Concern Explaining Nonresponsive Feeding: A Study of Mothers' and Fathers' Response to Their Child's Fussy Eating

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ABSTRACT

Objective: To examine the role of parent concern in explaining nonresponsive feeding practices in response to child fussy eating in socioeconomically disadvantaged families.

Design: Mediation analysis of cross-sectional survey data.

Setting: Socioeconomically disadvantaged urban community in Queensland, Australia.

Participants: Cohabiting mother–father pairs ($n = 208$) with children aged 2–5 years.

Main Outcome Measure(s): Two validated measures of nonresponsive feeding: persuasive feeding and reward for eating.

Analysis: Mediation analysis tested concern as a mediator of the relationship between child food fussiness (independent variable) and parent nonresponsive feeding practices (dependent variables), adjusted for significant covariates and modeled separately for mothers and fathers.

Results: Maternal concern fully mediated the relationship between child food fussiness and persuasive feeding (indirect effect: $B [SE] = 0.10 [0.05]$; 95% confidence interval [CI], 0.01–0.20). Concern also fully mediated the relationship between child food fussiness and reward for eating for mothers (indirect effect: $B [SE] = 0.17 [0.07]$; CI, 0.04–0.31) and fathers (indirect effect: $B [SE] = 0.14 [0.05]$; CI, 0.04–0.24).

Conclusions and Implications: Concern for fussy eating behaviors may explain mothers' and fathers' nonresponsive feeding practices. In addition to providing education and behavioral support, health professionals working with socioeconomically disadvantaged families can incorporate strategies that aim to alleviate parents' concerns about fussy eating.

Key Words: concern, fathers, feeding practices, fussy eating, mothers (*J Nutr Educ Behav.* 2018; 50:757–764.)

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INTRODUCTION

Almost half of all parents perceive their child to be a fussy eater at some point in the first 6 years of life.¹ Although this is a developmentally

normal and transient phase for most children,¹ the stress associated with fussy eating can negatively affect the child, parent, or child–parent relationship² regardless of duration. Fussy eating is an umbrella term describing

the chronic rejection of novel and/or familiar foods³ and is associated with poor variety⁴ and quantity of food intake.⁵ The rejection of novel foods may reflect a fear of trying new foods (food neophobia) but refusal of familiar foods (ie, foods already accepted in the child's diet) may reflect a child's satiety.⁶ Parents may interpret refusal of familiar food to be fussiness or perceive the behavior as problematic and (with good intention) use feeding practices that may not appropriately respond to the child's appetite. These nonresponsive feeding practices can perpetuate fussy eating,⁷ increase poor food preferences,⁸ and lead to unhealthy weight gain.⁹

Parents may attempt to manage their child's fussy eating by using nonresponsive feeding practices such

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as pressuring or offering food rewards to incentivize food intake.^{10,11} However, these practices are likely to be counterproductive. Pressuring a child to eat has been associated with increased food rejection¹² and exacerbation of fussy eating.⁷ Offering foods the child prefers (often energy dense and nutrient poor) as a reward for eating disliked foods is thought to reinforce preference for the rewarded food and reduce preference for the disliked (typically nutrient-dense) food.¹³ Although the feeding relationship is likely to be bidirectional,¹⁴ recent evidence suggested that parents respond to fussy eating by pressuring⁷ and using food as a reward for eating.¹⁰ Because nonresponsive feeding practices are modifiable,⁶ they are an appropriate target for early feeding interventions. However, it is important first to understand why parents respond to fussy eating by pressuring a child to eat and using food as a reward.

Contanzo and Woody's¹⁵ domain-specific model of parenting guided much of the child feeding literature to date, suggesting that parents' feeding practices are based on their perceptions, beliefs, goals, and concerns. Within this model, regardless of the presence of a problem, heightened concern or sensitivity¹⁶ is hypothesized to motivate parents' nonresponsive feeding practices.¹⁵ Parents' concern for child weight has mainly been investigated in the fussy eating space. For example, maternal concern about her child being underweight partially explains the relationship between perception of fussy eating and pressuring a child to eat.¹⁷ However, a recent study of phone calls made to a parenting help line showed that parents' concern for fussy eating encompassed broader elements of the child's diet, such as variety and quantity of food intake, as opposed to concern for the child's weight.¹⁸ The authors further described that parents' heightened concern motivated feeding strategies of forced feeding and rewarding.¹⁸ Owing to the qualitative nature of the study,¹⁸ it was unclear whether additional parent and child factors may have confounded parents' perceptions, concerns, and responses to fussy eating, such as child temperament^{19,20} and parent psychological

distress.²¹ Research methods that control for these potential confounders would further support the domain-specific model of parenting¹⁵ in the fussy eating context.

