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A method to assess the organizing behaviors used in physicians' counseling of standardized parents after newborn genetic screening

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Abstract

Well-organized conversation can improve people's ability to comprehend and retain information. As part of a long-term effort to adapt Quality Improvement techniques for communication, we developed an explicit-criteria method to assess usage of three organizing behaviors (OBs): 'opening behaviors' to establish goals; 'structuring behaviors' to guide patients through conversation; and 'emphasizing behaviors' that signal a need for attention. Pairs of abstractors independently reviewed transcripts in a demonstration sample of conversations between physicians and standardized parents after newborn screening identifies carrier status for sickle cell disease. Criteria for at least one OB were identified in 50/84 transcripts (60%), including 27 with at least one opening behavior (32%), 5 with at least one structuring behavior (6%), and 38 with at least one emphasizing behavior (45%). The limited number of OBs raises concern about communication after newborn screening. Assessment and improvement of OB usage may improve understanding and allow parents to more actively participate in health care.

Keywords: communication methods; newborn genetic screening; physician-patient communication; quality improvement

1. Introduction

Organization is an important component of effective communication in health care, patient education, and in everyday conversations. The way in which speech is organized influences the degree to which audiences comprehend and retain verbal information, which may have significant implications for health care and patient education (Lucas 2001). Organized speech helps audience members to be active listeners and incorporate new information into growing mental models (Seel 2006), as well as use the new information in subsequent decision-making (Chesebro and McCroskey 2001; Thompson 1960; Titsworth 2001). Well-organized speech can also make the speaker appear more credible in the eyes of the audience (Sharp Jr and McClung 1966). When information is complicated, organization may help patients with the mental demands of simultaneously processing new information, experiencing emotions, and holding several unfamiliar concepts in mind (Morgan *et al.* 2001; Seel 2006). In contrast, disorganized speech may lead to confusion, recall problems, annoyance, or problems with the patient-provider relationship (Thompson 1960).

Although organization has been a key focus in the fields of communication and public speaking, it has not been a well-developed focus in the field of health care communication. This is unfortunate, as health care is full of highly complicated and emotionally loaded messages, many of which can have important consequences for health, well-being, and family relationships. Much of our research focuses on communication between health care providers and parents after newborn screening (NBS). Nearly every infant in the United States is screened shortly after birth for a panel of life-threatening diseases, in order to facilitate early treatment and reduce morbidity and mortality (Allen and Farrell 1996). Commonly screened diseases include sickle cell anemia, a blood disease common among African Americans, and cystic fibrosis, a lung and nutritional disease common among Caucasians but also found in other ethnic groups. When screening for genetic diseases, communication is especially

important because most abnormal results are for infants with heterozygous or 'carrier' status, a complex idea to convey to nervous parents.

This paper is part of a long-term project to develop affordable methods for assessing and improving the 'quality' of communication services provided to parents after newborn screening. Communication effectiveness in general is associated with patients' comprehension, adherence to recommended treatments, and satisfaction with care, as well as with improvement in their symptoms, outcomes, and emotional states (Cegala *et al.* 2000; DiMatteo *et al.* 1986; Elwyn *et al.* 2000; Greene *et al.* 1994; Hall *et al.* 1988; Inui *et al.* 1976; Kaplan *et al.* 1989; Levinson and Roter 1993; Orth *et al.* 1987; Robbins *et al.* 1993; Rost *et al.* 1991; Street Jr 1991). Primary care providers' communication about newborn screening has been criticized by families and public health officials because of problems like bad timing, inadequate content, and poor conduct (Ciske *et al.* 2001; M. H. Farrell *et al.* 2001).

