

PHARMACISTS' PERCEPTIONS OF CHILDREN AND FAMILIES AS MEDICINE CONSUMERS

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As a preliminary step towards understanding and improving communications between children and their medical providers, a survey was constructed to examine pharmacists' perceptions of children and families. All 341 pharmacists currently licensed by the State of Wyoming with in-state addresses were sent the survey. Following two mailings, 195 (57%) responded, providing information about (1) the frequency and nature of pharmacists' interactions with children and families, (2) pharmacists' beliefs about children's capacities to have a responsible role in their own medication, and (3) pharmacists' training and experience with children and families. Results provided the first description of pharmacists' perceptions of children and families as medicine consumers. Commonalities and individual differences among pharmacists in communication beliefs and practices were discussed in terms of correspondence to other research on ethnotheories and implications for improving communications between health professionals and families.

Children's well-being is affected by the actions of adults who care for them, actions that stem in part from beliefs about children's capacities and limitations. Both parents and medical professionals, including physicians and pharmacists who have relatively frequent contact with the family, affect children's physical well-being. In this paper, we report a study examining one important link in the medical network affecting children – the link between pharmacists and families. Of particular interest are beliefs that pharmacists hold about the children and families they serve. In what follows, we explain the need for this research in terms of evidence bearing on children as consumers of medicine. In particular, we elaborate on the importance of understanding the beliefs of adults participating in children's care-giving networks. Ultimately, our goal is to facilitate effective communications between children, their families, and medical professionals.

CHILDREN AS MEDICINE CONSUMERS

In recent years, health care professionals have articulated the importance of gathering information about children as medicine consumers (e.g., Bush, Trakas, Sanz, Wirsing, Vaskilampi, and Prout, 1996; Perrin and Perrin, 1983). Children are especially vulnerable consumers of medicine, at risk for faulty understanding and use. For instance, Gribetz and Cronley (1987) reported that parents underdosed acetaminophen because they used the dropper provided with infant preparations when administering the children's suspension. Scott and Nordin (1980) exhibited the importance of pharmacists giving children the first dose of medication.

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Because appropriate medicine consumption is critical to children's well-being, it is desirable to understand the communication processes that lead to appropriate and inappropriate practices. One question that arises concerns who is responsible for medicating and whether everyone in the care-giving network shares assumptions about that responsibility. While parents presumably supervise much of younger children's medicine consumption, many older children (especially those with chronic afflictions such as asthma and diabetes) administer to themselves. Whether and when children can be responsible for their own medicine consumption is a matter of professional (and probably parental) controversy. In 1995, the American Academy of Pediatrics recommended that with increasing maturity children be given greater voice in health decisions, such that ultimately their consent be regarded as binding, even when their decision conflicts with parental views. Yet some professionals worry that such a recommendation is not warranted or wise (e.g., Purdy, 1992; Ross, 1997). Purdy (1992), for instance, argues (among other things) that young children have limited experience on which to base decisions. Pharmacists are arguably the professionals closest to children's medicine consumption, yet to our knowledge no extant research has addressed their views on this important issue.

A second and related question concerns whether and how health professionals communicate with their clients, children or adults, and whether or not they adjust their instructions to the developmental level of the receiver. Adequate communication about children's medication, whether to adults or children themselves, is critical to appropriate compliance. Studies indicate that inadequate information to parents about how to administer medications results in both over- and under-doses (e.g., Simon and Weinkle, 1997). Relatedly, concerns have been raised about medications that are used by adolescents without supervision, such as contraceptives, that include only written instructions geared to those with at least a high school education (e.g., Adams and Field, 1996). In a more optimistic vein, improvements in instruction, such as adding dosing demonstrations, have been shown to improve parents' administration of liquid medications (McMahon, Rimsza, and Bay, 1997). Do pharmacists, the professionals who dispense medications, communicate directly with children, and if so, do they calibrate their instructions to the developmental level of their clients? What are their beliefs about these matters? Are they satisfied that their training sufficiently enables them to communicate with children and families? Again, these questions are currently unaddressed in the literature.

