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Message Framing and Perinatal Decisions

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What's Known on This Subject

No studies to date have investigated effects of message framing on parental decisions regarding delivery room management of extremely premature infants. Prenatal consultation investigations have focused on recall or satisfaction, rather than issues pertaining to informed consent and nondirective counseling.

What This Study Adds

This study investigates the impact of message framing on perinatal decisions and brings attention to subtle aspects of communication that can affect nondirective counseling. Practicing neonatologists should be cognizant of these potential biases when counseling patients regarding extremes of prematurity.

ABSTRACT

OBJECTIVES. The purpose of this study was to explore the effect of information framing on parental decisions about resuscitation of extremely premature infants. Secondary outcomes focused on elucidating the impact of other variables on treatment choices and determining whether those effects would take precedence over any framing effects.

METHODS. This confidential survey study was administered to adult volunteers via the Internet. The surveys depicted a hypothetical vignette of a threatened delivery at gestational age of 23 weeks, with prognostic outcome information framed as either survival with lack of disability (positive frame) or chance of dying and likelihood of disability among survivors (negative frame). Participants were randomly assigned to receive either the positively or negatively framed vignette. They were then asked to choose whether they would prefer resuscitation or comfort care. After completing the survey vignette, participants were directed to a questionnaire designed to test the secondary hypothesis and to explore possible factors associated with treatment decisions.

RESULTS. A total of 146 subjects received prognostic information framed as survival data and 146 subjects received prognostic information framed as mortality data. Overall, 24% of the sample population chose comfort care and 76% chose resuscitation. A strong trend was detected toward a framing effect on treatment preference; respondents for whom prognosis was framed as survival data were more likely to elect resuscitation. This framing effect was significant in a multivariate analysis controlling for religiousness, parental status, and beliefs regarding the sanctity of life. Of these covariates, only religiousness modified susceptibility to framing; participants who were not highly religious were significantly more likely to be influenced to opt for resuscitation by the positive frame than were participants who were highly religious.

CONCLUSIONS. Framing bias may compromise efforts to approach prenatal counseling in a nondirective manner. This is especially true for subsets of participants who are not highly religious. *Pediatrics* 2008;122:109–118

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Key Words

premature infants, resuscitation, decision-making, counseling, informed consent, parental autonomy

Abbreviations

OR—odds ratio
CI—confidence interval

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IN NEONATOLOGY, PHYSICIANS and parents often are faced with morally controversial decisions regarding resuscitation and intensive care of extremely premature infants for whom outcomes are uncertain and guarded. Under these circumstances, the Committee on Bioethics of the American Academy of Pediatrics has advocated for a negotiation model of shared decision-making, whereby the physician has an ethical duty to seek actively and to respect information regarding parental preferences and values, in exchange for medical information.¹ The statement of the American Academy of Pediatrics regarding perinatal care at the threshold of viability also indicates that a nondirective approach to prenatal counseling is recommended whenever possible, to allow parents to choose a course of action consistent with their own personal values and goals, and the information transferred by the physician to the parents should be without bias.²

The process of decision-making for parents is highly dependent on the information transferred to the parents from the physician.^{3–14} It is well documented from adult medical literature and genetic counseling literature that subtle aspects of communication (eg, message framing) can inadvertently affect patient preferences and decisions.^{15–28} Therefore, message framing may represent 1 aspect of communication that affects parental choice, but no studies have yet investigated whether such effects are operative in prenatal counseling in cases of extreme prematurity, nor

have studies been performed to investigate whether message framing is applicable to decisions dependent on fundamental moral values under circumstances in which consequences of life and death are so proximate to the decision.

This study was designed to explore the effect of information framing on parental decisions to initiate resuscitation for extremely premature newborns. The premise was that decisions would be influenced by the way in which the outcomes for an infant at 23 weeks of gestation were presented (as gains and losses, positively and negatively). The null hypothesis was that the way in which the information was framed would not affect parental decisions regarding initiation of resuscitation. The secondary null hypothesis was that strong religious faith would not modify susceptibility to framing. Secondary outcomes focused on elucidating the relationships that other variables might have to treatment choice.

