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## Narrative comments about pediatric inpatient experiences yield substantial information beyond answers to closed-ended CAHPS survey questions

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### Abstract

**Purpose:** Adults' comments on patient experience surveys explain variation in provider ratings, with negative comments providing more actionable information than positive comments. We investigate if narrative comments on the Consumer Assessment of Healthcare Providers and Systems (CAHPS<sup>®</sup>) survey of inpatient pediatric care (Child HCAHPS) account for global perceptions of the hospital beyond that explained by reports about specific aspects of care.

**Methods:** We analyzed 545 comments from 927 Child HCAHPS surveys completed by parents and guardians of hospitalized children with at least a 24-h hospital stay from July 2017 to December 2020 at an urban children's hospital. Comments were coded for valence (positive/negative/mixed) and actionability and used to predict Overall Hospital Rating and Willingness to Recommend the Hospital along with Child HCAHPS composite scores.

**Results:** Comments were provided more often by White and more educated respondents. Negative comments and greater actionability of comments were significantly associated with Child HCAHPS global rating measures, controlling for responses to closed-ended questions,

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Declaration of competing interest

None.

Ethical considerations

Study protocols were approved by RAND's Human Subjects Protection Committee (IRB\_Assurance\_No: FWA00003425; IRB Number: IRB00000051).

CRedit authorship contribution statement

**Denise D. Quigley:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Funding acquisition, Data curation, Conceptualization. **Marc N. Elliott:** Writing – review & editing, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Mary E. Slaughter:** Formal analysis, Data curation, Writing – review & editing, Writing – original draft. **Carlos Lerner:** Writing – review & editing, Formal analysis. **Ron D. Hays:** Writing – review & editing, Supervision, Funding acquisition.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.pedn.2024.02.016>.

and child and respondent characteristics. Each explained an additional 8% of the variance in respondents' overall hospital ratings and an additional 5% in their willingness to recommend the hospital.

**Conclusions:** Child HCAHPS narrative comment data provide significant additional information about what is important to parents and guardians during inpatient pediatric care beyond closed-ended composites.

**Practice implications:** Quality improvement efforts should include a review of narrative comments alongside closed-ended responses to help identify ways to improve inpatient care experiences. To promote health equity, comments should be encouraged for racial-and-ethnic minority patients and those with less educational attainment.

### Keywords

Quality improvement; Patient experience; Inpatient care; Pediatric care; Narrative comment data

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### Background

Open-ended questions on patient experience surveys invite patients and families to add, in their own words, information about their care experiences (Grob et al., 2019; Huppertz & Smith, 2014; Maliski & Litwin, 2007; O’Cathain & Thomas, 2004). Evidence from adult patient experience surveys about inpatient care shows the value of these comments for quality improvement (Riiskjaer et al., 2012). Narrative comments help providers better understand the types of problems faced by different patient groups, which can help them develop hospital improvement initiatives (Iversen et al., 2014). Narrative comments on the Consumer Assessment of Healthcare Providers and Systems (CAHPS®) survey of inpatient pediatric care (Child HCAHPS) in response to an open-ended question about inpatient pediatric care are designed to be actionable for quality improvements (Grob et al., 2019; Martino et al., 2017; Tsianakas et al., 2012). That is, these comments provide specific details about at least some aspects of “when,” “where,” “who,” “how,” or “what,” making it possible to change problematic practices or to identify and encourage effective ones (Grob et al., 2019; Huppertz & Smith, 2014; Pedersen, 2016; Riiskjaer et al., 2012; Schlesinger et al., 2015; Wiseman et al., 2015). Negative comments from adults about their own care are more actionable than positive ones and can be useful in improving patient care (Baldie et al., 2018; David, 2013; Friedberg et al., 2011; Geissler et al., 2013; Grob et al., 2019; Huppertz & Smith, 2014; Quigley & Predmore, 2022; Quigley & Predmore, 2023; Tsianakas et al., 2012). Hence, there is increasing demand for incorporating narrative data from patient experience surveys into quality improvement efforts (Ahmed et al., 2020; Quigley, Slaughter, et al., 2021).