This paper on providers' use of organizing behaviors (OBs) in communication after newborn screening is one of several that demonstrate 'communication quality indicators'. Quality indicators are quantitative, targeted variables about communication behaviors that use techniques adapted from Quality Improvement for assessment of health care on a population scale, that is, across large geographic regions. In contrast, most health care communication efforts have focused on educating individual physicians in a single institution. For example, our other communication quality indicators quantify physicians' use and timing of certain content messages (M. H. Farrell *et al.* 2009a; M. H. Farrell *et al.* 2005; La Pean and Farrell 2005), physicians' use of jargon and explanations (Deuster *et al.* 2008; M. Farrell *et al.* 2008), and assessment of understanding (M. H. Farrell and Kuruvilla 2008; M. H. Farrell *et al.* 2009b). Much of this prior work was done with convenience samples of physicians still in residency training programs, but to study use of organizing behaviors we decided to collect a sample of more experienced physicians who have graduated from residency at least two years before the time of the study.

The purpose of this study was to develop the method for reliably assessing the use of organizing behaviors in such a way that the method could be used across an entire population of physicians. Thus, the method needs to be efficient and reliable so that it can be used by abstractors trained for quality improvement, rather than health care providers or faculty members. Once population-scale methods for communication quality assurance have been demonstrated for communication after newborn screening, similar programs may be developed to address many other communication problems in health care.

2.   Methods

2.1. Development of OB taxonomy

To identify a variety of OBs for our quality indicator measures, we performed a broad review of the literature and guidelines on health care communication and public speaking (Baile *et al.* 2000; Chesebro and McCroskey 2001; Coulehan and Block 2006; Fujishin 2008; Kurtz *et al.* 1998; Ley 1988; Lipkin *et al.* 1995; Lucas 2001; Makoul 2001; Morgan *et al.* 2001; Roter and Hall 1992; Sharp Jr and McClung 1966; Silverman *et al.* 1998; Smith 2002; Titsworth 2001). We found many overlapping variants of behaviors meant to organize communication and grouped them for measurement purposes into three categories: opening behaviors, structuring behaviors and importance emphasis (Table 1). These OBs have not been specifically studied in a health care context, but they have long been described in communication studies outside of health care. Many of the OBs take advantage of a cognitive process called the 'serial position' effect, which refers to the effect of position of a piece of information and its ability to impact listener recall. Specifically, primacy and recency impact people's ability to remember concepts presented at the beginning or end of a collection or series of concepts (Glanzer and Cunitz 1966; Ley *et al.* 1973).

Table 1. *Organizing behavior categories*

Organizing behavior	Definition
Opening behaviors	Statement in which the speaker establishes goals for a conversation, or indicates that a single, specific content message will be the topic of conversation.
Structuring behaviors	Statements that guide the patient through conversation, typically by providing a list of specific content areas to be covered in the future (outline), the past (summary), or as progress is made through conversation (signposting).
Importance emphasis	A signal that the patient should pay close attention or otherwise remember a certain statement.

2.1.1. Opening behaviors

Our first category of OBs includes several techniques for establishing the goals of an upcoming conversation. A simple version of an opening behavior occurs when a provider asks a patient about his or her chief complaint. An open-ended query may be more useful than a close-ended or leading question (Coulehan and Block 2006; Kurtz *et al*. 1998; Lipkin *et al*. 1995; Makoul 2001; Morgan *et al*. 2001; Roter and Hall 1992; Silverman *et al*. 1998; Smith 2002). When patients were asked a general query such as 'What can I do for you today?' they often gave a longer and more detailed response than patients who were asked a confirmatory question like 'I understand you are having some sinus problems today?' (Heritage and Robinson 2006).

Other types of OBs included in this group were headline statements and the so-called 'warning shot'. Headline statements are useful for purpose-driven conversations like the ones in this study, in which a provider may specify a main topic for conversation, or seek to highlight a main message. In many cases, the headline includes an explicit declaration of purpose like 'I asked you here because...' or 'I have a lot of complicated information to talk about'.

The warning shot behavior is recommended for conversations involving bad news, in order to help reduce shock, gauge the patient's initial response, or focus the patient's subsequent attention (Baile *et al*. 2000; Maynard 1996). For example, physicians may say, 'I'm afraid I have some concerning news'.