The role of parent concern has been derived from studies with samples of highly educated mothers and has rarely been considered in fathers or in the context of socioeconomic disadvantage. Socioeconomic disadvantage is correlated with higher levels of fussy eating¹ and greater use of nonresponsive feeding practices in mothers²² and fathers.²³ Therefore, understanding mechanisms driving fathers' and mothers' nonresponsive feeding practices may be particularly pertinent in the context of economic constraint to intervene in the cycle of fussy eating.⁷ This was the aim of the current study, which examined mothers' and fathers' concern for their child's fussy eating as a potential mechanism driving pressure and using food as a reward in a sample of 2-parent families from a socioeconomically disadvantaged community.

METHODS

Participants and Recruitment

Setting. Participants were from *Mums and Dads for Mealtimes*, a study of 2-parent families from a socioeconomically disadvantaged community in Queensland, Australia.²⁴ This community was identified as having a high proportion of children with developmental vulnerability by the Australian Early Development Census.²⁵ Developmental vulnerability is a population-based measure of children's development, health, well-being, and skills at the time of commencing their first year of school (at age 5 years). Children's development is assessed in 5 domains, including physical health, social competence, emotional maturity, language and cognition, and communication and general knowledge. In the selected community, 1 in 3 children (33%) were identified as developmentally vulnerable compared with the national average (22%).²⁵ Queensland-based data showed a strong inverse correlation between a child's likelihood of being developmentally vulnerable and the socioeconomic status of the area in which the child

resides.²⁶ Ethical approval was obtained from the Queensland University of Technology Human Research Ethics Committee (1600000045).

Recruitment. Recruitment was through face-to-face approaches to child care centers, playgroups, a local family fun day, and an immunization clinic, from February to September, 2016. Cohabiting mother–father pairs of children aged 2–5 years were invited to participate. Participants completed a hard-copy or online “Mother” or “Father” survey and were offered a gift voucher (valued at \$15 AU) for participation. Mothers and fathers were defined as biological/adoptive/step-parents, partner of child's father/mother, or grandparent. Participants were included in the study if they were parents aged ≥ 18 years; 2 parents of the same child returned surveys; the child's gestational age was >32 weeks and the birth weight was $>2,500$ g; the birth was singleton; and the child had no serious medical diagnoses including food-related allergy or sensitivity. A small number of children ($n=8$) were aged <2 years at the time of returning the survey (minimum age 1 year 8 months). These children remained in the analyses to maximize the sample size. A total of 208 mother–father pairs were included in the analysis.

Measures

Sociodemographic characteristics. Mothers and fathers reported their own sociodemographic data, height, weight, and number of meals (ie, breakfast, lunch, and dinner) eaten per week with the child (out of 21). Parents scored their perceived responsibility in feeding (3 items) using the Child Feeding Questionnaire²⁷ on a 5-point Likert scale from never (1) to always (5), with higher mean scores indicating greater responsibility ($\alpha=.86$ for mothers, $\alpha=.92$ for fathers).²⁷ Parental distress was assessed using the Kessler-10,²⁸ a 10-item scale that screens for symptoms of depression, anxiety, and stress on a 5-point Likert scale from never (1) to always (5). Scores were summed to give an individual distress score for each parent ($\alpha=.92$ for both mothers and fathers). Both parents also reported on child height, weight,

and temperament.²⁹ Child body mass index (BMI) z score was calculated according to World Health Organization standards;³⁰ however, 32% of children had missing data and a further 3 were excluded owing to biologically implausible values. Child temperament was assessed using the 12-item version of the Short Temperament Scale for Children (STSC).²⁹ The STSC has been validated in children aged 3–7 years and has been used extensively in the Australian population.^{29,31} Parents scored items of the STSC²⁹ on a 6-point Likert scale from almost never (1) to almost always (6). Scores were summed for mothers and fathers individually to produce an overall easy to difficult temperament score, with higher scores indicating easier temperament ($\alpha = .76$ for mothers; $\alpha = .72$ for fathers).