WHY A DESCRIPTION OF PHARMACISTS' BELIEFS IS NEEDED

In order to develop a description of the network of communications involved in children's health decisions, we believe it is important to examine the assumptions held by all parties about each other. In particular, the beliefs of adults who care for children may impact children's well-being. As is indicated above and in accord with the patient-care pharmacy model (Cipolle, Strand, and Morley, 1998), we assume that a pharmacist is an important source of information about medication, directly or indirectly, for child patients as well as other patients. In this role, the pharmacist – like any communicator – must make assumptions about the patient (and their family), assumptions that determine the nature of communicated information (including assumptions about how concrete or complex instructions should be, how the family communicates within itself, etc.) as well as aspects of advice communicated at the same time (e.g., who should administer the medication, etc.). What assumptions do pharmacists make in their care for children and families? How do their preconceptions vary with the

child's age? Answers to these questions are critical to understanding current communication practices between pharmacists and families.

Empirical research in the areas of both developmental and cultural psychology indicates that it is both possible and profitable to characterize the conceptions that adults make about children. Several influential theoretical perspectives (e.g., Carey, 1985; Wellman, 1990) advocate conceptualizing individuals' thinking about other people in terms of attributing "naive psychological theories;" other major perspectives similarly find value in describing the world-views or general perceptions that people possess with regard to other people, finding such descriptions to be helpful in characterizing and intervening in communications and other interactions (Bronfenbrenner, 1979; Parke, 1994; Harkness and Super, 1996; Sigel, McGillicuddy-DeLisi, and Goodnow, 1992; Super and Harkness, 1982; Young, 1991). For instance, the views that parents from different cultures have concerning children (their physical and mental capacities, social role, etc.) have been shown to be largely consistent with and predictive of interactions with children. In one such study, a West African mother explained why she used toys with her child in a different way than the French mothers in the study: "We give toys [to children] to play with. You give them toys to teach, for the future. We feel that children learn better when they are older" (Rabain-Jamain, 1994, p. 303).

The assumptions that adults make about children, and how they can and should interact with others, have implications for what information is communicated to children and when (e.g., Strauss, 1993). This is surely the case for pharmacists as for others and speaks to the need to discover what general (or even idiosyncratic) perceptions these professionals have about the children and families for whom they dispense medicine and advice. With the limited aim of providing a preliminary description of pharmacists' views of children and families as medicine consumers, we conducted a survey as reported below.

METHOD

Participants. Surveys were mailed to all 341 pharmacists with in-state addresses registered to practice within the State of Wyoming. The University of Wyoming School of Pharmacy in conjunction with the State of Wyoming Board of Pharmacy provided addresses. After two mailings, 195 pharmacists responded, culminating in a 57% return rate. Demographic information is provided in Table 1.

Survey construction. Two information sources led to the construction of our survey instrument. First we reviewed extant literature regarding adults' perceptions of children. Second, we conducted 6 open-ended interviews with Wyoming pharmacists (2 in person, 4 by telephone). The open-ended interview was designed to inquire upon pharmacist's interactions with and views towards children and families.

Survey instrument. The resulting six-page survey (available upon request from the first author) queried pharmacists regarding the following five areas of interest:

1. Views towards children's and parents' compliance with medicine instructions [e.g., "How frequently do children (with their parents' assistance) fully comply with instructions for taking their medicine?"]

Table 1 Demographics

Gender (N)^a		
Females	72	(38%)
Males	117 ^b	(62%)
Age		
<i>M</i>	47.39	
<i>SD</i>	12.18	
Degree (N)		
less than BA or BS	17	(13.3%)
BA or BS	145	(74.4%)
MS	2	(1.5%)
Pharm.D	8	(4.1%)
Parents (N)		
Number of children	153	(78.5%)
<i>M</i>	2.57	
<i>SD</i>	5.45	
Date of Degree		
<i>M</i>	1975	
<i>SD</i>	12.88	

^aPercentages appear in parentheses.

^bN's may not equal total sample of 195 due to incomplete demographic information from some subjects.