A more interactive opening behavior is found in the 'agenda setting' technique, in which the provider asks the patient to identify his or her complaints and goals, one by one, and then negotiates priority for these topics versus the provider's goals (Smith 2002). When providers interrupt a patient before the patient is able to list all the concern, then the patient's main concerns may only be raised in the last few minutes of the appointment (the so-called 'doorknob complaints') (Marvel *et al*. 1999; Rhoades *et al*. 2001).

2.1.2. Structuring behaviors

The structuring behaviors group is composed of three variant OBs that we originally had considered to be separate behaviors: outlining, summarizing, and signposting. These variants serve to facilitate understanding by providing a framework to guide the patient through the conversation. For example, ordering lists of messages in a hierarchical manner is associated with two to three-fold better recall than when messages are presented in random order (Bower *et al*. 1969). Ley, Bradshaw, Eaves and Walker found that relaying information in 'labeled categories' (e.g. informing participants what kind of information they would be told and in what order) also increased recall among medical patients and healthy volunteers (Ley *et al*. 1973). We combined the three variants during pilot testing because many statements tended to meet criteria for more than one of the variants.

An outline early in conversation provides a list of topics or messages to be covered. Outlining may help patients to prepare for concepts as they arise, and place complicated messages in context with each other.

A summary near the end of conversation lists topics or messages that were covered, which may help to reinforce learning or remind the patient.

'Signposting' (Lucas 2001) refers to guidance a physician might provide about progress through a conversation. For example, a speaker might list topics already discussed ('So far we have talked about "X" and "Y"') and then mention the topic about to arise ('now we will talk about "Z"').

2.1.3. Importance emphasis

Our third category of OBs is called importance emphasis, referring to explicit statements that the patient should pay close attention or remember a specific message. For example, a physician may comment, 'the most important thing for you to know is...' or 'The bottom line is....' Importance emphasis may be especially useful in increasing understanding of concepts presented in the middle of a list of things to be learned, when many errors in recall may occur (DuBois *et al*. 1979).

2.2. Development of an explicit-criteria data dictionary

We developed an explicit-criteria data dictionary to adapt our findings from the literature review into an instrument for abstractors to use for producing communication quality indicator data from transcripts. Explicit-criteria data dictionaries define quality indicators using very detailed instructions and extensive examples, in order to minimize the need for reviewers to use subjective judgment (Allison *et al*. 2000; Ashton *et al*. 1999). The final version of data dictionary for this analysis included criteria for definite and partial versions of the three categories described in the methods section, derived over reiterative discussions between authors and pilot testing with a small number of randomly selected transcripts.

The dictionary and resulting communication quality indicator instrument followed our usual

approach of using a trichotomous scheme (definite / partial / absent) to account for differences between clear examples of a behavior and statements that did not meet the full definition but demonstrated a clear attempt at opening, structuring, or importance emphasis (Deuster *et al*. 2008; M. Farrell *et al*. 2008; M. H. Farrell *et al*. 2009a and 2009b; M. H. Farrell and Kuruvilla 2008). For example, the statement 'We have some things to talk about' was classified as an OB-1 partial, because it opened the conversation but lacked specific details about the topic of the conversation. The statement 'It's just something you need to be aware of' was classified as an OB-3 partial because it attempted to call attention to a piece of information but used indirect wording and the word 'just' to soften the effect.

2.3. *Participants and data collection*

To demonstrate use of the OB communication quality indicator, we analyzed data from a larger study of conversations by physicians practicing outside of academic settings. During this project we recruited three parallel samples of physicians who provide primary care to newborns: 37 pediatricians in Connecticut, 16 pediatricians in Wisconsin, and 31 family physicians in Wisconsin (final N=84). We reasoned that using the three samples would ensure that participants came from different training programs, and thus would have differing communication training.

Participating physicians' names and contact information were obtained from a search of the American Medical Association (AMA) Masterfile for providers who were reported working in direct patient care, had graduated from residency at least 2 years before, offered direct patient care, and had an office located in a 40 mile radius around our institutions.

