they actually saw. Likewise, at a similar young age infants distinguish between intended and accidental acts, choosing (in the appropriate circumstances) to imitate or learn from intentional but not accidental displays [Baldwin, 1991; Carpenter, Aktar, & Tomasello, 1998]. In each of these cases, potentially, infants could view such displays as overt behavioral configurations. But by 9–14 months, infants understand such displays as the external signs of inner, less obvious desires, goals, intentions. These early understandings of intentional action relate longitudinally to theory-of-mind achievements in the preschool years [Wellman, Phillips, Dunphy-Lelii, LaLonde, 2004].

If anything, our assessment of contemporary infant theory-of-mind research is conservative. Research on infants' understanding of persons increasingly shows early understanding of persons' intentional, mental states [Onishi & Baillargeon, 2005; Tomasello & Haberl, 2003] in looking-time and in action-interactive paradigms.

Do deontic notions or their precursors make similarly early appearances? Surprisingly, much less research has addressed this question, perhaps in part because research has not yet homed in on an informative focus for infant research. From the construal outlined earlier (summarized in table 1), however, obligations can be seen (in part and simplistically) as restrictions on desired actions [Wellman & Miller, 2006]. Infants' understanding of restrictions on intentional action imposed by social partners should thus provide revealing information.

Phillips, Baron-Cohen, and Rutter [1992] engaged both normally developing infants (9–18 months old) and young autistic children of comparable mental age (but 3 or so years of chronological age) in several scripted social interactions. In one task, for example, as the infant engaged in an intentional-desired action (reaching for a desired toy) the adult cupped her hands over the infant's (restricting the action). In comparison cases, the adult interacted with the infant in nonrestrictive ways (e.g., handing a new toy to the child). In the restrictive case, the vast majority of normal infants immediately looked at the adult's face. In the comparison, nonrestrictive case, they very rarely did so. Autistic children very rarely looked at the adult in either case. These data suggest that normally developing infants are aware that social restrictions (at least in the simple form of physically imposed social restrictions) can apply to intentional actions. Their response is also appropriately social (at least at first) – checking the adult's face. In contrast, autistic children, who are impaired in theory-of-mind understandings, also do not react appropriately to this social restriction (and instead treat the adult's hands as a mere physical limit).

Evidence for the emergence in infancy of certain deontic understandings is found as well in research focused on toddlers' preliminary understandings of social standards [see Kopp, 1982]. Laboratory research conducted by Kagan [1981] reveals, for example, that by 19 months children evidence an awareness of norms, as seen in their tendencies to display distress when presented with broken or dirty objects that violate conventional standards of appearance, as well as in cases in which they are unable to achieve performance goals set by adults.

Two recent studies provide additional evidence, and suggest further feasible research. Kuhlmeier, Wynn, and Bloom [2003], using looking-time methods, showed babies a movie in which one entity (the actor) tries to get up an incline. On some occasions, a second entity (the 'helper') would gently push the actor from the bottom, apparently helping it up; on other occasions, a third entity (the 'restrainer') would push the actor down from the top, seeming to thwart its intended action. Adults clearly perceive these displays as helping or restraining, but what about infants? The authors tested babies' construals by first familiarizing them to the above displays and then later showing them displays where the actor sits between the helper and the restrainer and then either approaches one or the other. Twelve-month-olds (but not younger children) looked longer if the actor approached the restrainer rather than the helper. Thus these infants seemed to expect the actor to prefer and approach the entity that helped it and avoid the one that hindered it. A reasonable interpretation of these results is that they show an emerging infant understanding of intentional restrictions versus assistance for acts.

With a different, more interactive methodology, Tomasello and colleagues explored infants' understanding of adult partners who were either 'unwilling' or 'unable' to help the infant [Behne, Carpenter, Call, & Tomasello, 2005]. Here the investigators engaged infants in a game in which an adult gave them toys across a table.