2. Contact and communication with children (e.g., "In cases where children accompany their parents to the pharmacy, how often do you speak directly with the child about their medicine?")
3. Views towards children's competency as medicine consumers (e.g., "Some professionals view even 7-year-old children as people who are capable of becoming fairly 'expert' on their own medication needs and procedures, given sufficient instruction and support from adults. For instance, some children with chronic needs might be regarded in this way. Others feel that young children are not really capable of this sort of 'expertise' even with lots of teaching and help from adults. Which is closest to your own view, capable or incapable of 'expertise'?")
4. Description of the workplace (e.g., "Do you generally have enough time to spend communicating about medicines to parents and children?")
5. Education and other sources of knowledge [e.g., "During any time in college, did you receive any training or course material related to children (e.g., regarding children's ability to understand instructions)?"]

Although we were interested in learning about pharmacists' views towards children in general, we realized that a necessarily brief survey could not specifically inquire upon pharmacists' views towards children of every age. Further, asking about children in general would risk eliciting responses targeting varying unspecified ages. Therefore, for most questions (and unless otherwise indicated), pharmacists were instructed, "We realize that all people and all children are different, but please try to give your general views regarding an average 7-year-old."

Coding responses. Most questions asked participants to report their views on a 7-point Likert-type scale. For instance, participants rated the frequencies of their interactions with

children from 1 (rarely or never) to 7 (almost always). For some analyses, we elected to categorize such responses into those representing the low (1–3), middle (4), and high (5–7) ends of the scale. Other questions that did not involve Likert-type scales simply required participants to rank or endorse statements best reflecting their views.

RESULTS AND DISCUSSION

The following presentation of results contains information for all survey items.

Views towards children's and parents' compliance with their medicine instructions. Five survey questions queried pharmacists on their views on whether children (and parents) properly comply with children's medicine instructions. Overall, pharmacists viewed parents and children as competent and concerned players in ensuring the child's proper use of medicines. For instance, 63% of pharmacists reported that children almost always properly consumed their medicine, and only 10.1% reported that children rarely or never did so. When asked to rank reasons why children sometimes fail to receive adequate medicine, pharmacists on average ranked as the number one reason "parent fails to ensure the child takes the medicine (e.g., the parent forgets)." Nonetheless, 79% viewed parents as competent in ensuring their child's compliance with medicines and 90% viewed parents as being concerned about their child's medicine consumption. Further, 96.3% believed that parents generally view pharmacists as competent sources of information.

In short, pharmacists espoused the view that parents and pharmacists enjoy mutual respect and assumptions of competency. Of course, it is possible that pharmacists' responses reflected a reluctance to share more negative perceptions, but the wide range of responses across many questions discourages such an interpretation. Asked what they would do in the case of a child refusing to take medicine, 69% of the pharmacists reported they would act to change the medicine or its form. This view may have important implications for communications between pharmacists and families, perhaps encouraging such communications, and, in turn, increasing the likelihood of adequate and informed parental supervision of medication. Though not surprising, our findings could have been otherwise with important implications: If pharmacists viewed parents as largely incompetent, unconcerned, or skeptical of the pharmacist's competence, they might be less likely to engage in fruitful communication with parents. Of course, it is an empirical question whether parents share pharmacists' positive views.

Contact and communication with children. Pharmacists generally reported considerable contact with children and families. The majority (87%) claimed to fill prescriptions for children daily. When asked what percentage of children's prescriptions resulted in the child accompanying parents to the pharmacy, pharmacists reported that children accompanied parents about half the time ($M = 50.69$; $SD = 24.64$). When asked whether they communicated directly with such children, 33% of pharmacists claimed they did so most of the time, 32% reported doing so some of the time, and 35% reported they rarely communicated with the child. Some spontaneously reported special tactics for dealing with children, as exemplified in this response: "It's good to have an icebreaker for kids. I always have a stash of small bouncy balls and do a 'magic trick.' Once one has gained their attention and

confidence, giving instructions becomes much easier." A majority of pharmacists (59%) indicated a preference to communicate with both parent and child, while 39% preferred to deal solely with the parent, and 2% preferred to talk to the child. These individual differences in pharmacists' tendencies to communicate with children deserve further exploration, both in terms of pharmacists' rationales for their practice and in terms of effects on children and families as medicine consumers.