METHODS

This institutional review board-approved study was conducted by using a confidential survey administered to adult volunteers via the Internet and was recruited and sponsored by the Center for Decision Sciences at Columbia University. The study was originally designed to be completed by pregnant women after 26 weeks of gestation, to minimize the potential to cause anxiety. However, the institutional review board required that data first be obtained from nonpregnant participants. The surveys depicted a hypothetical vignette of a threatened delivery at gestational age of 23 weeks, with prognosis framed either as survival with lack of disability (positive frame) or as death and likelihood of disability among survivors (negative frame), followed by a questionnaire. Participants were randomly assigned to receive either the positively or negatively framed vignette.

Existing participants from the Center for Decision Sciences database (a sample that is consistent with the US population demographic characteristics, within 5%) were invited to participate in the study. Participants had to be >18 years of age, according to Center for Decision Sciences requirements; otherwise, there were no exclusion criteria. Existing participants were sent invitations through e-mail, and new participants were recruited through advertisements on Web sites. Invitations were sent out in 2 waves of recruitment, in which 120 to 300 people were invited at a time. This study was included with other unrelated studies in these waves and was presented first. Participation was voluntary. Existing participants had already completed intake questionnaires for previous studies. New participants filled out an intake questionnaire when registering with the Center for Decision Sciences. Identifying information was kept in a separate database and was never linked to the survey responses.

On average, the time required to complete our study was <15 minutes; no participant required >1 hour. After completion of the survey, the participants were paid \$4 by the Center for Decision Sciences. Participants were able to contact the investigators with any com-

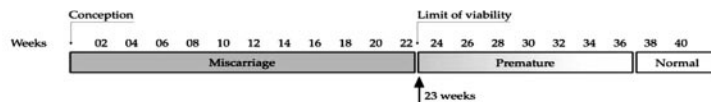
ments or concerns (eg, increased anxiety or discomfort with the survey).

The vignettes were constructed to be identical regarding general information about prematurity and descriptions of severe disability, resuscitation, and comfort care in lay terms (Fig 1). Great care was taken to ensure that no framing bias was inadvertently incorporated into the general content. After reading the general information, the participant was given a hypothetical vignette with prognostic information framed either with survival and nondisability statistics (positive frame) or with mortality and disability statistics (negative frame). The positive frame read as follows: "25 out of 100 infants will survive if provided intensive care. Of those who survive, 15 out of the 25 infants will not have severe developmental disabilities." The negative frame read as follows: "75 out of 100 infants will die even if provided intensive care. Of those who don't die, 10 out of the 25 infants will have severe developmental disabilities."²⁹ Participants were then asked to select a course of action, either resuscitation or comfort care.

After completing the survey vignette, participants were directed to a questionnaire designed to test the secondary hypothesis and to identify possible predictors (Fig 2). Questions used a 6-point Likert scale and explored relationship status, values related to preservation of life and quality of life, and role preference for paternalism versus autonomy in decision-making, with 2 questions regarding religiousness. The religion questions were selected from the Duke Religion Index scale,³⁰ a scale demonstrated previously to measure intrinsic religiousness with both high construct validity ($r = 0.85$ with other scales) and reliability of 0.75. There were yes/no questions about marital status, whether participants had children, experiences with prematurity, and pregnancy status.

Variables to be investigated for their relationship to the treatment decision were chosen on the basis of the premise that individuals' preexisting perceptions and context cannot be ignored in investigations of framing effects.^{10,13,14,31-38} Because there were only 2 studies^{32,35} alluding to factors important in parental decisions regarding resuscitation of premature infants at the time this research was undertaken, we selected effect modifiers a priori that we thought would have the greatest impact on parental decisions.^{5,20,31,32,35} Religious concerns, in particular, are frequently cited as important determinants of parental decisions to withdraw care.^{31,32,35} These variables were also tested to determine whether they modified susceptibility to framing.