Interspersed were trials in which the adult held up a toy but did not give it over. In some cases, this was because he was unwilling, in various ways, to do so, and in other cases, it was because he was trying but unable to do so (e.g., could not extract it from a transparent container). In reaction to these activities, 9- to 18-month-olds (but not 6-month-olds) showed more signs of impatience (e.g., reaching, turning away) when the adult willfully kept the toy for himself than when he was making a good-faith effort to give it over but nonetheless also failed to give it to the infant. Infants thus seemed to have appreciated that in the 'unable' scenarios the adult was trying to give her a toy as he struggled unsuccessfully against some restriction.

Both of these studies show infant understanding of intentional action merged with understanding of (intentional) social restrictions on action. These data are far from definitive with regard to infant understanding of social responsiveness or restrictedness. Moreover, physically helping or restraining, or being willing or unwilling yet unable, are not the same as obligations (prohibiting one's desired acts) or permissions (allowing one to act as desired). But these data do show early infant understanding of certain social influences on intentional action and thus infant connections between understanding social responsiveness and intentional understanding.

In addition, these few studies suggest fertile ways to examine infant understanding of social responsiveness in general, and thus infant understanding of deontic constructs more specifically. One can easily imagine parallel studies designed to examine infant understanding of prohibition versus permission, instead of helping-hindering or unwilling-unable.

Alternative Theoretical Proposals

In contrast to our emphasis on the interconnection and integration of the mental-intentional and the social-deontic in everyday folk psychological thinking about persons, both early in development and in later life, other theoretical discussions attempt to decisively segregate these into two separate domains of understanding or modules. Here we address several of these alternative proposals.

Distinct Domains

Contemporary theorists concerned with moral development talk as if there are distinct substantive knowledge domains in which understandings of the deontic must be decisively segregated from understandings of freely chosen, autonomous actions. This segregation is apparent in discussions highlighting three 'domains' of conception: a domain focused on personal, chosen actions along with two domains of rule-governed actions, one focused on morality and the other on social convention [Nucci, 1981, 1994, 1996; Turiel, 1983, 1998]. Within this theoretical perspective, the interrelationship of domains is taken to be a matter of coordination between these quite separate knowledge structures [Turiel & Davidson, 1986]. Thus, for example, certain cases may involve 'second order' phenomena in which the violation of one type of obligation gives rise to the violation of another, such as when a conventional breach (e.g., wearing a bikini to one's father's funeral) leads to harmful consequenc-

es and thus to a moral wrong. It is also recognized that many situations are ‘mixed’ in that they encompass issues from more than one domain that may even be in conflict with each other, such as in the case of the Milgram experiment, in which the conventional demand to conform to authority conflicts with the moral demand not to engage in harm.

We challenge the discreteness of the domains assumed in this perspective, and argue that it needs to be recognized that the mentalistic and deontic – and hence the obligatory and the personally chosen – are mutually constitutive. Social inference is not based on ‘coordinating’ discrete domains of mentalistic and deontic knowledge but on understanding mentalistic and deontic meanings that are inherently inter-related. For example, in his research on moral judgment, Nucci [1981] examines children’s understanding of the personal domain by using a probe that tapes whether a given behavior is judged to be the agent’s ‘own business.’ However, such a probe not only elicits information concerning whether the behavior is being viewed as a matter of personal choice but also, simultaneously, concerning whether it involves deontic considerations. That is, endorsement of the response option that an action is the agent’s ‘own business’ carries the meaning that the action is not someone else’s business and so, in this instance, is permitted to fall outside the domains of either morality or convention. As this probe seems to make clear and as we asserted earlier in our discussion of obligations and permissions, personally chosen action is never absolute but rests on not being subject to social regulation. This integral relationship between non-rule-governed and rule-governed behavior is acknowledged implicitly in work on moral judgment when it is claimed that behavior which is socially regulated in one society or at one historical point in time may be regarded as beyond the scope of social regulation, and thus a matter of personal choice, in another society or at another historical point in time and vice versa [Nucci, 1997]. Such switching of actions from one purview to another is explicitly acknowledged in our analysis: revoking an obligation to perform an action is understood as releasing the actor who is thus now *permitted* not to perform the action, while revoking a permission to perform an action is understood as constraining the actor who is now *obliged* not to perform it.