Fussy eating. Both mothers and fathers reported the frequency of their child's fussy eating behaviors using the food fussiness subscale (6 items) of the Children's Eating Behavior Questionnaire.³ Item response options ranged from never (1) to always (5). Item scores were averaged to calculate mean food fussiness, with higher scores indicating greater fussy eating. Scores for both mothers and fathers showed good internal reliability ($\alpha = .91$ and $.90$, respectively).

Parental feeding practices. Mothers and fathers reported their feeding practices using the Feeding Practices and Structure Questionnaire-28.³² This questionnaire is designed to capture nonresponsive and mealtime structure-related feeding constructs and showed measurement invariance across mothers and fathers in the current sample.²⁴ Two nonresponsive feeding practice subscales were used in the current analyses: persuasive feeding (6 items) (eg, *When your child refuses food they usually eat, do you insist your child eats it?*) and reward for eating (4 items) (eg, *When your child refuses food they usually eat, do you encourage to eat by offering a reward other than food?*). Mothers and fathers scored items on a 5-point Likert scale, from never/disagree (1) to always/agree (5). Mean scores were calculated for mothers and fathers, with higher scores indicating greater use of the feeding practice. The

subscales showed acceptable to good internal reliability for mothers and fathers ($\alpha > .72$).

Concern for child's fussy eating. A literature search identified no validated scale measuring overall parental concern for child fussy eating behavior. Therefore, 4 items were adapted from the study by Chan et al³³ measuring maternal concern for their child's variety of food intake ($n = 374$; children aged 12–36 months). The items in the current study asked parents to report how frequently, on a 5-point Likert scale from never (1) to always (5), they worried about (1) their child's fussy eating, (2) their child not eating a varied diet, (3) their child not eating a balanced diet (eg, avoiding certain food group[s] such as vegetables, meats, or dairy), and (4) how much their child ate. The mean score of the 4 items was calculated for mothers and fathers, with a higher mean score indicating greater concern for the child's fussy eating behavior. The scale showed good internal reliability for mothers ($\alpha = .90$) and fathers ($\alpha = .92$).

Data Analysis

Preliminary analyses. All analyses were completed with SPSS Statistics (version 23.0, IBM Corp, Armonk, NY, 2015). Missing items on the food fussiness, concern for the child's fussy eating, persuasive feeding, and reward for eating subscales were imputed using expectation maximization (missing data ranging from 0% to 3.6% for each item). Differences between mothers' and fathers' sociodemographic characteristics were examined using independent-sample *t* tests (for continuous variables) and chi-square tests (for categorical variables). Data on the parent-reported child variables (age, sex, temperament, and BMI z score) were compared using paired-samples *t* tests. Differences between maternal and paternal perceptions of child food fussiness, concern, and nonresponsive feeding practices were examined using linear mixed models to control for family membership and covariates (parent age, university education, place of birth, and distress; and child age, gender, and

temperament) which were chosen *a priori* based on previous reports identifying these factors as potential confounders.^{19,34,35} Parent BMI and child BMI z score were not entered as covariates into the analysis owing to a high number of missing variables (11% and 33% missing for parent BMI and child BMI z score, respectively). Nevertheless, parent BMI and child BMI z score in the available data were not significantly correlated to child food fussiness, concern, or feeding practices ([Supplementary Data](#)).

Mediation analyses. Data for mothers and fathers were analyzed separately for the remaining analyses. Bivariate Pearson correlations between the main variables of interest were examined. All correlations were significant and were therefore followed up with multivariable linear regression models, controlling for covariates that were both significantly associated ($P < .05$) with the mediator (concern) and dependent variable (persuasive feeding or reward for eating) ([Supplementary Data](#)). Mediation analysis was performed if the mediator (concern) was significantly associated with the independent variable (food fussiness) and the dependent variable (persuasive feeding or reward for eating), controlling for the independent variable (food fussiness) and covariates. The SPSS PROCESS macro³⁶ was used to analyze whether concern mediated the relationship between food fussiness and parental feeding practices, adjusting for covariates. Bias-corrected bootstrapping confidence intervals (CIs) at the 95% level were used for 5,000 resamples to establish total, direct, and indirect effects.³⁶ Mediation was established if the CI did not cross 0.³⁶