A sample size of 192 subjects was calculated to be necessary to detect a difference between the 2 proportions as small as 30%, estimating that 60% of participants in 1 of the groups would choose resuscitation, with a P value of .05 and a power of 80%. We used 30% as the minimal detectable difference between proportions on the basis of the seminal experiments performed by Tversky and Kahneman and others.³⁶⁻⁴⁰ We estimated that ~60% of the participants would choose resuscitation at baseline, regardless of birth weight and gestational age, on the basis of the study by Streiner et al.³⁵



A baby born before 37 weeks of gestation is premature. Premature babies that are born later (after 28 weeks) have a higher probability of survival and normal development. However babies born before 25 weeks are at substantial risk for severe developmental disabilities like mental retardation, cerebral palsy, physical handicaps, blindness and deafness. Babies born very prematurely (e.g. 23 weeks) have a high probability of these severe developmental disorders as well as death.

Hospitals offer two types of care for babies born very prematurely (e.g. 23 weeks). When this happens, parents have to choose which type of medical care they want for their child.

One option is called intensive care. This means that the baby will go to an intensive care unit where an artificial breathing machine will help them breath. Other machines will help keep their heart beating and assist them in trying to stay alive.

Another option is called comfort care. This means that the baby is kept warm, comfortable and out of pain until the baby dies on their own. Doctors and nurses take care of the baby during this time and usually parents can hold the baby.

Imagine now that you (or someone close to you) are pregnant. You have just come back from a trip and notice that you are having cramps. You are worried because you are at only 23 weeks which is very premature. Up until now your pregnancy has been normal. You visit your doctor who tells you that you are going into premature labor and that you may deliver in the next 36 hours. Your doctor admits you to the hospital and tries to help stop your labor. You ask your doctor what usually happens when babies are born this early. Your doctor tells you:

At 23 weeks, which is how far along you are in your pregnancy, 25 out of 100 babies will survive if provided intensive care. Of those who survive, 15 out of the 25 babies will not have severe developmental disabilities. With comfort care, all babies born this early would die. However, the baby's suffering would be minimized.

Your doctor asks you what option you want to choose.

- I would want the doctors to provide the baby intensive care.
- I would want the doctors to provide the baby comfort care.

There is no right or wrong answer. Both options are respected and legal.

FIGURE 1
Web page presenting positively framed vignette.

The independent variable in this study was the message framing, and the dependent variable was whether to initiate resuscitation. Analysis was performed with χ^2 tests and multivariate logistic regression analysis, by using SPSS 14 (SPSS, Chicago, IL).

For descriptive purposes, responses to the questionnaire are reported for the 6 Likert response categories. For univariate analyses, the Likert scale was transformed to binary variables by combining groups 1 to 3 as one group and groups 4 to 6 as another group. Religiousness was transformed into a single binary variable in the following manner: to be considered to have strong faith, individuals needed to answer in categories 1 or 2 for the religious approach to life and in categories 1 or 2 for the religious activities question. Multivariate logistic regression analysis was performed by incorporating framing and all variables associated with treatment decisions at a *P* value of $<.10$ in univariate analyses.

RESULTS

A total of 365 subjects were recruited for the study, of whom 20% failed to complete the study. A total of 292 subjects completed the survey; 146 subjects were randomly assigned to receive prognostic information framed positively (as survival and nondisability rates) and 146 subjects to receive prognostic information framed negatively (as mortality and disability rates). This number exceeded our expected sample size of 192 because 2 waves of invitations were sent out for reasons not pertaining to our particular study. No comments or concerns were communicated by the study participants.

Demographic data on age, education, and gender were available for 66% of the population and were similar for the 2 intervention groups, as well as with respect to the overall database (Table 1). These demographic data are incomplete because of a server failure during recruitment of new participants.

Survey post Neonatal question

Questions marked with a * are required.