It should be emphasized that our theoretical position does not assume that the deontic status of particular behaviors as matters of morality, social convention, or personal choice is dictated by social consensus and merely passively accepted by actors. Rather, we assume, as research in the distinct domain tradition has shown [e.g., Hasebe, Nucci, & Nucci, 2004; Milnitsky-Sapiro, Turiel, & Nucci, 2006; Nucci, 1996; Smetana, 2005], that agents may actively resist cultural messages and adopt understandings that are counter to those forwarded in their communities. When adolescents, for example, decide that whom they date is a matter of personal choice that should not be subject to the social control of their parents, they may well be resisting cultural messages to the contrary. Our claim then is not about the processes that influence whether behavior is categorized in rule-governed versus non-rule-governed terms, which we assume always involves a mixture of self-constructive processes along with social influences, but about the conceptual meaning of deontic and mentalistic categories.

This discussion highlights that the meaning of ‘domain’ differs as utilized for domain theory within the area of moral development, as compared with theorists concerned with the development of foundational knowledge structures such as naive

psychology, naive physics, and naive biology [Wellman & Gelman, 1992, 1998]. The ‘domains’ of morality, convention, and personal choice, in fact, are inherently inter-related, an insight emphasized in our present theoretical model but unarticulated within domain theory which emphasizes instead the fundamental independence of these aspects of social understanding.

Foundational Knowledge Structures, Domains, or Modules

Some theorists who take a foundational knowledge perspective on domains, as do we, attempt to segregate the mental and the deontic into two very different reasoning types. One example is encompassed by the quotes from Atran cited earlier: theory of mind or naive psychology is a separate domain, distinct from naive sociology, the former focused on intentions, desires, beliefs of individuals, the latter on deontic obligations and actions of group members. Jackendoff [1999] as well as Kalish [1998] also suggest that children’s understanding of obligations is separate from their developing theory of mind. Equally, perhaps naive psychology is definitively separate from a domain of naive morality [Harman, 1999; Hauser, in press]. Cosmides and Tooby [1994] take a similar position but propose more, still narrower domains or reasoning types.

Domain specific machinery is necessary to explain human cognitive performance ... The statistically recurrent conditions encountered during hominid evolutionary history ... selected for a set of cognitive mechanisms that were capable of solving the associated adaptive problems ... A diverse range of adaptations designed to perform a wide variety of tasks, from solicitations of assistance from one’s parents, to language acquisition, to modeling the spatial distribution of local objects, to coalition formation and cooperation, to the induction of intentions ... to avoiding incest ... to detecting cheating ... to object recognition. (pp. 85–88)

In this scheme ‘induction of intentions’ is related to (but narrower than) belief-desire reasoning as we have discussed it, and detecting cheating (someone violating an obligation) is related to (but narrower than) deontic reasoning as we have discussed that. But both are distinctively separate cognitive mechanisms designed to solve/perform distinctively different reasoning tasks.

We too advocate a domain-specific approach, but we differ from Atran or Cosmides and Tooby with regard to the nature and scope of the key domains we propose. In the case of naive, or folk psychology, the domain is ‘theory of mind’ *in the broad sense* we have characterized it, that includes mentalistic *and* deontic core constructs. When fully developed in adulthood, it encompasses and affords intention induction, cheater detection, understandings of cooperation and assistance, as well as other related reasoning (understanding beliefs, tracking the feeling states underlying emotional expressions, detecting persons’ perceptual states, and so on).

There is no agreed-upon way to firmly fix the domain boundaries of human domain-specific cognition, and thus to adjudicate differences as to the number and nature of these core domains. All one can do, as we have done above, is to advance and defend conceptual analyses based on examination of patterns of data. Note, it is important to emphasize here that human reasoning encompasses many important distinctions. Not all such distinctions define new ‘domains’ of understanding (as we just argued in the case of moral, conventional, and personal choice distinctions).

