

# Predicting Participation in Ultrasound Hip Screening From Message Framing

Marjon Witting and Magda M. Boere-Boonekamp

*Department of Health Technology and Services Research  
University of Twente, Netherlands*

Margot A. H. Fleuren

*Department of Child Health  
TNO, Netherlands*

Ralph J. B. Sakkers

*Department of Orthopedics  
University Medical Center Utrecht, Netherlands*

Maarten J. IJzerman

*Department of Health Technology and Services Research  
University of Twente, Netherlands*

The use of ultrasound (US) screening for developmental dysplasia of the hip (DDH) is an innovation in preventive child health care in the Netherlands. What is not known is whether parents will accept this screening method and will actually participate in it. It is widely known that health behaviors can be influenced by the framing of information. The objective of this study was to examine the influence of a gain- versus loss-framed brochure on parental participation in US screening for DDH. In total, 4150 parents of infants born between August 2007 and December 2008 received either a gain-framed or a loss-framed brochure. Parents could participate in the screening when their infant was 3 months old. The participation rate in the US screening was 74.3%. In contrast to the predictions of prospect theory, the results indicated that parents who had received the gain-framed message were more likely to participate in the screening compared to parents who had received the loss-framed message. This effect may be explained by the low risk perception of parents and by the possibility that the screening was perceived as a health-affirming behavior rather than an illness-detecting behavior. To increase participation rates, it is recommended that parents be informed about the positive aspects of partaking in screening for DDH.

Developmental dysplasia of the hip (DDH) is a common disorder in early childhood that can cause disability if left untreated. Different screening strategies are used to detect and start treatment for DDH at an early phase, allowing for optimal development of the hip. Worldwide, identification

of risk factors and physical examination for DDH are standard practice. However, ultrasound (US) screening has been adopted as the regular form of screening in several German-speaking countries (Dorn & Neumann, 2005). In the Netherlands, screening for DDH in the first 6 months of life is part of the child health care (CHC) disease prevention program and is based on a physical examination and the identification of risk factors.

US screening was introduced in the early 1980s by Graf (1980). Since then, many studies have been performed to

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Correspondence should be addressed to Marjon Witting, Department of Health Technology and Services Research, University of Twente, PO Box 217, 7500 AE Enschede, Netherlands. E-mail: m.witting@alumnus.utwente.nl

investigate its effectiveness. Several positive effects of US screening have been reported, including decreased overall treatment rates (Treiber et al., 2008), a shorter duration of treatment (Theis & Vane, 2003), and a reduction in surgeries (Clegg, Bache, & Raut, 1999; Treiber et al., 2008; Von Kries et al., 2003). To investigate whether US screening for DDH is preferable to the routine screening program, a large prospective cohort study was performed (Roovers, Boere-Boonekamp, Castelein, Zielhuis, & Kerkhoff, 2005). Universal US screening at the age of 3 months, compared to the current screening method (identification of risk factors and physical examination), turned out to be more effective because of a lower rate of missed cases and a low referral rate.

Based on these positive results, a follow-up study was designed to examine the feasibility in daily practice and cost-effectiveness associated with the introduction of US screening for DDH in CHC centers in the Netherlands. In this follow-up study, more than 4000 parents of 3-month-old babies were invited to participate in the US screening during an extra visit to the CHC center. We were particularly interested in the actual participation rate and the measures that could be used to increase parental participation rates. One such approach is the use of message framing.