We also asked pharmacists how much information about medicines they believed physicians provided to parents and children. We reasoned that if pharmacists believe that parents and children already have all the needed information, they would be less likely to offer information. Pharmacists generally reported that physicians did not give a lot of information about medicines to parents and children. For example, 42.1% of the pharmacists reported that physicians gave little information about medicines to parents and only 3.2% believed that physicians gave a lot of information to parents. Pharmacists indicated that physicians gave even less information about medicines to children with 83.6% reporting that physicians give little information about medicines to children and only 3.1% reporting physicians give a lot of information about their medicines to children.

Within our data, we explored what factors predicted pharmacists' reported interactions with children through regression analyses. In terms of variance explanation, no strong relationships emerged. However, some suggestive relationships (significant in this sample at an alpha level of 0.05) emerged that may be worthy of further investigation.

A small but significant positive relationship was revealed between pharmacists' rating of their overall amount of experience with children and their likelihood to interact with the child, $r^2 = 0.027$, $p < 0.03$. Not surprisingly, pharmacists were more apt to report interacting with children if they also reported that they had adequate time to do so, $r^2 = 0.017$, $p < 0.05$.

Reports were mixed concerning how frequently pharmacists gave demonstrations about medicines during their interactions with children. As indicated in Table 2, pharmacists were more likely to demonstrate medication administration for infants and chronic medicine users, but less likely to give a child the first dose or to demonstrate administration in the case of acute illnesses. Regression analysis suggested that pharmacists were more apt to demonstrate as their years since graduation increased, $r^2 = 0.06$, $p < 0.001$. Not surprisingly, pharmacists who reported having adequate time for demonstrations also reported being more likely to demonstrate first doses and to demonstrate medicating an infant, $r^2 = 0.038$ and 0.017 , respectively, $p < 0.05$.

Pharmacists who reported rarely or never demonstrating medicines (to any one of the four questions on this issue, namely demonstrating the first dose, medicating an infant, for chronic medicine users, and for acute medicine users) ranked their reasons for not doing so. Ranked first was the "other" category, which, in response to open-ended follow-up questioning, included most prominently the following ideas – medicine administration is the parent's responsibility, there is no opportunity (such as in a hospital setting), demonstrations are

Table 2 Pharmacists' reports of offering first-hand demonstrations of using medicines

<i>Situation</i>	<i>Rarely/ Never</i>	<i>Sometimes</i>	<i>Almost Always</i>
Giving child first dose	67%	12%	21%
Infants	21%	18%	62%
Chronic medicine users	20%	23%	57%
Acute medicine users	75%	15%	10%

reserved for limited cases (e.g., to inhalers), a concern about legal issues and liability, and demonstrations are a novel idea to the pharmacist. Ranked second was lack of time, and third, that the parent and child simply did not expect it. This last concern, widely given by pharmacists in our sample, constitutes another issue that could be usefully addressed by future research about parental beliefs and expectations.

As with tendencies to communicate with children, pharmacists' inclinations to demonstrate medicine administration may be worthy of future study. Our data indicated a wide variety of practices that may have differential effects on family care and children's welfare. Also, with regard to both communication in general and demonstrations in particular, the effect of time constraints as perceived by pharmacists appears to be a major determinant in pharmacist-family interactions.

Views towards children's competency as medicine consumers. Pharmacists generally indicated that children should be active participants in the medication process. As shown in Table 3, the majority agreed that children should be more involved in the medicine process than what they actually are. Most pharmacists (85%) endorsed the statement that children are generally left out of the medical process and that the more involved they become, the better. Only 5.2% disagreed. One pharmacist reflected on his/her own son's diagnosis with asthma at age 3: "Even then he understood why the medicine was important and when he needed a puff. He was in charge of his inhalers himself from second grade on because he was too shy to go to the school nurse. He has never been hospitalized and we have worked together with his physician. His compliance is excellent and has continued with multiple meds for acne." However, a few pharmacists expressed rather different concerns; for example, "While I believe in including children in the process of informing them about their meds, I don't believe children should be responsible for taking their meds properly until at least age 12, if then."