- *1. No matter what the circumstances, one should never tell people what they have to do.
- Strongly agree
 - Agree
 - Slightly agree
 - Slightly disagree
 - Disagree
 - Strongly disagree
- *2. Future physical or mental disabilities should not be considered when deciding to place a premature baby in intensive care.
- Strongly agree
 - Agree
 - Slightly agree
 - Slightly disagree
 - Disagree
 - Strongly disagree
- *3. What someone's day to day life is like (Quality of Life) is more important than how long that person's life is.
- Strongly agree
 - Agree
 - Slightly agree
 - Slightly disagree
 - Disagree
 - Strongly disagree
- *4. My religious beliefs are what really lies behind my whole approach to life.
- Strongly agree
 - Agree
 - Slightly agree
 - Slightly disagree
 - Disagree
 - Strongly disagree

FIGURE 2
Postvignette questionnaire.

As can be seen in Table 2, most participants were parents, most had experience with prematurity (no information about the degree of prematurity was sought), and most were married or in a significant relationship. Only 6% of participants were pregnant at the time of the study.

As can be seen in Table 3, most participants preferred autonomy to paternalism and most believed that quality of life should be an important consideration in decisions about resuscitation; 64% strongly agreed or agreed that quality of life was important, whereas only 4% strongly disagreed or disagreed.

Forty percent of the participants reported that they spend time once a week or more in religious activities such as prayer meditation or religious readings. Fourteen percent reported engaging in these activities a few times a month, 16% a few times a year, 10% once a year or less, and 21% reported never engaging in religious activities.

Overall, 24% of the participants chose comfort care and 76% chose resuscitation. In univariate analyses, a strong trend toward a framing effect on treatment preference was seen. Respondents for whom prognosis was framed as survival and nondisability rates were more likely to elect resuscitation than were respondents for whom prognosis was framed as mortality and disability rates (odds ratio [OR]: 1.72; 95% confidence interval [CI]: 0.99–2.78; $P = .05$) (Table 4). Participants who highly regarded preservation of life were more likely to chose resuscitation (OR: 4.17; 95% CI: 2.27–7.8; $P = .00$), and those with strong religious faith were more likely to chose resuscitation (OR: 2.78; 95% CI: 1.56–5.0; $P = .04$). Sixty percent of participants who were highly religious indicated that they valued preservation of life ($P = .04$); 48% of participants who were not highly religious also valued preservation of life, although not significantly. There were no significant relationships

FIGURE 2
Continued.

- *5. How often do you spend time in private religious activities, such as prayer, meditation or religious readings?
- More than once a week
 - Once a week
 - A few times a month
 - A few times a year
 - Once a year or less
 - Never
6. What is your marital status?
- Single
 - Member of a committed unmarried couple
 - Married
 - Separated
 - Divorced
 - Widowed
- *7. How many children do you have?
-
8. If you are a woman, are you currently pregnant?
- Yes
 - No
- *9. Do you know anyone who has had a premature baby?
- Yes
 - No

between treatment decisions and the other possible predictors.

In a number of multivariate regression models that included a variety of possible predictor variables, the

effect of framing on decision-making was stable (OR: 1.7–1.8). In a model controlling for parental status, religiosity, and beliefs regarding preservation of life, framing significantly affected the decision to resuscitate or to offer comfort care (OR: 1.8; 95% CI: 1.02–3.24; $P = .04$) (Table 5). Participants who received the positive frame were significantly more likely to choose resuscitation, whereas participants who received the negative frame were significantly more likely to choose comfort care.

We tested our secondary hypothesis, that religious-

TABLE 1 Demographic Data for the Study Groups

Demographic Characteristic	Survival Frame	Mortality Frame
<i>N</i>	98	96
Gender, <i>n</i> (%)		
Female	67 (68)	71 (74)
Male	31 (32)	25 (26)
Education, <i>n</i> (%)		
Less than high school diploma	0 (0)	5 (5)
High school diploma or equivalent	51 (52)	42 (44)
Associate degree	6 (6)	7 (7)
Bachelor's, master's, or doctoral degree	41 (42)	42 (44)
Age, <i>n</i> (%)		
18–39 y	65 (66)	47 (49)
40–59 y	28 (29)	45 (47)
>60 y	4 (4)	4 (4)

Data were available for 194 of 292 participants.