The influence of message framing has been extensively studied in social research. By varying the content of a message in a positive or negative way, people's preferences can be influenced. Prospect theory assumes that when faced with a choice that implies a gain, people tend to be risk-averse. On the other hand, people prefer risk-taking behavior when faced with a loss-framed choice (Kahneman & Tversky, 1979; Tversky & Kahneman, 1981). The concept of message framing can also play a role in predicting health behaviors. A distinction is often made between detection (e.g., breast self-examination) and prevention (e.g., using sunscreen to prevent skin cancer) health behaviors (Rothman & Salovey, 1997). Detection behavior implies a risk-taking behavior because a health problem can be revealed by performing the behavior. Although the long-term outcomes are often very beneficial, the fear of finding a health problem in the short term can be high (Cox & Cox, 2001). Prevention behavior is far less risky, as people maintain their current health situation without directly facing negative consequences. In line with prospect theory, the performance of detection behaviors should be more effective when using loss-framed messages (i.e., disadvantages or costs), and performance of prevention behaviors could be stimulated by the use of gain-framed messages (i.e., advantages or benefits) (Rothman & Salovey, 1997; Rothman, Salovey, Antone, Keough, & Martin, 1993).

Several studies, mainly focusing on (self) detection of breast cancer, have shown the positive effect of loss-framed messages on the performance of detection behaviors. Banks et al. (1995) found that women who attended a video presentation about the importance of mammography screening for the early detection of breast cancer were more likely

to have a mammogram if the video presentation was loss-framed compared to women who watched the gain-framed video presentation. In addition, women who read a loss-framed pamphlet revealed more positive attitudes, intentions, and behavior regarding breast self-examination than women who read a gain-framed pamphlet (Meyerowitz & Chaiken, 1987). Similar results were found in a study by Williams, Clarke, and Borland (2001), in which a loss-framed message led to an increase in perceived susceptibility for breast cancer and a positive change in performance of self-examination. Women who had never performed breast self-examination were more likely to perform the screening after reading a loss-framed message compared to women who read a gain-framed message. Finally, Rothman, Martino, Bedell, Detweiler, and Salovey (1999) found that a loss-framed pamphlet promoting the use of disclosing rinse to detect plaque was more effective than the use of a gain-framed message.

Gain-framed messages are believed to positively influence preventive health behaviors. For example, in a study by Rothman et al. (1999) that focused on dental health, a gain-framed message proved to be more effective when the use of mouth rinse was promoted to prevent plaque. Rivers, Salovey, Pizarro, Pizarro, and Schneider (2005) found that in screening for cervical cancer, women were more likely to obtain a Pap test if the detection characteristics of a Pap test were paired with a loss-framed message and if the prevention aspects were paired with a gain-framed message. In relation to skin cancer, a positive effect of gain-framed messages was found on intentions to use a sufficient level of sun protection factor (SPF), sunscreen requests, and applying sunscreen repeatedly (Detweiler, Bedell, Salovey, Pronin, & Rothman, 1999). This effect was particularly noticeable among people who had not intended to use sunscreen. Other research found that repeated exposure to messages emphasizing the benefits of engaging in physical activity resulted in greater physical activity compared to exposure to loss-framed messages (Latimer et al., 2008).

Despite the widely held belief that loss-framed messages are more persuasive in encouraging detection behaviors and gain-framed messages are more effective in stimulating prevention behaviors, O'Keefe and Jensen (2007; 2009) were not able to confirm this contention in two meta-analyses. In their most recent review (O'Keefe & Jensen, 2009), only a negligible significant effect ( $r = -.04$ ) of loss-framed messages on detection behaviors was found, and this effect was largely attributable to breast cancer detection behaviors. In the other meta-analysis (O'Keefe & Jensen, 2007) of the effects of message framing on disease prevention behaviors, they found similar results. The positive effect of gain-framed messages on prevention behaviors was statistically significant, but was very small ( $r = .03$ ) and resulted mainly from the effects of preventive dental hygiene behaviors.

The results of these meta-analyses seem disappointing in the light of the effectiveness of different message frames on

people's health behaviors. However, for a population based screening method, like the US screening for DDH, to be (cost) effective, it is desirable that participation rates are optimal. Even though the effect of message frames seems to be small, this effect can, in a population-based screening, make a substantial contribution to the participation of the target population. In addition, the framing of information brochures is a relatively easy way to increase participation rates in screening programs.