Identified physicians were contacted by telephone and invited to participate at a time of their convenience. Physicians who participated listened to a brief clinical vignette about an infant found to have SCH trait status, and were asked to provide initial counseling about the abnormal results to a standardized patient posing as the infant's mother. Participants were offered $20 as gratuity for their participation, and were paid via traveler's check (Connecticut) or gift certificate (Wisconsin).

2.4. *Standardized Parent Encounter*

The transcripts analyzed in the project were of a physician counseling a standardized parent about the results of an abnormal newborn screening result. All standardized patients were women and chosen to plausibly depict the age and ethnicity of a mother of an infant with SCH. Encounters began with a simple question: 'Hello, doctor. I heard you wanted to speak with me, something about my baby's screening test result?'

The standardized parents were coached to adopt a neutral facial expression and to avoid any appearance of anxiety or other emotions. These instructions helped our analysis to focus on organizing behaviors rather than on the physicians' ability to respond to apparent confusion. The standardized parents were also coached to appear calm and to avoid any appearance of confusion. These instructions helped to eliminate variability between patient responses, in order to facilitate comparability across physicians. The standardized parents did not improvise or interject any comments during the counseling session, to maintain uniformity of subsequent transcripts for analysis. If there was a pause in conversation, the standardized parents used a neutral continuer, such as 'uh-huh'.

Recordings were transcribed, proofread for accuracy by a board-certified pediatrician, and stripped of identifying information.

2.5. *Abstraction and analyses*

To facilitate abstraction, we used a sentence diagramming procedure to parse physician speech into individual 'statements', each of which contained one subject and one predicate. The statements also allowed us to calculate timing of OBs, relative placement in conversation, and the number of concepts raised between OBs and content messages.

Two of nine independent abstractors were instructed to read each transcript statement by statement, comparing the text in the statement with entries in the explicit-criteria data dictionary. If a given statement seemed to meet criteria for more than one of the OB types, abstractors were instructed to declare opening behaviors over structuring behaviors, and both opening and structuring behaviors over importance emphases.

Abstraction data were collected using our self-developed software application, Transcript Abstraction System (TAS). TAS was modeled after the programs used by medical record reviewers in traditional Quality Improvement projects (Mainz 2003), allowing abstractors to read through transcripts statement by statement and to enter statement-specific data for each quality indicator.

Discrepancies between abstractor data were automatically resolved by a spreadsheet algorithm to avoid introduction of a third abstractor's subjective

judgment. As with some of our previous studies (Deuster *et al.* 2008; M. Farrell *et al.* 2008; M. H. Farrell *et al.* 2009a and 2009b; M. H. Farrell and Kuruvilla 2008) this algorithm allowed for merging of 'definite' and 'absent' values into a 'partial' state when an OB was not clear enough to be apparent to two abstractors. The algorithm resulted in a final status of 'definite' if the individual abstractors had entered definite, or if one had entered definite and the other entered partial. The algorithm resulted in a final status of 'partial' for all other combinations of abstractor entries except if both statements had been left blank or deliberately entered as 'absent'.

All transcripts were abstracted by two authors to assess inter-abstractor reliability. One third of abstractions were discussed afterwards to ensure quality control and consistency, following the suggestion by Feinstein (1985). Inter-abstractor reliability was calculated before merging or consensus using Cohen's kappa.

Calculations and statistical analyses were performed using Excel (Microsoft Corp., Redmond, WA) and JMP software (SAS Institute, Cary, NC). The Chi-squared test and the Wilcoxon rank sum test were used as appropriate for the type of variables being analyzed.

3. Results

Information about the combined participant sample is shown in Table 2.

Table 2. *Participant characteristics*

Characteristics	No. responding	
	n	*(%)*
Specialty		
Family medicine	31	36.9
Pediatrics	53	63.1
Gender		
Male	57	67.9
Female	27	32.1
Age (years)		
Less than 45	38	45.2
45-65	38	45.2
Greater than 65	8	9.5
Years since graduation		
10 years or less	25	29.8
11-30	39	46.4
Greater than 30	20	23.8

Across the 84 transcripts in the sample, definite criteria were identified for a total of 139 OBs, including 34 opening behaviors, 6 structuring behaviors, and 99 importance emphases. The inter-abstractor agreement for identification of OBs was 99%, but OBs were rare enough in the sample that the Cohen's κ (which corrects for coder matches due to chance) was 0.70, in an acceptable range for a demonstration project.