TABLE 2 Distribution of Responses for Possible Predictor Questions With Yes/No Responses (*N* = 292)

Independent Variable	Proportion, %	
	Yes	No
Marital status	65	35
Parenthood	69	31
Pregnancy	6	94
Experience with prematurity	66	34

TABLE 3 Distribution of Responses for Possible Predictor Questions With 6-Point Likert Scale Responses (N = 292)

Independent Variable	Proportion, %					
	Strongly Agree	Agree	Slightly Agree	Slightly Disagree	Disagree	Strongly Disagree
Importance of autonomy	30	21	19	11	14	6
Importance of preservation of life	14	17	17	14	22	16
Importance of quality of life	29	36	23	6	2	3
Highly religious approach to life	19	17	16	12	17	21

ness would modify the effect of framing on resuscitation decisions, by including a term for interaction between framing and religiousness in the model. We found that religiousness modified the effect of framing on treatment decisions (OR: 1.39; 95% CI: 1.016–1.909; $P = .039$). This indicated that participants who were not highly religious were significantly more likely to be influenced to opt for resuscitation by a positive frame than were participants who were highly religious.

Overall, regardless of framing, 84% of participants who identified themselves as being highly religious ($n = 75$) chose resuscitation, compared with 75% percent of participants who did not identify themselves as being highly religious ($n = 217$). Participants who did not identify themselves as being highly religious were significantly more likely to chose resuscitation when receiving the positive message frame (OR: 2.27; 95% CI: 1.19–4.33; $P = .012$), compared with the negative frame (Fig 3). For participants who identified themselves as being highly religious, framing had no effect on the decision to resuscitate or to offer comfort care (OR: 1.16; 95% CI: 0.35–3.86; $P = .8$) (Fig 4).

DISCUSSION

Message framing was described by Tversky and Kahneman³⁶ as an explanation for the deviations in decision-making behavior predicted by the expected utility theory. Expected value maximization is frequently cited in rational choice theory as a model used to predict a person's course of action on the basis of an objective assessment of the value of an outcome. The value of an outcome within this theory is based on its objective worth multiplied by the probability of its occurrence. By definition, the way an option is framed does not change this objective worth or value, according to rational choice theory, and therefore should not influence decision-makers' preferences. Framing effects are well established, however, and choice theories have been developed to take these influences into account. For instance, the prospect theory proposes that the utility of a particular outcome may be altered by the frame of reference of a decision-maker. The prospect theory incorporates a subjective assessment of the overall utility of a decisional outcome. It is this subjective component that can be

TABLE 4 Univariate Analyses of Relationships of Possible Predictor Variables and Decision to Resuscitate

Independent Variable	P	OR (95% CI)
Positive frame	.053	1.72 (0.99–2.78)
Importance of autonomy	.475	1.23 (0.69–2.22)
Importance of preservation of life	<.001	4.17 (2.27–7.80)
Importance of quality of life	.236	0.55 (0.20–1.49)
Strong religious faith	.039	1.94 (1.03–3.65)
Marital status	.206	0.70 (0.4–1.22)
Parenthood	.088	1.61 (0.93–2.80)
Pregnancy	.307	0.46 (0.10–2.08)
Experience with premature infants	.294	0.74 (0.42–1.30)

influenced by the way in which information is presented or messages are framed.^{36–40}