Narrative comments have been shown to explain variation in primary care provider ratings beyond that accounted for by closed-ended questions and may also differ for sicker and healthier patients (Grob et al., 2019; Martino et al., 2017; Tsianakas et al., 2012). To date, research has not explored whether comments from parents and guardians about their child’s inpatient care are associated with closed-ended responses, and whether they provide unique information about global ratings of inpatient pediatric care. We examined: (1) how much

information is provided by comments on the closed-ended Child HCAHPS survey measures, (2) which types of comments provide additional information, (3) whether patient experience differs for those who provide a narrative comment, and (4) whether patient experience varies by the type of comment.

## Methods

### Survey Data.

In July 2017, a 131-bed children's hospital with two facilities within an academic medical center began administering the Child HCAHPS survey (Feng et al., 2020; Toomey et al., 2015) by mail in English and Spanish to parents or guardians of hospitalized children. We obtained de-identified closed-ended and narrative data from these surveys through 12/2020 (927 respondents with 545 (59%) providing narrative comments; the survey response rate was 10–11% each year).

The Child HCAHPS survey includes 18 measures from closed-ended survey questions: two global ratings (overall hospital rating, willingness to recommend), ten domain-level composites, and six domain-level single items. We calculated top-box scores using the most positive responses (i.e., “always,” “yes, definitely,” 9 or 10 on the overall hospital rating's 11-point scale) (Toomey et al., 2015) averaged across all items within a measure and transformed linearly to a 0 to 100 possible range. The survey also collected information on the child's overall health (reported by respondent) and respondent's education level, age, preferred language, and relationship to child. The survey included an open-ended question, “Is there anything else you would like to say about the care your child received during this hospital stay?”

### Qualitative Coding.

We coded the content and actionability of the comments; details of the coding methods, including the coding process, codebook development, code descriptions, and illustrative examples appear elsewhere (Quigley & Predmore, 2022). We developed initial codes based on our objective of examining the valence, content and actionability of the comments and the content of the Child HCAHPS survey, and then added codes that emerged from the comments. Codes either addressed a survey item or pointed to content that was not specific to survey items. For example, Child HCAHPS items refer to different aspects of patient-provider communication, so we created codes for each of these. The Child HCAHPS survey does not contain any assessment of the friendliness or caring nature of a provider, so when this topic was mentioned, we created a non-Child HCAHPS code; we did this for each emerging topic. We performed directed content analysis using current research as a guide to establish our initial codes (Hsieh & Shannon, 2005) and conventional content analysis to identify codes to cover content not captured by the Child HCAHPS survey (Bernard & Ryan, 2010; Bradley et al., 2007; Cavanagh, 1997; Downe-Wamboldt, 1992; Kondracki et al., 2002).

## Analysis.

Following Toomey et al., we used the child's general health and respondent's age, education, preferred language, and relationship to child as case-mix adjustment (CMA) variables. Child's specific age was not collected but the survey asked whether the child was 13 years of age or older. The model also included facility location intercepts. Missingness for these variables ranged from 2.0% to 4.3%. We used hospital-specific mean imputation for missing values, including proportions for categorical variables.

To determine how much additional information was provided by comments to the closed-ended survey questions, we assessed the proportion of variance explained by the comment data, corresponding to the increase in  $R^2$  across models attributable to comment characteristics. We fit linear regression models separately for each of the global measures (scored on a 0–100 possible range) as dependent variables. In addition to the CMA variables, we collapsed the 10 composite measures and 6 single item measures into 4 groups (*communication with parent, communication with child, attention to safety and comfort, and hospital environment*) as done previously by Toomey et al. (2015). *Communication with child* was dependent on three screener questions related to the child's age or ability to talk, therefore, to include the full sample in our analysis, we also included indicator variables for these screener questions: whether the child was born in the hospital (during the visit for which the Child HCAHPS survey was completed), could talk about their care, or whether the child was 13 years of age or older at the time of the visit. Missingness for these screener questions ranged from 1.2% to 5.9% and for the four composite groupings from 0.4% to 5.9%. We used hospital-level means to impute missing values for these variables.