Overall, 50 of the 84 transcripts (60%) met definite criteria for at least one of the OB types that we had identified in our literature review. As shown in Figure 1, abstractors identified definite criteria for two of the three types of OBs in 24% of the transcripts. Another 36% of the transcripts met definite criteria for one of the OB types. None of the transcripts contained all three types of OBs.

Figure 1. *Number of organizing behavior types included in physicians' conversation*
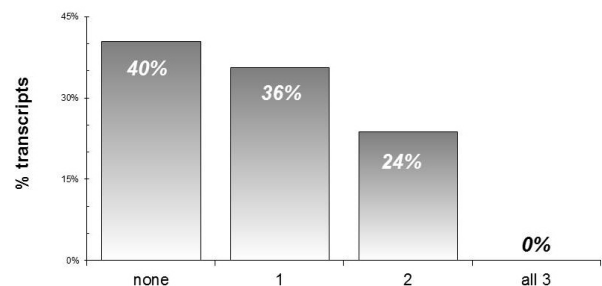
Physicians who included at least one OB were more likely to be younger in age (Wilcoxon *p*=0.023). They were also more likely to have graduated more recently from medical school (Wilcoxon *p*=0.019), although this factor will not be reported separately in the rest of the paper due to an *p*=0.97 Spearman correlation. There were no apparent differences in the overall use of OBs by physicians' gender (59.3% for females, 59.7% for males).

3.1. *Providers' use of different types of OBs*

Definite criteria for at least one opening behavior was found in 27/84 transcripts (32.1%). Physicians were more likely to include an opening behavior if they were female (52% versus 25% male, χ² *p*=.01) or if they were younger in age (Wilcoxon *p* = 0.009).

Structuring behaviors were rare in the sample, with only five transcripts (6%) meeting definite criteria for at least one. We could not detect any difference in use of structuring behavior by physician gender, age, or years since graduation.

Inclusion of importance emphasis was more common than either of the other OB types. Abstractors

identified definite criteria for at least one importance emphasis in 38/84 transcripts (45.2%). We could not detect any difference in the importance emphasis OB by physician gender, age or years since graduation.

Physicians who included an opening behavior were more likely to have included an importance emphasis, and vice versa ($\kappa = 0.24$, χ^2 $p = 0.013$).

3.2. *Effect of using partial abstraction criteria*

When abstractors' partial ratings were also counted, 432 additional OB 'attempts' were identified. Over the entire sample, when partial criteria were included, an additional 32 transcripts (38%) were found to include at least one OB, for a total of 82/84 transcripts (97.6%). Figure 2 depicts the number of OB types present in transcripts when partial criteria were counted.

Figure 2. *Effect of including partial criteria on number of organizing behavior types in physicians' conversations*
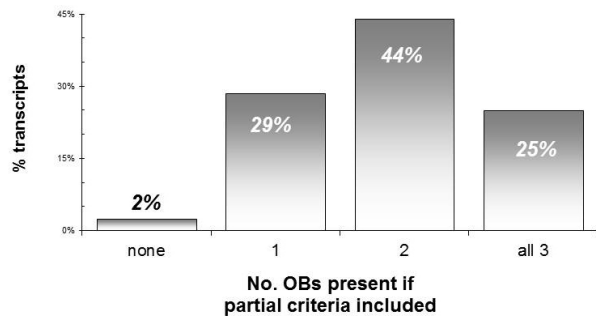
Partial-criteria importance emphases were the most common with a total of 324 identified across the entire sample. An example of a partial importance emphasis is an emphasis statement with some lessening word such as 'It's just something you need to be aware of'. The number of individual transcripts containing at least one importance emphasis increased from 38 to 79 when including partials (94.1% of the 84 transcripts).