The aim of the present study was to analyze the influence of gain- and loss-framed messages on parental participation in the US screening for DDH in preventive CHC. Partaking in the screening for DDH may be considered a risky behavior since an abnormality can be detected. Therefore, based on prospect theory, we expected a positive relation between loss-framed information and participation in the screening for DDH. With the results of this study, realistic expectations of the effects of message framing on participation in the US screening can be developed. In addition, the results may contribute to the decision-making process concerning information provision to parents of newborns in preventive CHC.

## METHOD

### Design

Two information brochures, one gain-framed and one loss-framed, were developed for this field experiment, inviting parents of newborns to the US screening. Participation in the screening was the main outcome variable of this study. As a manipulation check on the framing conditions, parents received a questionnaire in which they could evaluate the brochure on positivity and negativity.

### Procedure

Recruitment of the parents and performance of the screening was carried out by two CHC organizations, one of which was situated in a rural area (organization A) and the other in an urbanized area (organization B). The screening in organization A took place in different villages. The screening locations in organization B were two inner-city areas and three new suburban areas.

Parents received the information brochure at their first well-child visit to the CHC center when their baby was 1 month old. They could read the brochure at home and decide whether they wanted to participate. At the age of 2 months, an appointment was made for the screening. The screening was performed at the age of 3 months. The invitation strategy was based on the regular way of inviting parents in the CHC organizations. In organization A, parents received an invitation letter for the US screening at home, including a date, time, and location. Parents had to contact the CHC organization in case they wanted to change the date or if they did

not want to participate (opting out). In organization B, the assistant asked parents visiting the CHC center for a regular well-child visit whether they wanted to participate in the screening. If the parents agreed to participate, an appointment was made (opting in). Participation in the screening was voluntary and all the parents signed an informed consent form.

To control for other organizational factors that possibly influenced participation rate (e.g., the service area of the organizations and the method of making appointments), the organizations distributed the gain-framed and the loss-framed brochures separately at different periods of time. It was randomly decided that organization A would distribute the gain-framed brochure from September 2007 up to May 2008, followed by the loss-framed brochure from July 2008 up to January 2009. Organization B handed out the loss-framed brochure from September 2007 up to May 2008 and subsequently the gain-framed brochure from July 2008 up to January 2009. In both organizations, the brochures were replaced by the other version in June 2008.

### Population

Parents of 4150 newborns born in the period August 2007 to December 2008 participated in the message framing study. These parents were invited to take their infant for an US screening for DDH. Registration of (non)participation of the parents was performed by the CHC organizations.

A total of 4150 brochures were distributed, of which 2043 were gain-framed and 2107 were loss-framed. In organization A, 1924 parents received an information brochure, of which 1062 (55.2%) were gain-framed and 862 (44.8%) were loss-framed. In organization B, the brochure was handed out to 2226 parents, of which 981 (44.1%) were gain-framed and 1245 (55.9%) were loss-framed.

### Information Brochures

Brochures were developed to inform parents about DDH and the US screening. Results from a focus group of parents with newborns with whom the requirements concerning the content and the layout of the brochures had been discussed were used in developing the brochures. The characteristics emphasized by the parents were the conciseness of the brochure, the readability of the language, and the presence of some pictures. Based on these results, information in the brochure was provided on DDH in general (e.g., pathogenesis, prevalence, medical consequences, and treatment), screening methods, the procedure during the US screening, and the project itself. The form of the brochures was finalized after the concept brochures had been assessed several times by different individuals from different disciplines and populations, including parents.