Most pharmacists (80%) endorsed the statement that children want to hear their instructions, and that as children become more involved with the medication process, compliance with medication instructions increases. Although pharmacists tended to view child participation as important, the majority (62%) indicated that ultimately the parent, not the child, is responsible for ensuring medication compliance. Our survey did not reveal how explicit pharmacists are about these expectations in their communications with families, but this may be an important area for future research on such communications.

Most pharmacists (86%) viewed children as capable (with appropriate adult supervision) of some "expertise" in their own medicine use. Regression analysis revealed a relationship

Table 3 Pharmacists' ratings of how involved children are and how involved children should be

<i>Statement: child responsible for . . .</i>	<i>Level to which children should be involved</i>			<i>Level children actually are involved</i>		
	<i>Not very</i>	<i>Somewhat</i>	<i>Very</i>	<i>Not very</i>	<i>Somewhat</i>	<i>Very</i>
Taking meds on time	26%	22%	52%	74%	15%	11%
Taking correct amount of meds	41%	19%	40%	80%	12%	8%
Reminding parents	22%	19%	59%	65%	18%	17%
Choosing whether to take meds	80%	7%	6%	60%	14%	26%
Understanding reason to take meds	4%	7%	90%	46%	27%	26%
Understanding importance of taking meds	3%	9%	88%	28%	23%	28%
Taking own meds w/o parental reminder	81%	10%	9%	80%	9%	12%
Involvement in overall process	16%	14%	71%	63%	22%	15%

Table 4 Age at which children first begin to understand medication instructions

<i>Child's age</i>	<i>Percent of pharmacists endorsing each</i>
3 to 4 years old	7
5 to 7 years old	55
8 to 9 years old	25
10 to 15 years old	12
adulthood	0.5

between pharmacists' self-report of the extent of their experiences with children and the likelihood that they viewed children as capable of expertise, $r^2 = 0.019$, $p = 0.058$. When asked at which age children can first begin to understand their medication instructions, 80% of pharmacists indicated some time in the elementary school years (see Table 4). Pharmacists' estimates of that age increased in relation to how long it had been since they completed their training, $r^2 = 0.038$, $p < 0.009$.

When asked whether medication information should be presented to a child at a child's level or an adult's level, 64% of pharmacists opted for the child's level, 19% opted for the adult's level, and 17% reported somewhere between the child and adult level. Once again, the longer since pharmacists had graduated, the more likely they were to advocate presenting information at an adult level, $r^2 = 0.057$, $p < 0.001$. Such individual differences in pharmacists' assumptions about communicating with patients may be important ones to evaluate in future explorations of the effects of pharmacist-family communications. It seems likely that different responses reflect differing theories about what is appropriate for children of different ages, probably theories that are rather complex, as suggested by one pharmacist's explanation: "The amount I interact with the child depends very much on each individual situation. If the child is small I try to at least be sympathetic to their illness or encourage them that the medication will help them soon. If the child is older, I give counselling to both parent and child, but it all depends on the child."

Pharmacists were asked their opinions about the utility of distributing age-appropriate medicine informational pamphlets to children (currently pamphlets are aimed primarily at adults). Most pharmacists (81%) thought such pamphlets would be useful for children with chronic medical needs, while slightly fewer (65%) believed pamphlets would be useful for children with acute needs.

Description of the workplace. For the most part, pharmacists reported that their workplaces were operated in a manner that facilitated patient-pharmacist interactions. Asked whether there was enough time to communicate about medicines to parents and children, 75% reported usually or almost always having enough time, while 25% indicated having hardly ever enough time. Asked whether the pharmacy was set up to allow desired communication with parents and children, 62% of pharmacists indicated an adequate or well set up facility, compared to 38% who indicated their facility was set up poorly for that purpose. Table 5 provides additional information about pharmacists' responses to these and related questions. Obviously, these findings speak directly to possible ways to improve pharmacists' effectiveness via changes in their working environments.