RESULTS

Preliminary Results

[Table 1](#) lists parent sociodemographic characteristics. Children (49% girls), had a mean age of 3.6 ± 1.0 years and a BMI z score of 0.67 ± 1.33 . Parent-reported child characteristics did not differ between mother–father pairs (all $P > .05$); therefore,

Table 1. Characteristics of Mothers and Fathers in the *Mums and Dads for Mealtimes* Study

Characteristics	Mean $\pm$ SD or n (%)	
	Mothers (n = 208)	Fathers (n = 208)
Age, y	33 $\pm$ 5	36 $\pm$ 7*
Weight status prevalence (self-reported)		
Healthy weight (body mass index < 25)	98 (47)	54 (26)
Overweight/obese (body mass index $\geq$ 25)	110 (53)	154 (74)***
University educated	67 (33)	48 (23)*
Biological parent	202 (97)	196 (94)
Born in Australia/New Zealand	164 (79)	171 (82)
English language spoken at home	183 (88)	187 (90)
Identify as Aboriginal or Torres Strait Islander	10 (5)	8 (4)
Paid work/wk, h	18 $\pm$ 17	39 $\pm$ 16***
Meals eaten/wk with child, n ^a	16 $\pm$ 5	13 $\pm$ 5***
Perceived responsibility in feeding ^b	4.3 $\pm$.7	2.6 $\pm$.9***
Distress ^c	20 $\pm$ 8	17 $\pm$ 7***
High or very high distress (score ^c > 22)	75 (37)	46 (23)**

^aOut of a possible score of 21; ^bChild Feeding Questionnaire (range, 1–5)²⁷; ^cKessler-10²⁸ (range, 10–50); * $P < .05$; ** $P < .01$; *** $P < .001$.

Notes: Body mass index is measures as kg/m². Maternal and paternal characteristics were compared using independent-samples *t* tests and chi-square tests for continuous and categorical variables, respectively.

maternal-reported data were used in further analyses as a default for consistency. However, mothers scored their child's temperament as more difficult than did fathers (42.2 $\pm$

9.0 vs 44.2 $\pm$ 8.4; $P = .02$); therefore, mothers' and fathers' individual scores of the child's temperament were used in further analyses.²⁹ Mean scores for mothers' and fathers'

perception of child's food fussiness, concern, and feeding practices, and correlations between these variables, are reported in Table 2. Linear mixed models showed that mothers

Table 2. Descriptives and Correlations Between Mother's and Father's Mean Subscale Scores for the *Mums and Dads for Mealtimes* Study

Subscales	Mothers (n = 208) (mean $\pm$ SD)		Fathers (n = 208) (mean $\pm$ SD)
Food fussiness ^a	2.98 (0.92)		2.99 (0.97)
Concern ^b	2.45 (1.11)		2.23 (1.06)*
Persuasive feeding ^c	3.36 (0.73)		3.41 (0.77)*
Reward for eating ^c	2.66 (0.98)		2.76 (0.99)
Correlations	Concern ^b	Persuasive Feeding ^c	Reward for Eating ^c
Mothers			
Food fussiness ^a	0.71***	0.32***	0.30***
Concern ^b	-	0.33***	0.26***
Fathers			
Food fussiness ^a	0.64***	0.37***	0.31***
Concern ^b	-	0.33**	0.35**

^aChildren's Eating Behavior Questionnaire;³ ^bConcern for child's fussy eating (study-specific scale); ^cFeeding Practices and Structure Questionnaire-28;³² All subscale scores ranged from 1 to 5; * $P < .05$, ** $P < .01$, *** $P < .001$.

Notes: Scales compared mothers and fathers using linear mixed models, controlling for parent age, university education, place of birth, and distress;²⁸ and child age, gender, and temperament.²⁹ Bivariate Pearson correlations were used to examine correlations.