To assess the types of comments that provide additional information, we calculated the additional variance explained for each comment indicator(s) by taking the difference in  $R^2$  between a base model that included CMA, communication with the parent, communication with the child, attention to safety and comfort, and the hospital environment patient experience composite groups, and three screener indicators versus a model that added comment indicator(s). To determine whether to model valence additively, we fit a case-mix adjusted linear regression model for each measure, with indicators for positive valence, negative valence, and an interaction term between the positive- and negative-valence indicators. The associated  $p$ -value for the interaction term was not significant across 17 of the 18 domain composites, indicating that valence was best modeled additively. We therefore used indicator variables for whether a comment contained any positive or any negative information (0 = no, 1 = yes), coding the 58 mixed comments as 1 for both indicators. We included all 927 survey respondents and assessed changes in the  $R^2$  in five models that control for different sets of comment indicators: 1) any comment, 2) comment valence (positive or negative), 3) content (HCAHPS or non-HCAHPS), 4) actionability (at provider and organization level), and 5) a model that included both comment valence and actionability indicators.

To assess the extent to which the specific type of comment was associated with the two global measures beyond the established composites and single-item measures, we fit additional similar models for the 545 respondents who provided a comment and examined the  $R^2$  after a single comment indicator was added. We obtained beta coefficients and

standard errors for comment indicators and performed a Hochberg adjustment to the F-test p-values to account for testing multiple models.

To examine our third research question about whether patient experience differs for those who do and do not provide a comment, we fit separate linear regression models for each of the 18 top-box scores (scored 0 to 100) with CMA variables and an indicator variable for whether a respondent provided “any comment” to obtain adjusted means for the 18 Child HCAHPS top-box scores for those who did and did not provide a comment. Differences of one, three, and five points for CAHPS measures are considered small, medium, and large, respectively (Quigley et al., 2018).

To address our fourth research question, we fit similar models to assess whether patient experience differs by the type of comment provided. In these models we removed the indicator for having any comment but included two indicators for respondents providing any positive comment or any negative comment, using only data from those who commented. We calculated adjusted means and standard errors from these models. We also assessed the relationship between comment actionability (i.e., whether the comment was deemed actionable and, if so, at the provider-level, organization-level, or both) and the 18 Child HCAHPS top-box scores. Like the models assessing comment valence, we first fit models with an interaction term between provider-level and organization-level actionability to determine whether an additive or multiplicative model was the best fit to the data. We calculated adjusted means for actionability using the more parsimonious model. To account for multiple testing, we used a Hochberg adjustment to the  $p$ -values for each test. For example, for the  $t$ -test comparing measures among those respondents who provided a comment with those who did not, we adjusted  $p$ -values to account for the similar test across the 18 separate models (one for each measure).

We conducted all analyses using R version 4.2.1. Study protocols were approved by our Human Subjects Protection Committee (IRB\_Assurance\_No: FWA00003425; IRB Number: IRB00000051).

## Results

### Patient and Respondent Characteristics.

Table 1 compares characteristics of those who did ( $n = 545$ ) and did not ( $n = 382$ ) provide a comment. Child’s general health was not associated with providing a comment, but respondent’s race and ethnicity, age, education level, preferred language at home, and relationship to the patient/child were, with comments increasing from 28% to 67% as education increased.

### Extent Comments Provide Additional Information.

Tables 2 and 3 present the results of regression models predicting *Overall Rating of the Hospital* and *Willingness to Recommend the Hospital* (both on a 0–100 scale). The base model in both tables includes case-mix adjustors, four overarching means representing Child HCAHPS composites, and three indicators of whether the child was born at the hospital, able to talk about their care, or was 13 years of age or older. The models in Table 2