Partial-criteria versions of the opening behavior and structuring behavior groups were also seen. When partial criteria were included, the number of transcripts with at least one opening behavior increased from 27 to 52 (total 61.9%), and the number of transcripts with at least one structuring behavior increased from 5 to 30 (total 35.7%).

3.3. *Timing of OB use in conversation*

Previous analyses have examined the timing of certain communication behaviors (M. H. Farrell *et al.* 2009b; M. H. Farrell *et al.* 2005; La Pean and Farrell 2005)

because the effectiveness of the behaviors may vary depending on when they are included. For example, outlining at the beginning of conversation or placing emphasis at the end may help physicians to take advantage of the serial positioning effect (Glanzer and Cunitz 1966; Ley *et al.* 1973).

To analyze OB timing in this sample we divided each transcript into quarters using its number of statements (see methods section). We decided to analyze both definite- and partial-criteria OBs because of the large number of the latter. The numbers of the three OB types (definite- and partial-criteria) are listed in Table 3 for each of the four quarters of the transcripts. As expected, 78% of the opening behaviors were found in the first quarter of conversation, and 11% were found in the second quarter. The small number of structuring behaviors seemed to be dispersed evenly across the transcripts. Most of the importance emphases were included later in the transcripts.

Table 3. *Timing of OB types (definite-criteria and partial-criteria included)*

Quarters (of the transcript)	Opening behavior		Structuring behavior		Importance emphasis	
	n	(%)	n	(%)	n	(%)
1st	79	(78)	15	(28)	26	(6)
2nd	11	(11)	14	(26)	101	(24)
3rd	9	(9)	15	(28)	147	(36)
4th	3	(3)	10	(18)	141	(34)

4. Discussion

The purpose of this study was to develop a method to examine the use of organizing behaviors by experienced physicians outside of academic medical centers, and was part of our long-term effort to assess the quality of communication likely to be experienced by parents after their infants are found to have an abnormal result. Communication is an important part of the newborn screening process (M. H. Farrell and Farrell 2003), and appropriate use of OBs may improve physician communication and in doing so help parents to better understand screening results.

Organizing behaviors are one facet of the communication quality indicator panel and should be considered with our other indicators: inclusion and timing of content messages (M. H. Farrell *et al.* 2005; La Pean and Farrell 2005), jargon and explanations (Deuster *et al.* 2008; M. Farrell *et al.* 2008), assessments of understanding (M. H. Farrell and Kuruvilla

2008; M. H. Farrell *et al.* 2009b) and assessment of emotional reactions (M. H. Farrell *et al.* 2012). The use of several, varied communication quality indicators in a broad panel may allow researchers and quality assessors to approach the complex concept of communication 'quality'. As with the use of quality indicators in traditional Quality Improvement, analyses can then account for specific behaviors or for high performance in one area but not in another.

The inclusion of OBs by physicians in the study was somewhat variable, even though the physicians in this sample had more experience than in our previous samples of residents (Deuster *et al.* 2008; M. Farrell *et al.* 2008; M. H. Farrell *et al.* 2009a and 2009b; M. H. Farrell and Kuruvilla 2008; M. H. Farrell *et al.* 2005; M. H. Farrell *et al.* 2012; La Pean and Farrell 2005). Though the use of OBs was not consistent, we were encouraged that many physicians seemed to be attempting to use at least one OB in counseling. We interpret the larger number of partial-criteria OBs as a sign that many physicians may recognize the importance of organization for patient understanding, even if they lack skill in effective use of OBs. Indeed, our finding that younger physicians included more definite-criteria OBs than their older colleagues may be consistent with the past two decades' greater emphasis on communication training. It is worth noting that the number of opening behaviors might have been low for this sample because of the artificial nature of the counseling task. It is also worth noting that perhaps physicians did not use the behaviors, specifically the structuring behavior (OB-2) because they did not deem the behavior useful in this context. Regardless of these factors, however, the overall scarcity of OBs seems to underscore both a need for increased teaching about OBs during medical training and a need for increased attention to communication quality after graduation.