Education and other sources of knowledge. Overall, pharmacists indicated that they felt they possessed adequate knowledge to deal with the pharmacological and pharmacotherapeutic

Table 5 Workplace and pharmacist/family communication

<i>Statement</i>	<i>Disagrees</i>	<i>Somewhat</i>	<i>Agrees</i>
Policy allows communication	12%	21%	67%
Adequate time to communicate	25%	29%	46%
Physical set-up allows communication	38%	26%	36%

needs of children. Personal experience with children (e.g., at work or at home) was most commonly ranked as the most important source of knowledge that guided pharmacists' interactions with children. One comment illustrating this reliance on personal experience was, "As a parent of an 8-year-old child, I feel that asking them to administer their own medications is inappropriate. They need to be involved in the process and should know why they need the drug and how much to take, but an adult needs to supervise and be present when the medication is taken. If the drug has a bad taste, or the child doesn't want to stop and take it, my experience has been that a child won't take the drug without adult supervision."

Asked how they determined the age of a child, 71% of the pharmacists reported they consulted computer records or simply asked directly; 25% reported using physical appearance. Although most pharmacists (90%) reported that they had not taken any college course related to child development, 82% indicated that courses in child psychology (but taught by pharmacists) that related specifically to pharmacy practice would be beneficial. Certainly language relevant to the concepts taught in developmental courses appeared in some responses, suggesting that developmental concepts, taught formally or not, affect pharmacists' practices – for example, "Our access to these children largely depends on the parents and the various developmental achievements. One 7-year-old may or may not be mature enough to grasp all necessary elements. However, most probably do. We as professionals should involve them right up to their ability because I think they may be less likely to mistake medicine for something less important than it is."

Summary. This preliminary study of pharmacists' views of children is a narrowly focused descriptive effort based on the premise that understanding individuals' perceptions, beliefs, and ethnotheories is critical to understanding their interactions and communications. Our study revealed both commonalities and differences among pharmacists in their perceptions of children and families as medicine consumers, findings that complement the results of extant research on ethnotheories and their implications for children. One commonality was the view that parents and children are important players in children's medication. In particular, the opinion that children should be more involved as they enter the elementary school years was shared by most respondents. Pharmacists' apparent willingness to assign greater responsibility for medication to school age children corresponds to the well-documented finding that adults in many societies tend to assign more responsibilities to children at this age. For example, an analysis of ethnographies from 50 cultures revealed a shared tendency to begin assigning social responsibilities to children between 5 and 7 years old (Rogoff, Sellars, Pirrotta, Fox, and White, 1975). Another commonality among pharmacists was the view that parents respected their role. To the extent that pharmacists are accurate in this perception (which cannot be assessed from these data), this finding raises the possibility that pharmacists influence parents' beliefs about their children, serving as expert sources of information as do pediatricians (Clarke-Stewart, 1978; Harkness, Super, and Keefer, 1992; Harkness, Super, Keefer, Raghavan, and Campbell, 1996; Young, 1990). Finally,

although most pharmacists in our sample had no formal training in child psychology, they mostly agreed that such courses would be beneficial, a finding that raises the possibility of a practical change in pharmacist education.

Differences among our respondents were most evident in reported beliefs and practices regarding communication with children and families. Pharmacists differed in terms of how frequently they communicated with children, with about a third claiming to do so frequently, a third claiming to do so rarely or never, and a third claiming to do so some of the time. About two-thirds preferred to talk with both the child and parents, while others preferred to talk only with parents. Pharmacists were split as to whether, when they did talk to children, children should be addressed at a child versus an adult level. Finally, pharmacists varied considerably in their reported tendencies to demonstrate medicine administration. While our preliminary study revealed no strong predictors of these individual differences, their relationships to pharmacists' reported experiences with children and time available for communication suggest a direction for future study. Also of interest was the weak but persistent cohort effect in our results, wherein time since graduation emerged as a weak predictor of communication practices. Future research should address whether variations in communication practices stem primarily from job-related practical constraints (e.g., the pharmacist cannot see the child over the counter, the pharmacist works only during school hours), from beliefs about the appropriateness and utility of addressing children [consistent with research showing a link between parental beliefs of this sort and communication with children (Bond, Belenky, Weinstock, and Cook, 1996)], or from familiarity and experience with children, as suggested in some pharmacists' responses.