The managers of the CHC organizations were consulted about the desirability of translating the brochures into other

TABLE 1  
Message Framing Arguments

<i>Gain-Framed Message</i>	<i>Loss-Framed Message</i>
A possible hip abnormality is often easier to treat if it is discovered in time.	A possible hip abnormality is often more difficult to treat if it is not discovered in time.
The chances of complete recovery are higher if the hip abnormality is discovered in time.	The chances of permanent injury are higher if the hip abnormality is not discovered in time.
The hip joint develops normally in about 97% of the infants.	The hip joint does not develop normally in about 3% of the infants.
If an infant with a hip abnormality is treated in an early phase, this decreases the chance that he/she will have difficulty with walking and standing.	If an infant with a hip abnormality is treated in a late phase, this increases the chance that he/she will have difficulty with walking and standing.
There is a lower chance that, as a young adult, he/she will limp and have degenerative joint disease.	There is a higher chance that, as a young adult, he/she will limp and have degenerative joint disease.
If you perform an ultrasound screening of the hip of your infant, there is a higher chance of discovering a possible hip abnormality in time.	If you do not perform an ultrasound screening of the hip of your infant, there is a lower chance of discovering a possible hip abnormality in time.
The younger the baby is when diagnosed and the start of the treatment, the less complicated/intrusive and shorter the treatment can be.	The older the baby is when diagnosed and the start of the treatment, the more complicated/intrusive and longer the treatment can be.

languages, such as Turkish and Moroccan. All the managers stated that, in their organization, general information provision to parents was given in Dutch. To conform with the current policy on information provision by the CHC organizations, the brochures in this study were therefore only available in Dutch.

There were, in total, seven gain and loss variations in the brochure. The gain-framed and loss-framed arguments included in the brochures are presented in Table 1. The brochure was double-sided, A4 in size, and printed in color.

### Manipulation Check

To check whether the intended message (either gain-framed or loss-framed) was well received, parents answered two questions. The manipulation check was part of a larger questionnaire survey concerning the feasibility of implementation of the US screening for DDH. Parents were first asked if they were aware of the information brochure. They were presented with four options: (1) No, I do not know the brochure. (2) Yes, I know the brochure but I never read it.

(3) Yes, I read the brochure superficially. (4) Yes, I read the brochure in depth. Subsequently, parents were asked to evaluate the positivity and negativity of the brochures on a 5-point scale varying from (1) *very negative* to (5) *very positive*. Both participating and nonparticipating parents received the questionnaire and were asked to return it within 2 weeks. A reminder letter was sent after this period.

The questionnaire was given to a sample of 1140 parents participating in the screening. The sample size of the participating parents was based on a power calculation made for the larger questionnaire survey. The screener handed out the questionnaire after the screening in May and June 2008 and in November and December 2008 in the two organizations, which made it possible to correct for variations during the year. In addition, all 1057 nonparticipants received the questionnaire. Since the group of nonparticipants was expected to be much smaller than the group of participating parents, it was decided not to take a sample of this group. Nonparticipating parents received the questionnaire at home, when their infant was aged 6 months.

In total, 703 questionnaires of the participating parents were returned (response 61.7%). The response rates in organization A and B were 68.7% (427/622) and 53.3% (276/518), respectively. The overall response rate for the nonparticipating parents was 37.2% ( $n = 393$ ). In organization A the response rate was 46.6% (123/264) and in organization B 34.0% (270/793).

### Measures and Analyses

The main outcome of this study was the participation rate of the parents in the US screening program. To measure the influence of the message frame on participation, an odds ratio was calculated and tested using logistic regression. Logistic regression analysis was also used to control for the organization in which the screening took place and to test for interaction effects. A chi-squared test was performed to analyze differences in participation between the two organizations. A chi-squared test was also performed to determine if the message provided in the brochures was received as intended.

## RESULTS

### Manipulation Check

Of the parents who filled in the questionnaire ( $n = 1096$ ), 408 parents stated that they had not received or read the brochure: 292 (71.6%) parents did not know the brochure, and 116 (28.4%) parents knew the brochure but never read the information. The brochure was read by 681 parents: 468 (68.7%) of them read the information superficially, and

213 (31.3%) thoroughly. No data were available from seven parents.