Theory-of-mind discussions, for example, characterize beliefs and desires as distinctively different mental states, and thus the sort of reasoning needed to grasp one is different, in some regards, to that needed for the other. Yet those analyses do not characterize beliefs and desires as different domains. To the contrary, almost all discussions argue that understanding of beliefs *and* desires integrate together in an important human belief-desire reasoning system that characterizes an overall mental-intentional understanding of people. Our position is that this integrated system includes deontic understandings and concerns (revolving around obligations and permissions) as well.

Leslie et al. [2006], who examined the interrelation of moral and intentional reasoning in preschoolers in studies of the side-effect effect, maintain that, nonetheless, there must be two separate domains of reasoning, theory of mind and morality, each subserved by their own domain-specific reasoning mechanisms. Then they go on to outline two possible interactions. First, a domain-specific theory-of-mind mechanism may have a parameter within it for moral valence. 'The valence of this parameter would influence judgments of purpose, but would be obtained from processes *external to theory-of-mind*, such as moral judgment' (p. 426; emphasis ours). Alternatively, there is an innate 'moral faculty.' 'Such a faculty could take in information about the situation *and the agent's mental states*' (p. 426), and then output moral determinations. In short, these authors propose two very different reasoning systems, the mental and the moral, but ones that interpenetrate in some limited ways. Our proposal is different. We propose that the relations between moral reasoning and theory-of-mind reasoning exist because both overlap, and do so around the core deontic notions of obligation and permission. Obligated/permitted actions are understood as not merely regulated but intentional, and intentional actions are understood as not merely voluntary *but* potentially subject to regulation. We, as well as Leslie and colleagues, agree that it will be crucial in future research to address these overlaps between the intentional and the deontic, and disentangle the possible hypotheses as to the nature and development of these overlaps.

Closest to our position, among contemporary alternatives, are Cummins' [2000] most recent views. Primarily she argues that human social cognition reflects our social, hierarchal heritage. In an early article, Cummins [1996a] attempted to show that deontic reasoning is privileged in human thought, reflecting a dedicated reasoning competence, shared with other primates as well, and perhaps even all social mammals. Her argument proceeded on two fronts. On the one hand, she was concerned to separate deontic reasoning from what we earlier called descriptive (and she calls indicative) reasoning. On the other hand, she argued against seeing human proficiency at deontic reasoning as reflecting the operation of a very specific social module or algorithm such as 'cheater detection.'

On the first front, Cummins reviews considerable research showing that adults and children are much better at making inferences couched in a variety of deontic contents as opposed to very similar problems couched in descriptive or indicative contents. On the second front, Cummins argues against proposals by Cosmides and Tooby [e.g., 1992, 1994] that the advantage of social reasoning over indicative reasoning is specific to a very narrow sort of social reasoning reflecting operation of a quite specific cheater detection module or algorithm. Against such a proposal, Cummins reviews research demonstrating that the social-over-indicative advantage for solving reasoning problems couched in social content is wider than cheater detection

and social exchange (i.e., it covers obligations, permissions, and so on quite widely, not just reciprocal obligations).

In short, Cummins primarily argues for a mid-level analysis of deontic reasoning: there is a key form of specifically social, deontic reasoning that is more specific than domain-general indicative reasoning, yet considerably broader than cheater detection. With this general conclusion, we agree. We too argue for early developing, culturally universal, social reasoning competences that are far wider than mere cheater detection, yet distinctively different from domain-general indicative reasoning. In our proposal, a core human social reasoning system integrates deontic *and* theory-of-mind constructs/concerns, but still qualifies as an appropriately mid-level reasoning system with regard to all Cummins' arguments.