Figure. Mediation models for mothers' ($n = 208$) and fathers' ($n = 208$) perceptions of child food fussiness (aged 3.6 years) on parent nonresponsive feeding practices through concern. ^aFood fussiness was measured via the Children's Eating Behavior Questionnaire;³ ^bConcern for child's fussy eating (study-specific scale); ^cFeeding Practices and Structure Questionnaire-28;³² * $P < .05$, ** $P < .01$, *** $P < .001$. Mediation models show the unstandardized coefficient followed by SE estimates in parentheses. Covariates were controlled for in model A: distress;²⁸ B: child age; C: distress;²⁸ and child temperament.²⁹

were more concerned about their child's fussy eating ($F_{1,205.1} = 5.50$; $P = .02$) and reported less persuasive feeding ($F_{1,204.4} = 4.43$; $P = .04$) than fathers when controlling for covariates (parent age, university education, place of birth, and distress; and child age, gender, and temperament).

Mediation Results

All of the regression models tested met the conditions for mediation except for fathers' persuasive feeding, which was not significantly associated with concern when controlling for food fussiness ($P = .08$). Thus, mediation analysis was not performed for fathers' persuasive feeding. The bias-corrected bootstrap 95% CI indicated that mothers' concern fully mediated the relationship between child food fussiness and persuasive feeding, controlling for distress (indirect effect: $B [SE] = 0.10 [0.05]$; 95% CI, 0.01–0.20) (Figure A). The model accounted for 13.8% of variance in maternal persuasive feeding ($F_{3,200} = 10.7$; $P < .001$). Maternal concern also fully mediated the relationship between perception

of child food fussiness and reward for eating, controlling for child age (indirect effect: $B [SE] = 0.17 [0.07]$; CI, 0.04–0.31 (Figure B). The model explained 17.2% of variance in mothers' reward for eating ($F_{3,204} = 14.1$; $P < .001$). Paternal concern fully mediated the relationship between fathers' perception of child food fussiness and reward for eating, controlling for fathers' distress and perception of child temperament (indirect effect: $B [SE] = 0.14 [0.05]$; CI, 0.04–0.24) (Figure C). The model explained 16.4% of variance in reward for eating ($F_{4,193} = 9.4$; $P < .001$). A sensitivity analysis was performed by running the mediation models again using the other parent's report of child food fussiness as the independent variable. The results remained similar (data not shown).

DISCUSSION

This study aimed to advance current knowledge about the relationship between fussy eating and parental nonresponsive feeding practices by examining concern as a potential underlying mechanism.

Dynamics driving mothers' and fathers' feeding practices were examined in a population at risk for using more nonresponsive feeding practices^{22,23} and a higher prevalence of fussy eating¹ as well as poor nutrition and unhealthy weight gain in the long term.³⁷ This study expanded on previous concepts of concern (ie, concern regarding the child's weight)¹⁷ related to fussy eating by assessing parental concern of their child's dietary quality and quantity of food intake.

The study's findings indicated that while both mothers' and fathers' reports of their child's fussy eating were consistent, mothers reported higher levels of concern. Although to the best of the authors' knowledge, there were no prior such comparisons in the published literature, these differences are likely to relate to the differential inputs and responsibility for family feeding assumed by mothers and fathers. Previous literature suggested that implicit gender assumptions assign greater responsibility to mothers than fathers for feeding and child nutrition.³⁸ Concern for fussy

eating may also more broadly capture an aspect of parenting sensitivity, a characteristic ubiquitous in mothers.³⁹ Parenting sensitivity describes a parent's awareness and appropriate responsiveness to a child's verbal and nonverbal cues.⁴⁰ Although thought to be a beneficial parenting characteristic, sensitivity may be dysfunctional at a high level.¹⁶ Negative responses from a child's food refusal (ie, crying, tantrums, gagging) may elicit distress from the overly sensitive parent, thus emphasizing anxiety for both parent and child at mealtimes. In a sample of 4-year-old Norwegian children (n = 795, mostly maternal informants), parenting sensitivity was found to reinforce fussy eating over 2 years.¹⁶ Heightened emotional responses to children's fussy eating may emphasize affective feeding interactions and mealtime conflict.