Parents who had read the brochure evaluated the positivity/negativity of the brochures with a mean score of 3.93 ( $SD = 0.74$ ). After reducing the 5-point scale into a 3-point scale, a chi-squared test showed that the message frame did not significantly influence ( $p > .05$ ) the evaluation of positivity and negativity of both brochures. Of the parents who received the gain-framed brochure, 75.8% evaluated the brochure as positive and 23.2% as neutral. The outcomes of the parents who had received the loss-framed brochure were almost the same as that of the gain-framed brochure, with 74.9% of them perceiving the brochure as positive and 22.7% as neutral.

### Participation in the Screening

The participation rates in each organization are presented in Table 2. In total, 3085 of the invited 4150 parents participated with their infant in the US screening, leading to a participation rate of 74.3%. Participation rates differed significantly between the two organizations ( $\chi^2 (1, n = 4150) = 617.78, p < .001$ ). In organization A (situated in a rural area), 1779 of the 1924 parents participated, leading to a participation rate of 92.5%. In organization B (situated in an urban area), the participation rate was 58.7%, with 1306 out of 2226 parents partaking in the screening.

The results of the logistic regression are presented in Table 3. There was a significant impact of message type on actual participation in the US screening. Parents who received the gain-framed brochure were 1.42 times (unadjusted OR) more likely to participate in the screening than parents who received the loss-framed brochure (model 1). In total, 77.7% of the parents who had received the gain-framed message, did participate in the screening. Of the parents who had received the loss-framed message, 71.0% participated. When calculating the odds ratio per organization, differences emerged. In organization A, no significant association was found between message type and participation (model 2). In organization B, a small significant effect of the message frame on participation was found ( $OR = 1.18$ ) (model 3). When adjusting the influence of the message on participation for "organization" (model 4), the chances of participation after receiving a gain-framed brochure still remained significant but decreased to 1.20. The organization proved to be a

strong predictor, in that parents visiting organization A were significantly more likely to participate in the screening compared to parents visiting organization B ( $OR = 8.49$ ). We did not find an interaction between organization and message type (model 5).

## DISCUSSION

This study demonstrates the effect of message type on parental participation rate in the US screening for DDH. The gain-framed brochure had a more positive effect on parental participation than the loss-framed brochure. This effect was the reverse of what was expected, since effectiveness of detection behaviors is often associated with the positive influence of loss-framed messages.

The first reason for the positive influence of the gain-framed brochure on parental participation might be the low risk perception of parents regarding DDH. Detection behaviors are often associated with a risk, in that a serious disease can be revealed by engaging in the behavior. Since treatment can be very effective if DDH is diagnosed at an early stage, parents might not perceive the screening as very risky. Given that (perceived) risk is considered an important reason for the effectiveness of message frames (Abhyankar, O'Connor, & Lawton, 2008; Apanovitch, McCarthy, & Salovey, 2003; Gerend & Shepherd, 2007; O'Connor, Ferguson, & O'Connor, 2005; Rothman et al., 1993), the low risk perception might have diminished the effect of the loss-framed message and might have strengthened the influence of the gain-framed message on parental participation.

Another reason for the positive effect of the gain-framed message might be the perceived function of the behavior. Rothman and Salovey (1997) state that health behaviors can serve multiple functions; for example, self-screening on breast cancer can be considered an illness-detecting behavior, but also a health-detecting or health-affirming behavior. Women who perceive breast cancer screening as a health-detecting behavior instead of an illness-detecting behavior could benefit more from a gain-framed message instead of a loss-framed message. The same holds true for the parents in this study; if they perceive US screening for DDH as a way of affirmation of the health of their infant, a gain-framed message could influence participation positively.