Message framing has been studied in various contexts, with studies showing that the same information presented in 2 logically equivalent but opposite frames can yield different decisional outcomes.^{12,15–28,36–40} Disciplines in which message framing has been explored, other than psychology and economics, include oncology, public health preventative initiatives, obstetrics, and genetic testing.^{20–28,37} Armstrong et al²⁵ showed that presenting prognoses as either survival or mortality curves significantly affected not only individuals' understanding of risks but also treatment decisions with regard to imaginary disease states. Framing of cancer treatment outcomes as probabilities of survival or death also demonstrated framing effects for patient, nonpatient, and physician decisions regarding treatment options.²⁷ In the obstetric literature, negative or positive presentation of teratogenic risk information by telephone counselors not only altered women's perception of teratogenic risks but also influenced their likelihood of using over-the-counter medications during their pregnancy.²⁴ Finally, public health initiatives have structured health care messages to take advantage of framing effects in promoting behaviors such as safe sex practices, HIV testing, and sunscreen use.³⁷

Framing effects may potentially jeopardize informed consent. In the classic informed consent doctrine proposed by Beauchamp and Childress,⁴¹ 5 critical elements must be present for the process to be substantiated, namely, appropriate disclosure by the physician, comprehension by the patient, a voluntary relationship, capacity on the part of the patient, and an autonomous consent or decision-making process. An autonomous action or decision is by definition an action or decision that meets 3 conditions, that is, intentionality, understanding, and the absence of any controlling external influences.⁴¹ External influences such as message framing may compromise autonomy in decision-making and thereby compromise the integrity of the informed consent process.

Framing effects have not been investigated in neonatal populations and have not been investigated with respect to issues of life-and-death decisions. Much of the treatment decision-making literature in neonatology has focused on physician behavior and little on the parental decision-making process.^{42–58} A few studies have begun

TABLE 5 Multivariate Logistic Regression Analysis of Relationships of Effect Modifiers and Decision to Resuscitate

Independent Variable	df	P	OR (95% CI)
Positive frame	1	.043	1.82 (1.02–3.24)
Strong religious faith	1	.178	1.57 (0.81–3.08)
Importance of preservation of life	1	<.001	3.94 (2.09–7.46)
Parenthood	1	.344	1.33 (0.739–2.38)

Logistic regression model: resuscitation = B1 (intercept) + B2 (positive frame) + B3 (strong religious faith) + B4 (importance of preservation of life) + B5 (parenthood).

to investigate more thoroughly the prenatal consultation process through which decisions regarding resuscitation must be made. However, most of those studies have focused primarily on parental retention of information and satisfaction with the process.^{7,32,35,49,50,55–58} A thorough investigation of the actual resuscitation decision-making process is greatly needed. With the new guidelines put forth by the Neonatal Resuscitation Program, advocating for physician support of parental wishes and desires under conditions of extreme prematurity where outcomes are uncertain, efforts should be made to ensure that the information disclosed is unbiased, to support a decision-making process that is most consistent with the family members' moral framework and preferences.⁵⁹ The American Academy of Pediatrics^{1,2} also supports nondirective counseling to enable parents to make such decisions. A caveat inherent in the prescription of nondirective counseling involves circumstances in which the infant's best interests clearly outweigh any potential burdens that the infant may experience, thus overriding a parental right to autonomous decision-making. For instance, when the likelihood of survival without disability is high, it would be in the infant's best interest to provide resuscitation and intensive care. Conversely, when the burdens of resuscitation and intensive care clearly outweigh any potential benefits, the infant's best interests supersede parental decisional autonomy. In both cases, nondirective counseling would not be

appropriate, and it is our opinion that parents should not be offered a choice of treatment in such circumstances.

This study was designed to begin to evaluate the parental decision-making process and to address specifically whether message framing affects decisions to resuscitate. The study assessed whether presentation of the same information in 2 opposing fashions would alter decisions made by participants regarding treatment options for extremely premature infants born at 23 weeks of gestation. Multivariate analysis demonstrated a significant effect of framing on resuscitation decisions. This effect was modified by religiousness. Participants who were not highly religious were significantly more likely to be influenced to opt for resuscitation by the positive frame than were participants who were highly religious. One hypothesis to explain the increased susceptibility to framing of participants who were not highly religious is that framing has a greater impact on people whose beliefs and preferences are more ambiguous or not as well defined as those of people who are highly religious. These individuals may be more susceptible to subtle aspects of communication, which then influences their decisions. Alternatively, it may be hypothesized that people with predetermined preferences or a priori decisions (perhaps those who are highly religious) are less likely to conceptualize the problem as reflecting a choice and therefore are not as susceptible to framing.