The preliminary description of pharmacists' perceptions of children and families as medicine consumers provided by this study constitutes only a small step towards a better understanding of the caretaking networks of children. This study is limited in targeting only one group of professionals involved in children's care (albeit a group not yet studied). Moreover, the sample was limited to pharmacists from one American state (although virtually all those individuals were targeted). Moreover, an understanding of beliefs and communications of pharmacists is clearly but one part of a complex network. Similar efforts to describe the perspectives of children, parents, physicians, and others (e.g., teachers, daycare providers, etc.) are essential to understanding how to improve communications among these players.

Some aspects of the communication networks are currently enjoying investigation. For instance, children's conceptions have been explored on several fronts, with some studies indicating that children see themselves as quite autonomous in self-medication and also that they have some deep misunderstandings of medicines (see e.g., Aramburuzabala, 1996; Bush and Davidson, 1992). Children have indicated on survey measures that they would feel comfortable asking pharmacists questions about medicine but that they almost never do so (Menacker, Aramburuzabala, Minian, Bush, and Bibace, 1999), suggesting that intervention may be warranted in opening this line of communication. Broadly, examinations of, and eventually interventions in, actual interactions among medical professionals and children and families will be essential to improving communications. A model for these next steps is provided by Pantell and colleagues in their research on communications between parents, children, and physicians (e.g., Lewis, Pantell, and Sharp, 1991; Pantell, Stewart, Dias, Wells, and Ross, 1982). To provide optimal benefits, such efforts will need to be extended to the network that includes all health professionals who directly contact children and families.