In a more recent paper, Cummins [2000] outlines a suite of capacities evident, she argues, in human and nonhuman primate skilled interaction within their social environment. This social environment, she contends, is characterized by distinctive dominance hierarchies *as well as* clever conspecifics. Life in primate dominance hierarchies shaped the evolution of human mental capacities resulting in a collection of social cognitive traits, which includes:

- Recognizing dominance relations
- Fast-track learning of social norms (i.e., permissions, prohibitions)
- Detecting violations of social norms (cheaters)
- Monitoring reciprocal obligations
- Reading the intentions of others

[Cummins, 2000, p. 5]

With regard to humans, in particular, 'reading the intentions of others' is part and parcel of 'theory-of-mind reasoning' [Cummins, 2000, p. 10]. In these sections, where she (a) includes reading intentions and theory of mind along with detecting, monitoring, and dealing with obligations and permissions as part of the human social-cognitive ensemble, and (b) describes ways in which reasoning about social norms and obligations and reasoning about intentions and minds interpenetrate each other, Cummins' perspective and our own become quite similar. Cummins goes on to argue that this collection of capacities appear together and go together, because they are needed for, or aid in, appropriate participation in complex dominance hierarchies amid *clever* social partners. Thus, *together* they aid human evolutionary fitness (in her evolutionary 'just-so' story).

Perspectives for Future Research

A theoretical position becomes increasingly attractive to the extent that it seeds enhanced conceptual thinking and further empirical research. Theoretically, the potential contribution of our analyses to mainstream discussions of theory of mind is twofold: extending those theories to be more properly *social* cognitive, and integrating deontic notions into standard belief-desire perspectives. Mainstream accounts of theory of mind consistently contend that theory of mind provides the infrastructure for social cognition writ large: 'The claim behind "theory-of-mind" research is that certain core understandings organize and enable (our everyday) developing social perceptions, and beliefs. In particular, the claim is that our everyday understanding of persons is fundamentally mentalistic' [Wellman & Lagattuta,

2000; p. 21; see also Flavell & Miller, 1998]. But these standard accounts are essentially nonsocial, focused on the internal states of autonomous individuals. Theory of mind cannot account for all social understanding and reasoning, but it need not be so unnecessarily individualistic; it can and should be more appropriately social. But how so? We argue it can be more social – and more appropriately social – by including the deontic, and particularly the deontic notions of obligation and permission. By our analysis understanding of obligations and permissions are core to deontic reasoning but also inherently psychological-intentional. This then allows for, and requires, integrating these deontic notions into belief-desire perspectives, and into research on developing theories of mind.

Empirically, the current perspective – which attends to deontic and mentalistic considerations together – provides a platform for identifying topics for further needed research. We have already identified several such topics. For example, we earlier identified research on the development of side-effect effects as worthy of sustained empirical attention. And we argued that research on infants' understanding of deontic notions – obligations, permissions, and possible precursory forms of such understanding apparent in infants' early developing understandings of social-intentional restrictions on intentional actions – is needed and feasible. In what follows, we briefly outline two further intriguing research foci that stem from an expanded perspective, integrating deontic reasoning as fundamental to theory of mind.

Early Developmental Changes in Deontic Understandings

A mentalistic construal of persons undergoes profound change in the years from 2 to 5. Evidence cited earlier suggests that these changes correlate with increases in children's understandings of rules. Nonetheless, the data on deontic reasoning have focused more, to date, on demonstrations of early competence in 2- to 5-year-olds rather than developmental change from 2 to 5 years. The proposal that deontic and mentalistic understandings cohere together suggests that early deontic understanding, narrowly considered, should likewise and relatedly change. Here is one possibility.