Weaknesses of this study were that Internet-based survey methods were used, the context was not specific, the study might not have been powered sufficiently to detect significant relationships for all of the variables investigated, and demographic data were incomplete. In Internet-based studies, it cannot be determined whether participants were concentrating or were distracted while completing the questionnaire. Another limitation of Internet-based studies is that components of context that are inherent in prenatal consultations are not reproducible. For example, our participants completed the study within 15 minutes, on average, which may not be re-

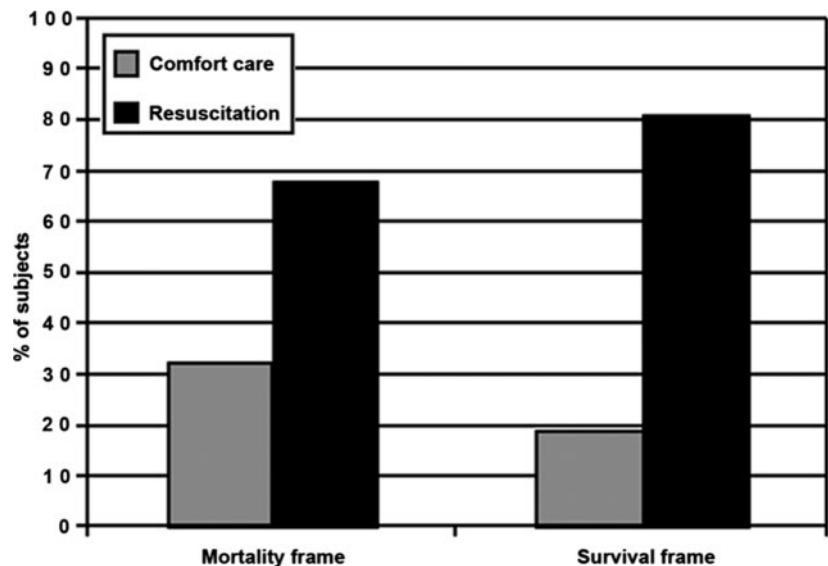
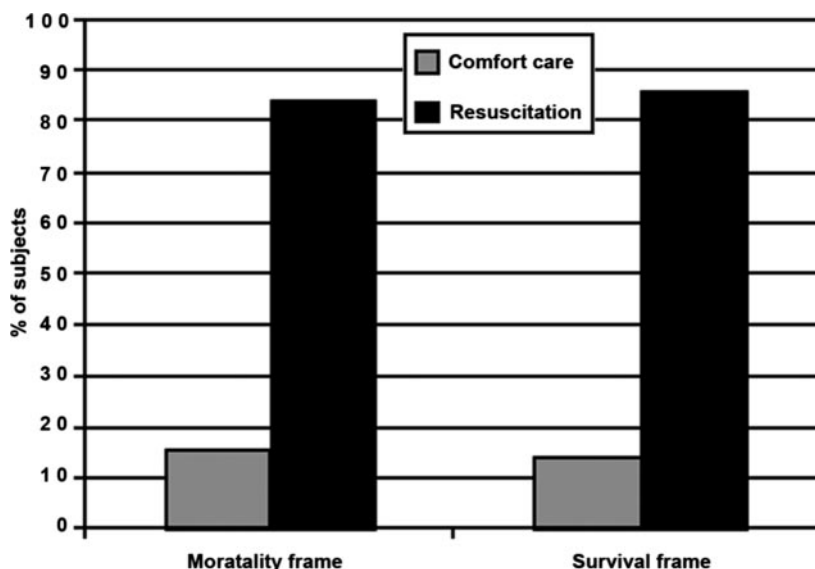


FIGURE 3 Percentage of nonreligious subjects ($n = 217$) choosing comfort care versus resuscitation, according to frame provided.