include all survey respondents and examine the changes in variance explained for five models that build from the base model. The base model accounted for 41% of the variance in *Overall Rating* and 34% of the variance in *Willingness to Recommend*. Having any comment or providing specific information about the main coded content of the comment (any comment,  $n = 545$ ) had negligible impacts on the variance ( $\sim 1\%$ ) explained. Adding comment indicators for valence (any positive,  $n = 395$ ; any negative,  $n = 235$ ) (Model 2) or actionability (actionable at provider level,  $n = 112$ ; actionable at organization level,  $n = 156$ ) (Model 4) explained an additional 8% variance for *Overall Rating* and 5% for *Willingness to Recommend*. The additional variance explained in Model 2 was largely driven by the indicator for any negative comment, which was associated with a 10-point decrease in both measures. In Model 4, actionability coefficients were  $-7.5$  and  $-9.3$ , suggesting both are important. In Model 5, which includes both comment valence and actionability indicators, the estimated coefficient for having a negative comment was only  $-2.8$ . This reflects a notable correlation between actionability and having a negative comment. The magnitudes of the actionability indicators are only slightly lower in model 5 than in model 4. In model 5 an additional 10% of the variance was explained for *Overall Rating* and 7% for *Willingness to Recommend*, 2% more than with valence or actionability alone. Thus, there was evidence of a statistically significant contribution of actionability (at the provider and at the organizational level) beyond valence and of positive valence beyond actionability.

#### **Extent Specific Comment Types Drive Global Ratings among Those Who Comment.**

In Table 3, models were fit to understand the individual contribution in explained variance for each comment indicator, among those who provided a comment ( $N = 545$ ). The base models in Table 3 accounted for 48% of the variance in *Overall Rating* and 43% of the variance in *Willingness to Recommend*. The comment indicator for any positive comment absorbed the most additional variance: 7% for both *Overall Rating* and *Willingness to Recommend*. Having any negative comment or having a comment that was actionable at the organization-level explained an additional 4% of the variance for *Overall Rating* and 3% for *Willingness to Recommend*. Positive comments were associated with a 13-point increase in *Overall Rating* (F-stat = 85.7, one degree of freedom, adjusted  $p$ -value = 0.001) and a 15-point increase in *Willingness to Recommend* (F-ratio = 75.4, one degree of freedom, adjusted  $p$ -value = 0.001). Comments deemed negative or actionable at the organization level were associated with a drop of eight to nine points (large change) for both global rating measures, with all F-tests having adjusted  $p$ -values  $< 0.001$ .

#### **Patient Experience by Whether Respondent Provided a Comment and By Comment Type.**

Those who provided a comment had significantly lower (worse) top-box scores for the *Overall Rating* (diff =  $-8.6$ , adjusted  $p$ -value = 0.03) than those who did not provide a comment. All 18 Child HCAHPS measures were significantly more positive among respondents who provided any positive comment compared to those who provided any negative comment, with differences in top-box scores ranging from 12.1 to 35.3. Supplemental Table 1 presents the case-mix adjusted Child HCAHPS mean top-box scores for respondents by whether they provided a comment and by positive or negative comment. Similar results were found comparing adjusted CAHPS mean top-box scores on measures for actionable and non-actionable comments (See Supplemental Table 2).



Among respondents who provided a comment, those providing actionable comments had more negative scores across all 18 measures than did those who did not. Similar results were obtained when using linear mean score measures rather than top-box measures as the dependent variable (results not shown).

## Discussion

This research is novel because it explores whether comments from parents and guardians about their child's inpatient care (as opposed to comments from adult patients about their own care) are associated with closed-ended responses, and whether they provide unique information about global ratings of inpatient pediatric care. Open-ended narrative comments on the Child HCAHPS survey, as with other patient experience surveys, provide detailed information about care experiences not captured by closed-ended survey items (Pedersen, 2016; Quigley et al., 2015; Quigley & Predmore, 2022; Quigley & Predmore, 2023; Quigley, Qureshi, et al., 2021; Riiskjaer et al., 2012; Schlesinger et al., 2015). We found that 59% of parents provide comments; among those who provided comments, 72% provide positive comments, 43% negative comments, and 40% actionable comments. These patterns of comment valence and actionability are similar to those observed in other pediatric settings (Ahmed et al., 2020; Quigley, Slaughter, et al., 2021), underscoring that narrative comments consistently have characteristics that make them useful for actions to improve pediatric care experiences. These findings fill an important gap in the literature on patient experience with pediatric inpatient care.