When young children (e.g., 3-year-olds) explain persons' actions, they often make an intriguing error, they overapply the everyday psychological maxim that 'people do things because they want to.' Thus, even when explaining an explicitly unwanted, unintended outcome, children often insist the actor really wanted the outcome [Schult & Wellman, 1997]. Their reasoning seems to be that people act to fulfill their desires, so if their actions produced the outcome, the outcome must have been desired. A plausible interpretation of this error is that, in Searle's [1983] terms, young children overdo desires' direction of fit. In this terminology, desires have an 'upward,' world-to-mind direction of fit. That is, if I desire X and do not get it, this does not change my desire, instead the press is to change the world (typically my actions) so as to make the world fit my desire. (In contrast, beliefs have a downward, mind-to-world direction of fit. If I believe X but it is not so, the press is to change my belief to fit the world.) Young children's insistence that all persons' actions are done because 'they want to' acknowledges and overinsists on desires' direction of fit: actions are desired. (Young children's insistence, for example in false belief tasks, that a person thinks what is so acknowledges and overinsists on beliefs' direction of fit:

beliefs are true.) With increasing development in the preschool years, children more easily acknowledge that actions are at times unwanted (and beliefs at times untrue).

We predict this general transition would also be apparent in tasks more focused on deontic reasoning. Obligations (like desires) also have an upward, world-to-mind direction of fit. If I fail to discharge an obligation, the obligation does not change to fit my actions; my actions must change to fit the obligation. Authorities' communications, evaluations, and punishments attempt to enforce this direction of fit (as outlined in table 1). It seems plausible, therefore, that at a young age children will overinsist on this fit. That is, they might overapply the maxim that 'if you must, you must' (so that it becomes instead, if you have to, you necessarily will). In doing this, young children would be prone to assert that rules cannot be broken, obligations are necessarily discharged; their predictions and explanations will tend to fail to entertain the idea that obligations are at times unfulfilled. With increasing development, in the preschool years, children will more easily acknowledge that obligations are often resisted, knowingly broken, and rebelled against.

There is some initial evidence for this developmental progression. For example, in his early studies of children's understanding of the rules of games and moral reasoning Piaget noted: 'We have had occasion to see during our analysis of the rules of a game that the child begins by regarding these rules not only as obligatory, but also as inviolable' [Piaget, 1965, p. 109]. Kalish, Weissman, and Bernstein [2000] present some recent research on children's understanding of rules that includes a similar interpretation. This seems an intriguing and important candidate for further, systematic developmental research.

Later Developmental Changes in Deontic Understandings

Early childhood psychological (that is, mentalistic-deontic) understandings also serve as a platform for further more elaborate understandings. Here, our prediction is that conceptual developments will be importantly culturally variable. As we have outlined, early psychological understandings in childhood change with increasing development; thus, adults' understandings of the psychological world differ from those of young children. In addition, adults' understandings in the psychological domain show cultural variability, including, for example, different mixes of autonomous, trait-organized, and interdependent, role-organized emphases. Thus, mature psychological understandings include deontic and mentalistic emphases or endpoints. From this perspective, developmental changes would begin from basic psychological understandings in childhood that encompass an integrated mix of deontic as well as belief-desire appreciations, and then further reflect cultural variation in emphases and in the ways and degree to which particular concepts are elaborated and linked with other conceptual understandings.

This perspective underpins our predictions about the development of such notions as duties, rights, promises, and traits. In our analysis, such concepts would be later developing, and the nature of their development, although showing certain common age trends, would also be culturally diverse leading to potentially contrasting elaborations, understandings, and emphases. Consider understanding of promises. To make a promise is to obligate oneself to engage in a future intentional act.

The little data available on (English-speaking) children's understanding of promises shows that understanding this deontic-mentalistic notion unfolds slowly over the years from 5 to 11 or so [e.g., Astington, 1990; Maas & Abbeduto, 2001]. Consider the notion of traits, a construct we discussed earlier. We argued that developmental changes and cultural divergences are obvious in trait understanding in relation to social role understandings. We predict that variations should also arise and be obvious in developing notions of duty and of rights.