FIGURE 4
Percentage of religious subjects ($n = 75$) choosing comfort care versus resuscitation, according to frame provided.



flective of the lengthy discussions and deliberations that sometimes ensue during prenatal consultations. Conversely, completion of the survey within 15 minutes may indicate that this study evaluated heuristic decision-making or gut reactions, which is a decision style frequently used by individuals faced with complicated uncertain decisions.

The study was originally designed to be more context specific. However, as previously mentioned, the institutional review board requested that we first obtain data from nonpregnant participants. Most of our participants were female parents of childbearing age.

Finally, demographic data pertaining to education, gender, and age were not complete because of a server failure during the recruitment of new participants to the database. Demographic information was available for only two thirds of the sample. Given the randomized design, demographic characteristics are not likely to differ between the groups. However, incomplete demographic data precluded investigation of possible effects of age, gender, and education on framing susceptibility. Data on other characteristics that affect patients' medical understanding and decisions, such as ethnicity, experience with disability, and immigration status,^{18,26,34} also were not available for the sample. Lack of information about these characteristics may limit the generalizability of our findings.

Our study is 1 of the first to begin to explore issues related to parental decision-making about resuscitation at the extremes of prematurity. It clearly shows that an inherent bias may be communicated to participants when information is framed as data on survival and the absence of disability, in contrast to death and the presence of disability. This bias affects decision-making for a subset of participants. These findings confirm the importance of recognizing the individuality of patient perceptions and acknowledging the fact that counseling patients requires a degree of flexibility on the part of the physician.²⁶

As discussed by Faden and Beauchamp,⁶⁰ informed consent rests on the presumption of effective communication and understanding of disclosed information. Various aspects of communication, such as language barriers, inconsistent inferences between parties, variations in background knowledge, and framing, have shown to have effects on this process. Framing in particular can affect the interpretation of risk information and alter the balance of effective communication and intended understanding. If it is known that framing biases can affect decisions in a particular area, then health care professionals' choice of frame can, in certain instances, exert an intentional control over the communication process and subsequent decisional outcome. In this sense, framing affects informed consent in 2 ways, by compromising freedom from external control and compromising risk comprehension by the decisional party. The actual impact of these formulation or framing effects on particular decisions and individual parties may not always be clear, but cautionary measures should be taken to present information in a manner that maximizes understanding and freedom from external constraints.⁶⁰

Efforts should be made by physicians to avoid incorporating bias into the transfer of information during prenatal consultations if nondirective counseling is intended. It is not clear whether presenting the information as both survival and mortality rates in consultations would be sufficient to avoid this framing effect. In fact, there is a suggestion in the decision-making literature that presentation of information as survival and mortality rates more closely parallels the effect on decision-making observed with presentation of survival information alone than that observed with mortality information alone.²⁵ Additional work is necessary to explore ways in which framing bias can be avoided in prenatal consultations.

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ANTIBIOTIC ALLIGATOR

“Researchers searching for new antibiotics might get some aid from gator blood. Scientists are zeroing in on snippets of proteins found in American alligator blood that kill a wide range of disease-causing microbes and bacteria, including the formidable MRSA or methicillin-resistant *Staphylococcus aureus*. Previous experiments have revealed that gator blood extract cripples many human pathogens, including *E. coli*, the herpes simplex virus and some strains of the yeast *Candida albicans*. The serum’s antimicrobial power probably derives from protein bits called peptides. Widespread among reptiles and amphibians, several such germ-fighting peptides have been isolated from the skin of frogs in recent years. Many of these critters live in ‘sort of nasty places’ that are polluted, and gators probably eat all kinds of sick animals, comments Paul Klein, a reptile infectious disease specialist at the University of Florida College of Medicine in Gainesville. Fierce battles with prey and other gators can leave gaping flesh wounds—but the animals are fairly hardy. These peptides provide a first line of defense—important in the lower vertebrates, who have a slower antibody response than humans, says Klein.”

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