Comments on patient experience surveys provided by adults concerning their own care help explain variation in provider ratings in primary care (Martino et al., 2017). Our findings add to this evidence by quantifying the added value of the content provided (i.e., variation explained) in the narrative text provided by parents and guardians in response to the open-ended questions about inpatient pediatric care. Providing any comment or only commenting on specific experience details explained 1–3% of variance in both Child HCAHPS global measures, with those commenting having moderately worse experiences than others. Also, we found that the valence and actionability of comments on the Child HCAHPS survey were each both independently associated with parents' overall appraisals of their child's care beyond what is captured by their responses to Child HCAHPS closed-ended questions. This suggests that the narrative comments are rich for understanding the types of problems faced by different patient groups, which could in turn help to target improvement initiatives.

Considering a comment's valence or actionability added much more information, explaining an additional 8% of the variance for *Overall Rating* and an additional 5% for *Willingness to Recommend*. This additional variance explained by the valence of the comment was largely driven by negative comments. The additional variance explained by the actionability also had similar, large magnitudes and was driven by actions needed at both the provider-level and organizational-level. Both valence and actionability are important in capturing additional variance over and above what is known from the closed-ended survey items on the Child HCAHPS survey.



Future research that could replicate these analyses using a larger data set (i.e., Child HCAHPS surveys with at least 200 comments coded to each specific coded content category, such as communication with child's nurse), would make it possible to assess whether comments about specific content provide more added value than the associated Child HCAHPS composite score. Such research would help hospital leaders decide whether to prioritize coding of comment data for specific QI opportunities related to improving specified Child HCAHPS measures.

### Practice implications

Our study demonstrates the ease of collecting comments from parents and guardians about inpatient pediatric care by including open-ended questions to experience surveys and the important contribution that open-ended responses can make. Given the substantial overlap between comments that are negative and actionable, and the relative ease of identifying negative comments, a good first step for quality improvement for hospital leaders and managers is to focus on negative comments (i.e., content, common patterns, etc.) for identifying actions and issues for quality improvement. Our findings also suggest that the comments add actionable input for both provider-level and organizational level changes. Further value can be gleaned from positive comments and actionable comments, where resources allow.

Most organizations as part of their vendor contracts learn from their vendor whether a comment is negative, positive, or both. Such sorting can triage comments for different uses, such as improving deficiencies. This can reduce the volume of comments that must be reviewed. Comments reviewed and deemed actionable provide additional information beyond closed-ended data. Our results highlight the importance of sorting by valence and identifying comments that are actionable, given they provide additional perspectives not captured in the composites. However, because mean scores on Child HCAHPS global measures are high (here >90/100), the potential for positive comments to predict large increases in global measures may be limited.

Comments were provided more often from White respondents and those with higher educational attainment. This suggests that organizations concerned about health equity may wish to encourage comments from racial and ethnic minority caregivers and those with less educational attainment (e.g., engaging with parent and family advisory councils or conducting targeted outreach calls), in addition to examining comments by race/ethnicity, language, and education. Further approaches that consider system-level (rather than patient-level) causes of limited response should be investigated (e.g., are there issues of health literacy or is there a lack of trust in the confidentiality of the survey responses). Researchers could also develop protocols for eliciting narratives from a more diverse set of respondents.

### Limitations

Our study has limitations. Our sample may not be representative of other hospitals. We were not able to compare the demographics of respondents who completed the survey or who provided comments with the general patient population. The Child HCAHPS response rate was 10–11% and may not represent all patients served. Nevertheless, our analysis provides

insight into the content and patterns of the comments on the Child HCAHPS survey. Our findings indicate that health care organizations can learn more about patient experiences when survey respondents provide narrative text.

## Conclusion

This study shows that narrative comments provide important information about the experiences of inpatient care provided to children. Child HCAHPS survey narrative data should be used routinely along with closed-ended responses to obtain the most complete picture of pediatric inpatient care experiences. Their use can help hospitals prioritize actions likely to improve practice and quality of care at the institution and provider level.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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**Table 1**

Patient Characteristics, Overall and By Whether Respondent Provided Comment.