The current findings indicate that maternal concern fully explained the relationship between perception of fussy eating and nonresponsive feeding practices, supporting the domain-specific model of parenting.¹⁵ Furthermore, pressuring and rewarding for eating in response to fussy eating concerns align with qualitative accounts in a sample of 12 parents, 11 of whom were mothers.¹⁸ Feeding has a significant emotional component that may drive mothers to use nonresponsive feeding in circumstances in which there is concern for the child's insufficient quantity of food or poor dietary quality intake.¹⁸ This suggests that acknowledging mothers' concerns about the child's fussy eating may be an important target for future feeding interventions.

Although fathers used more persuasive feeding than did mothers in the current sample, this behavior was not driven by paternal concern. A possible explanation may be that fathers were responding pragmatically rather than out of concern. A qualitative study of mothers (n = 55) and fathers (n = 29) found that after a full day's work, parents lacked patience and motivation at mealtimes.⁴¹ In the current sample, fathers worked longer hours than did mothers. Therefore, fathers' persuasive feeding may have been driven by time pressures and pragmatism to

complete the mealtime, as opposed to concern for the child's fussy eating. Similar to mothers, fathers' concern fully mediated the relationship between perception of the child's fussy eating and reward for eating. Acknowledging and addressing fathers' and mothers' concern as a potential driver for using food as a reward may improve parental responses to fussy eating. However, further research is required to clarify this hypothesis.

Findings from the current study must be considered with respect to the strengths and limitations of the study design. The analyses were based on cross-sectional data, which limits claims on the direction of findings. Although evidence suggests that parents responded to fussy eating behaviors using pressure and reward^{7,10} and directed the temporal ordering of variables within the mediation models, to establish directionality conclusively would require longitudinal data and cross-lagged analyses. Child feeding occurs in an economic, social, and emotional context. The strength of the current findings was in directing attention to the latter. The researchers were also able to capture a sample of socioeconomically disadvantaged families, as indicated by the level of education. The current sample had a lower proportion of university-educated parents (mothers: 33%; fathers: 23%) compared with Australian Bureau of Statistics data,⁴² indicating that 42% of women (aged 25–35 years) and 33% of men (aged 35–44 years) had completed a university degree. However, the sample had similar levels of university education compared with the general US population (33% of adults aged >25 years).⁴³ Therefore, these results cannot be generalized beyond socioeconomically disadvantaged Australian families. Furthermore, this sample of mothers and fathers reported a greater proportion of high or very high psychological distress (37% and 23%, respectively) compared with national data (12%).⁴⁴ Because distress was positively associated with concern for fussy eating in this socioeconomically disadvantaged sample ([Supplementary Data](#)), qualitative studies could further elucidate relationships

among poverty, distress and concern regarding feeding to better support parents experiencing hardship in the future.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Future research could further examine the mechanisms underlying parent nonresponsive feeding practices to guide directions for intervention. For example, exploring fathers' concern and different motivations for using persuasive feeding and reward for eating could be considered in future research. One hypothesis for finding fathers' concern as a mediator for reward for eating but not persuasive feeding is that concerned fathers may make efforts beyond subtle pressuring to promising food rewards to encourage food intake. A father wishing to encourage his child's food intake may persuade his child to eat as a subtle, 1-step strategy. However, concerned fathers may use a 2-step negotiation strategy to reward a fussier child for eating (eg, *I will give you a dessert if you eat your broccoli*). In addition, providing food as a reward requires the use of greater resources, which are likely to be limited in socioeconomically disadvantaged households. Fathers who are concerned about their child's fussy eating may feel that using these resources is warranted and effective in getting a child to eat. Whether other potential motivators differ between mothers and fathers would also be an interesting avenue for further research.

The current study provided some data to inform practice that is particularly pertinent, because the findings relate to socioeconomically disadvantaged families that may be at risk for nonresponsive feeding.^{22,23} Researchers might consider validating the self-reported measures used in the current study by objectively measuring child BMI z score, dietary intake (including both quantity and quality), or observed fussy eating or feeding practices to understand whether there are grounds for concern. Although fussy eating is transient for most children, the current results suggest that parents' concern

may drive persuasive and rewarding feeding practices. How these feeding practices influence long-term outcomes warrants further exploration. Findings from this study suggest that health professionals tasked with advising parents of fussy eaters might be alert to the mediating role of concern and include reassurance strategies as well as education and positive behavioral strategies to support parents.

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SUPPLEMENTARY DATA

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