Developing an explicit-criteria data dictionary for analyzing OBs was somewhat more of a challenge than we had experienced with our previous analyses of content messages (M. H. Farrell *et al.* 2005; La Pean and Farrell 2005), jargon (Deuster *et al.* 2008; M. Farrell *et al.* 2008), and assessment of understanding (M. H. Farrell and Kuruvilla 2008; M. H. Farrell *et al.* 2009b). One reason why our inter-abstractor reliability may have been less robust than for other studies could be that OB usage was rare, which increases the effect of correction for chance. We are also interested in exploring use of more detailed examples in the data dictionary, which may help to address cross-category overlap inherent to the OB construct. Future research with our statewide sample of primary care providers of actual infants with SCH trait is focusing on improving reliability and incorporation of the OB communication quality indicator into prospective interventions (M. H. Farrell *et al.* 2011).

4.1. Limitations

This analysis was limited by its small sample size and in future projects we will apply this method to a larger population. Qualitative methods might have provided a richer description of organizing strategies within a two-way dialog, but qualitative methods have limited reliability and would be prohibitively expensive for use in population-scale quality improvement projects. There may be other indicators of organizing behaviors that we could not integrate into this simplified, quality-improvement approach. We adapted our quantitative, somewhat reductionist, approach of using quality indicators from Quality Improvement (Deuster *et al.* 2008; M. Farrell *et al.* 2008; M. H. Farrell *et al.* 2009; M. H. Farrell and Kuruvilla 2008; M. H. Farrell *et al.* 2005; M. H. Farrell *et al.* 2012; La Pean and Farrell 2005) because of that field's track record for changing physician behavior across entire geographic regions (Jencks *et al.* 2003). This population scale approach is most effective because physicians can develop communication problems long after training and far away from the academic centers where many received training in communication.

Another potential limitation is the use of standardized patients instead of real patients, although we see this as a benefit for population-scale efforts because it avoids logistical and privacy difficulties that would make quality improvement activities difficult. Simulation allows an equal-footing comparison that would be impossible with real patients because of variations across actual patients. Simulation is also useful because a sense of observation prompts physicians to perform as well as they are can; the resulting competence data suggests a likely ceiling for the physician's processes of communication because competence is necessary but not sufficient for real-world performance (Miller 1990). We realize, however, that physicians may wish to change their communication behavior in response to patients' or parents' reactions during the actual counseling session. In the future, we hope to use these communication quality measures with transcripts of actual physician-patient encounters.

4.2. Implications

The limitations notwithstanding, we see three implications of the method developed for this project. First, given the literature available on how

the placement of messages can potentially impact patient understanding (Bower *et al.* 1969; DuBois *et al.* 1979; Ley *et al.* 1973), it is reasonable to consider that the use of communication strategies like OBs may be associated with greater effectiveness of communication after newborn screening, and potentially with improvements in parents' understanding and psychosocial outcomes. Individual providers should be aware of the potential importance of organization, but also conscious of the likelihood that they, like the physicians in this sample, may not be using OBs as optimally as they should.

Second, if our findings about OB use are generalizable, then we may have identified one of the factors that contribute to parents' misunderstandings of physician counseling. We hope that this study will prompt greater examination of the use of OBs in training programs for communication skills. Future research will also examine the role of the timing of the organizing behaviors. Behaviors were evenly dispersed in this sample and future research will consider the effectiveness of these behaviors in relation to placement in the conversation.

In the future, we plan to continue assessment of how communication behaviors affect parent outcomes and perhaps incorporate OBs into our growing, population-scale method toolkit for assessing and improving physician communication quality. We are in the process of collecting data for a comparison study in which we will be able to compare physician communication quality indicator data, including OBs, and parent reported outcomes of anxiety and understanding of results. Though there are many studies which suggest a link between subjective assessments of physician communication and positive patient outcomes (Cegala *et al.* 2000; Clever *et al.* 2008; Kaplan *et al.* 1989; Ong *et al.* 1995; Stewart *et al.* 2000), the ultimate goal of this body of research is to demonstrate a method for reliably assessing discrete physician behaviors that make a profound difference in parent and patient understanding.

Acknowledgement

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