Characteristic	Overall N = 927 <sup>a</sup>	No Comment N = 382	Any Comment N = 545	p-value <sup>b</sup>
<b>Child Characteristics</b>				
Overall health				0.2
Excellent	38% (351)	38% (147)	37% (204)	
Very good	30% (282)	32% (121)	30% (161)	
Good	19% (175)	18% (70)	19% (105)	
Fair	8.4% (78)	8.9% (34)	8.1% (44)	
Poor	2.9% (27)	1.3% (5)	4.0% (22)	
Unknown	1.5% (14)	1.3% (5)	1.7% (9)	
<b>Respondent Characteristics</b>				
<b>Race/ethnicity</b>				
Hispanic	36% (332)	41% (156)	32% (176)	<b>0.003</b>
White	41% (382)	34% (128)	47% (254)	
Black	3.6% (33)	3.7% (14)	3.5% (19)	
Asian	9.4% (87)	10% (39)	8.8% (48)	
Multiracial	7.6% (70)	8.9% (34)	6.6% (36)	
Other race	0.8% (7)	0.8% (3)	0.7% (4)	
Unknown	1.7% (16)	2.1% (8)	1.5% (8)	
<b>Age</b>				
24 years of age or younger	4.3% (40)	6.8% (26)	2.6% (14)	<b>0.008</b>
25–34 years old	20% (189)	21% (79)	20% (110)	
35–44 years old	44% (407)	40% (152)	47% (255)	
45–54 years old	24% (218)	23% (88)	24% (130)	
55 years of age or older	6.7% (62)	8.1% (31)	5.7% (31)	
Unknown	1.2% (11)	1.6% (6)	0.9% (5)	
<b>Highest level of education</b>				
Less than 8th grade	5.0% (46)	8.6% (33)	2.4% (13)	<b>&lt;0.001</b>
Some high school	3.8% (35)	5.5% (21)	2.6% (14)	
High school degree	8.8% (82)	12% (44)	7.0% (38)	

Characteristic	Overall N = 927 <sup>a</sup>	No Comment N = 382	Any Comment N = 545	p-value <sup>b</sup>
Some college	17% (162)	14% (54)	20% (108)	
4-year college degree	27% (248)	24% (92)	29% (156)	
>4-years college	37% (342)	34% (129)	39% (213)	
Unknown	1.3% (12)	2.4% (9)	0.6% (3)	
Preferred language				<0.001
English	84% (778)	76% (292)	89% (486)	
Spanish	11% (103)	16% (62)	7.5% (41)	
Other	1.5% (14)	2.1% (8)	1.1% (6)	
Unknown	3.5% (32)	5.2% (20)	2.2% (12)	
Relationship to child				0.019
Mother	81% (755)	76% (292)	85% (463)	
Father	14% (132)	18% (68)	12% (64)	
Other	2.4% (22)	2.6% (10)	2.2% (12)	
Unknown	1.9% (18)	3.1% (12)	1.1% (6)	

<sup>a</sup>% (n).

<sup>b</sup> Pearson's Chi-squared test comparing those providing a comment versus did not provide a comment. Due to low sample size, the unknown category was not included in the test as well as the other race category for test by race and ethnicity.

**Table 2**  
 Estimates and Variance Explained from Regression Models Predicting Overall Rating of Hospital and Willingness to Recommend Hospital, Among All Survey Respondents ( $N = 927$ ).