Although duties and rights might seem like straightforward elaborations of the core notions of obligations and permissions, respectively (indeed Jackendoff [1999] argues that the core deontic notions are obligations and rights), we argue briefly here that these notions and elaborations can vary in different cultural contexts for development. Although research indicates that concerns with individual autonomy are universal [e.g., Ardila-Rey & Killen, 2001; Helwig, Arnold, Tan, & Boyd, 2003; Yau & Smetana, 2003a] and that individuals in subordinate positions in all cultures at times perceive the power of those in authority as unfair [Turiel & Wainryb, 1998; Wainryb & Turiel, 1994], it has also been observed that certain expectations, such as perceived duties to be responsive to the needs of family and friends, tend to be more fully internalized and thus to have more positive connotations in certain cultural communities than in others. For example, Latino American college students [Janoff-Bulman & Leggatt, 2001] as well as college students from Brazil [Bontempo, Lobel, & Triandis, 1990] report experiencing greater enjoyment and satisfaction in helping family members than do European-American college students, even as they also report stronger feelings that they 'should' help. It has also been found that whereas European-American students associate less satisfaction with acting to meet social expectations to help, as compared with helping more spontaneously, Hindu-Indian college students tend to associate equal satisfaction with helping in the two types of cases [Miller & Bersoff, 1994]. Also, whereas European-American students tend to link a sense of choice only with freely given helping, Hindu-Indian students show a greater tendency to link a sense of choice also with acting to fulfill social expectations [Miller, 2003; Miller & Bersoff, 1995]. Such findings point to duty having somewhat contrasting affective and connotative meanings, with significant cultural variability existing in the tendency to conceptualize duty to family members and friends as congruent with and beneficial to, rather than in tension with, the self.

Cross-cultural work also reveals that in Hindu and Buddhist cultures, duty is linked to self-identity and to self-benefit, at least in part, through metaphysical beliefs such as *karma*, and through a view of *dharma* as simultaneously a natural, social, and spiritual code for conduct [Huebner & Garrod, 1991; Marriott, 1990; Miller, 2003; Vasudev, 1994]. Research among Japanese cultural populations, in turn, highlights a contrasting view of duty, and of its implications for self, one that gives greater weight to being a good group member [Lebra, 1976; Rothbaum, Pott, Azuma, Miyake, & Weisz, 2000; Shimizu, 2000]. For example, Japanese people draw a distinction between *honne* and *tatemae*, that is, between one's 'real' feelings and feelings that must be socially expressed or inhibited in the service of maintaining harmonious relationships. From the perspective presented here, such distinctive stances on duty reflect the development of culturally variable understandings that integrate deontic and belief-desire notions in revealingly distinctive ways.

What about the notion of permission? Consider the concept of individual rights, in contrast to the concept of privilege. The idea of individual rights is premised on

the notion of permission in that it involves a behavior being appraised as not legitimately subject to social regulation and thus allowed as an area of free choice, in which it is permissible for the actor to act in whatever way he/she chooses. The concept of individual rights tends to be invoked, in a general sense, to cover protection of the individual's general freedom from unwarranted social constraint as well as, in a more specific sense, to cover individual freedoms that have been marked by society as particularly worthy of protection. Evidence suggests that young children consider certain behaviors to be matters for personal decision making [Nucci, 1981] and that adolescents universally recognize areas of personal autonomy that they feel should not be subject to parental control [e.g., Hasebe, Nucci, & Nucci, 2004; Yau & Smetana, 2003a]. Given cultural variability in the types of issues seen as matters for personal decision-making [Miller, 2001], we would expect that the salience and degree of developmental elaboration of the concept of individual rights would also show cultural variability. Thus, for example, cross-cultural work on moral development has shown that, while both Hindu-Indian and European-American populations value helping family and friends, Hindu-Indians show a greater tendency to consider it an obligatory matter of moral duty. In contrast, European-American populations show a greater tendency to treat it as a matter for personal decision making, a trend that noticeably increases with age [Miller, Bersoff, & Harwood, 1990].