References

- Adams, B. and Field, A. (1996) How well can adolescents comprehend contraceptive instructions? In: Proceedings of the United States Pharmacopeia Open Conference, *Children and Medicines: Information Isn't Just for Grown-Ups*, September 29–October 1, 42–48.
- Aramburuzabala, P. (1996) Children and adolescents as family members: What they know and do. In: Proceedings of the United States Pharmacopeia Open Conference *Children and Medicines: Information Isn't Just for Grown-Ups*, September 29–October 1, 42–48.
- Bond, L.A., Belenky, M.F., Weinstock, J.S. and Cook, T. (1996) Imagining and engaging one's children: Lessons from poor, rural, New England mothers. In S. Harkness and C.M. Super (Eds.), *Parents' Cultural Belief Systems: Their Origins, Expressions, And Consequences*, 467–495. New York: Guilford Press.
- Bronfenbrenner, U. (1979) *The Ecology of Human Development: Experiments by Nature and Design*, Cambridge, MA: Harvard University Press.
- Bush, P.J. and Davidson, F.R. (1992) Medicine and "drugs": What do children think? *Health Education Quarterly*, **9**, 113–128.
- Bush, P.J., Trakas, D.J., Sanz, E.J., Wirsing, R.L., Vaskilampi, T. and Prout, A. (Eds.) (1996) *Children, Medicines and Culture*, Binghamton, NY: The Haworth Press.
- Carey, S. (1985) *Conceptual Change in Childhood*, Cambridge, MA: MIT Press.
- Cipolle, R.J., Strand, L.M. and Morley, P.C. (1998) *Pharmaceutical Care Practice*, New York: McGraw-Hill.
- Clarke-Stewart, A.K. (1978) Popular primers for parents. *American Psychologist*, **33**, 359–369.
- Gribetz, G. and Cronley, S.A. (1987) Under dosing of acetaminophen by parents. *Pediatrics*, **80**, 630–633.
- Harkness, S. and Super, C.M. (Eds.) (1996) *Parents' Cultural Belief Systems: Their Origins, Expressions and Consequences*, New York: Guilford Press.
- Harkness, S., Super, C.M. and Keefer, C.H. (1992) Learning to be an American parent: How cultural models gain directive force. In: R.G. D'Andrade and C. Strauss (Eds.), *Human Motivation and Cultural Models*. New York: Cambridge University Press.
- Harkness, S., Super, C.M., Keefer, C.H., Raghavan, C.S. and Campbell, E.K. (1996) Ask the doctor: The negotiation of cultural models in American parent-pediatrician discourse. In: S. Harkness and C.M. Super (Eds.), *Parents' Cultural Belief Systems: Their Origins, Expressions, and Consequences*, (pp. 289–310). New York: Guilford Press.
- Lewis, C.C., Pantell, R.H. and Sharp, L. (1991) Increasing patient knowledge, satisfaction, and involvement: Randomized trial of a communication intervention. *Pediatrics*, **88**(2), 351–358.
- McMahon, S.R., Rimsza, M.E. and Bay, R.C. (1997) Parents can dose liquid medication accurately. *Pediatrics*, **100**(3), 330–333.
- Menacker, F., Aramburuzabala, P., Minian, N., Bush, P.J. and Bibace, R. (1999) Children and medicines: What they want to know and how they want to learn. *Journal of Social and Administrative Pharmacy*, **16**(1), 38–52.
- Pantell, R.H., Stewart, T.J., Dias, J.K., Wells, P. and Ross, A.W. (1982) Physician communication with children and parents. *Pediatrics*, **70**(3), 396–402.
- Parke, R.D. (1994) Process, paradigms, and unresolved problems: A commentary on recent advances in our understanding of children's emotions. *Merrill-Palmer-Quarterly*, **40**, 157–169.
- Perrin, E.C. and Perrin, J.M. (1983) Clinicians' assessments of children's understanding of illness. *American Journal of Diseases of Children*, **137**, 874–878.
- Purdy, L.M. (1992) *In Their Best Interest? The Case Against Equal Rights for Children*, New York: Cornell University Press.
- Rabain-Jamain (1994) Culture and early social interactions. The example of mother-infant object play in African and native French families. *European Journal of Psychology of Education*, **4**, 228–305.
- Rogoff, B., Sellars, M.J., Pirrotta, S., Fox, N. and White, S. (1975) Age assignment of roles and responsibilities to children: A cross-cultural survey. *Human Development*, **18**, 353–369.
- Ross, L.F. (1997) Health care decision making by children: Is it in their best interest? *Hastings Center Report*, **27**(6), 41–45.
- Scott, D.M. and Nordin, J.D. (1980) Pharmacist's role in projects for children and youth. *American Journal of Hospital Pharmacy*, **37**(10), 1339–1349.
- Sigel, I.E., McGillicuddy-DeLisi, A.V. and Goodnow, J.J. (Eds.) (1992) *Parental Belief Systems: The Psychological Consequences for Children*, vol. 1, Hillsdale, NJ: Erlbaum.
- Simon, H.K. and Weinkle, D.A. (1997) Over-the-counter medications: Do parents give what they intend to give? *Archives of Pediatric Adolescent Medicine*, **151**, 654–656.
- Strauss, S. (1993) Teachers' pedagogical content knowledge about children's minds and learning: Implications for teacher education. *Educational Psychologist*, **28**(3), 279–290.
- Super, C.M. and Harkness, S. (1982) The development of affect in infancy and early childhood. In: D.A. Wagner and H.W. Stevenson (Eds.), *Cultural Perspectives on Child Development*, Oxford: W.H. Freeman.
- Wellman, H.M. (1990) *The Child's Theory of Mind*, Cambridge, MA: MIT Press.

- Young, K.T. (1990) American conceptions of infant development from 1955 to 1984: What the experts are telling parents. *Child Development*, **61**, 17–28.
- Young, K.T. (1991) What parents and experts think about infants. In: F.S. Kessel, M.H. Bornstein, and A.J. Sameroff (Eds.), *Contemporary Constructions of the Child: Essays in Honor of William Kessen*. Hillsdale, N.J.: Erlbaum.