Model	Description of the Models and included Comment Indicator(s)	Overall Rating of Hospital			Willingness to Recommend		
		Estimate (SE)	Model R2	Difference in R2	Estimate (SE)	Model R2	Difference in R2
0	Base Model <sup>a</sup>	NA	0.41	NA	NA	0.34	NA
1	Base Model + Any Comment indicator Any Comment	<b>-3.49 (0.8)</b> ***	0.42	0.01	<b>-3.60(1.1)</b> **	0.35	0.01
2	Base Model + Valence indicators Any Positive Comment Any Negative Comment	<b>3.62 (0.8)</b> *** <b>-10.06 (0.9)</b> ***	0.49	0.08	<b>4.44 (1.1)</b> *** <b>-10.12(1.3)</b> ***	0.40	0.05
3	Base Model + Comment Content indicators Content related to non-HCAHPS rating Content related to specific non-HCAHPS content Content related to specific HCAHPS content	<b>1.90 (0.9)</b> * <b>-2.92 (0.9)</b> ** <b>-5.38(1.2)</b> ***	0.43	0.03	1.68 (1.2) -2.28 (1.2) <b>-6.08(1.6)</b> ***	0.36	0.02
4	Base Model + Actionability indicators Actionable at the provider level Actionable at the organization level	<b>-7.49(1.2)</b> *** <b>-9.29(1.0)</b> ***	0.49	0.08	<b>-8.29(1.7)</b> *** <b>-8.82(1.5)</b> ***	0.40	0.05
5	Base Model + Valence indicators + Actionability indicators Any Positive Comment Any Negative Comment Actionable at the provider level Actionable at the organization level	<b>3.76 (0.8)</b> *** -2.79 (1.6) <b>-6.86(1.4)</b> *** <b>-6.78 (1.6)</b> ***	0.51	0.10	<b>4.66(1.1)</b> *** -2.88 (2.3) <b>-7.77 (2.0)</b> *** <b>-6.12(2.2)</b> *	0.41	0.07

<sup>a</sup>Models are adjusted with case-mix variables (general health of the child, and respondent's age, education, and preferred language, respondent's relationship to the child, an indicator for the hospital where the child received care), overarching Child HCAHPS measure groupings, and indicators for screener questions related to child's age and abilities to talk. Stars represent Hochberg adjusted p-values from F-test:

\*  $p < 0.05$

\*\*  $p < 0.01$



SE indicates standard error.

<sup>\*\*\*</sup> $p < 0.0001$

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**Table 3**

Estimates and Variance Explained from Regression Models Predicting Overall Rating of Hospital and Willingness to Recommend Hospital, Among Respondents with a Comment (N= 545).

Comment Indicator added to Base Model <sup>a</sup>	Overall Rating of Hospital			Willingness to Recommend Hospital		
	Beta (SE)	R <sup>2</sup>	Difference in R <sup>2</sup>	Beta (SE)	R <sup>2</sup>	Difference in R <sup>2</sup>
Any Positive Comment	<b>12.63 (1.4)</b> ***	0.558	0.07	<b>15.29(1.8)</b> ***	0.502	0.07
Any Negative Comment	<b>-8.33 (1.3)</b> ***	0.521	0.04	<b>-8.82 (1.7)</b> ***	0.456	0.03
Content related to non-HCAHPS rating	<b>3.35 (1.1)</b> *	0.493	0.01	3.51 (1.5)	0.435	0.01
Content related to specific non-HCAHPS content	-0.92 (1.2)	0.485	0.00	-0.44 (1.6)	0.429	0.00
Content related to specific HCAHPS content	-3.55 (1.4)	0.491	0.01	-4.31 (1.8)	0.435	0.01
Actionable at the provider level	<b>-6.64(1.5)</b> ***	0.502	0.02	<b>-7.74 (2.0)</b> **	0.445	0.02
Actionable at the organization level	<b>-8.75(1.3)</b> ***	0.525	0.04	<b>-8.83 (1.7)</b> ***	0.456	0.03

Stars represent Hochberg adjusted p-values from F-test:

\* p < 0.05

\*\* p < 0.01

\*\*\* p < 0.001.

CI indicates confidence intervals.

<sup>a</sup>The base model is adjusted with case-mix variables (general health of the child, and respondent's age, education, and preferred language, respondent's relationship to the child, an indicator for the hospital where the child received care), overarching Child HCAHPS measure groupings, and indicators for screener questions related to child's age and abilities to talk. The base model R<sup>2</sup> value was 0.484 and 0.429 for outcomes *Overall Rating of Hospital* and *Willingness to Recommend Hospital*, respectively. Each row represents a separate model fit with adding the specified comment indicator to the base model.