The concept of privilege (in the sense of a benefit or prerogative attached to a position or office or status, such as class privilege) is also premised on the permission schema in that it involves behavior that the agent is allowed to display by virtue of his/her social position. Privileges require knowledge of social role relationships and of the larger social order, and thus may be anticipated to be one of that set of concepts whose complexity is only gradually understood over development [Turiel, 1983]. Given the greater tendency in certain Asian and African cultures to emphasize a view of families and of other in-group relationships as based on hierarchically structured role relations rather than on relations of equality [Snarey & Keljo, 1991], we predict that concepts of privilege, in contrast to concepts of rights, would be especially salient and undergo more developmental elaboration in the context of in-group relations in such cultural contexts.

Conclusions

We hope to have outlined a more comprehensive vision of 'theory of mind,' one that encompasses a broader, more social, naive psychology. Such a vision expands the traditional territory of theory-of-mind research to partially merge the landscapes of deontic concerns and reasoning, especially as pertains to obligations and permissions, with belief-desire concerns and reasoning. Our basic grip on the psychological world includes a naive psychological conception of socially responsive intentional agents. This broadened naive psychological conception is necessary to understand the development of everyday psychology and relatedly the development of distinctive adult folk psychologies in different cultures.

To be clear, we do not claim that every social-regulatory conception has a psychological face nor that every mentalistic conception has a social-regulatory face. Consider social cognition in its entirety, a topic that encompasses, descriptively, *anything* humans know or come to know about the social world. That is, social cognition in-

cludes concepts of human actions and interactions including individual and social actions, such as walking and cooperating, social roles and relations, such as doctor and student. But it also includes social-perceptual categories and skills at faces and face recognition, such social categories as gender and race, and recognition of the specifics of typical social conventions, situations, and scripts, such as wearing hats, dining together, and eating at restaurants. Our proposal as to core naive psychological conceptions – humans’ ‘basic grip on the psychological world’ – does not attempt to account for all this social cognition. Processes of categorization, of perceptual recognition, of skill and knowledge acquisition, automatization, and socialization, among others, are also required. Social cognition is not all psychologically based [Hirschfeld, 1996, 2006]. We simply claim that much, but not all, of this vast geography of social cognition constitutes the domain of naive psychology, if properly understood as grounded in the core psychological constructs we outline. We also claim, of course, that narrower notions solely resting on belief-desire constructs (or solely on obligation-permission constructs) are insufficient to provide the needed grounding. Finally, we claim that the notions we have pinpointed are not only conceptually basic and interrelated, they are developmentally basic and interrelated – providing an early developed set of framework conceptions that constrain, but more importantly, enable a number of other developed, specific, divergent sets and forms of naive psychological cognition in adulthood. Thus, the notions we outline, we believe, are reflected in and enable further understandings of intention, emotion, abstract authority, traits, duties, promises, rights, privileges, morality, and more. As such they surface again and again in our everyday understanding and explanation of human action, life, and experience.

At its most general, our approach highlights the importance of bridging (though not completely merging) the insights of research on theory of mind with the insights of research on children’s understanding of rules, obligation, and morality. Theoretical predilections have, in the past, kept these foci separated, but in children’s folk psychologies they powerfully overlap. Moreover, our approach highlights the importance of bridging the insights of the constructivist tradition of cognitive developmental psychology, with its emphasis on the child’s active construction of knowledge, with the insights of recent work in cultural psychology, with its attention to the role of culture in affecting the course and endpoints of child development. The model that we have forwarded assumes the existence of universals in some, basic mentalistic-deontic conceptions (intentional action, desire, belief, obligation, and permission) as well as common patterns of early developmental change in such understandings. At the same time, however, our framework posits the existence of culturally variable developmental shifts in naive psychological understandings as children increasingly participate in and comprehend the distinctive understandings emphasized in their culture. Not only the developmental origins of folk psychology, but also an appropriate appreciation of the varieties of adult folk psychologies (especially recognition of ones where deontic, regulatory understanding of folk psychology are given as much overt emphasis as are autonomous individual understandings) both argue for this broadened conception.

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