TABLE 2  
Participants and Nonparticipants in the US Screening for DDH Based on Message Type and Organization

	<i>Organization A (N = 1924)</i>		<i>Organization B (N = 2226)</i>		<i>Total (N = 4150)</i>	
	<i>Participants</i>	<i>Nonparticipants</i>	<i>Participants</i>	<i>Nonparticipants</i>	<i>Participants</i>	<i>Nonparticipants</i>
Gain-framed message	990 (93.2%)	72 (6.8%)	598 (61.0%)	383 (39.0%)	1588 (77.7%)	455 (22.3%)
Loss-framed message	789 (91.5%)	73 (8.5%)	708 (56.9%)	537 (43.1%)	1497 (71.0%)	610 (29.0%)

Note. Percentages are based on participants and nonparticipants within each message frame.

TABLE 3  
Logistic Regression Predicting Participation in US Screening  
for DDH ( $N = 4150$ )

Predictor Variable	<i>b</i>	<i>SE</i>	<i>Odds Ratio</i>	<i>95% CI</i>
Model 1				
Message	.35 <sup>b</sup>	.07	1.42	1.24–1.64
Model 2				
Message (organization A)	.24	.17	1.27	0.91–1.79
Model 3				
Message (organization B)	.17 <sup>a</sup>	.09	1.18	1.00–1.40
Model 4				
Message	.18 <sup>a</sup>	.08	1.20	1.03–1.40
Organization	2.14 <sup>b</sup>	.10	8.49	7.03–10.27
Model 5				
Message	.17 <sup>a</sup>	.09	1.18	1.00–1.40
Organization	2.10 <sup>b</sup>	.14	8.20	6.29–10.68
Message × organization	.07	.19	1.07	0.74–1.57

<sup>a</sup>Significant at  $p \leq .05$ .

<sup>b</sup>Significant at  $p \leq .001$ .

The multiple ways parents can perceive the US screening might explain the results found in this study. However, since we do not have insight into parents' risk perception regarding the screening and since we did not ask them to assess the US screening as an illness- or health-affirming behavior, we should also consider the possibility that prospect theory might not be very satisfactory in predicting screening participation. No support was offered for the general belief that detection behaviors, through which a health outcome can be confirmed or disconfirmed, might profit more from a loss-framed message than from a gain-framed message. This is in keeping with the meta-analyses by O'Keefe and Jensen (2007, 2009), in which they found statistically significant but very weak correlations for the overall advantage of message framing on health behaviors. Future research would benefit from identifying which characteristics of the detection behavior, such as perceived risk, and the message can strengthen each other, so that participation in screening activities may be optimized.

The effect of the gain-framed message on participation rate differed between the two organizations. It is reasonable to expect that the effect of the gain-framed message decreases with a higher participation rate. In organization B, in which the participation rate was already low, the benefits of using a gain-framed message are probably higher than in organization A, in which the participation rate almost reached its ceiling. However, even in organization A, the usage of a gain-framed message still resulted in an increase of 1.7% on the participation rate. In light of implementing the screening on a population based level, this effect should be taken seriously.

To confirm whether the gain-framed and loss-framed messages came across as intended, a manipulation check

was carried out. The results of this evaluation demonstrated that parents did not perceive the brochures as two extremes. This lack of perceived contrast adds ambiguity to the interpretation of the results. However, it is reasonable to expect that the long period between the handing out of the brochure and the evaluation of the brochure might account for this difference. Since memory for information provided by health care practitioners is often poor (Kessels, 2003), it is not very surprising that parents could not remember the brochure very well and so could not provide an accurate evaluation of the brochure. Therefore, while it seems that the manipulation check did not provide the expected outcome, it is plausible that this did not influence the results in such a way that they become questionable.

Participation rates differed significantly between the two organizations. The participation rate of 92.5% in organization A, situated in the rural area, is comparable to the national average of 95% for regular CHC well-child visits (Verbrugge, 1990; Verloove-Vanhorick & Reijneveld, 2007). In organization B, situated in the urban area, there was a relatively low participation rate of 58.7%, which is far below the national average. The location of the CHC organizations and the procedures within the organizations can probably explain part of the variance in the participation rate. Ethnicity, for example, might be a reason for the lower participation rate in the urban area. It is well known that there are inequalities in the use of health care services between immigrant groups and the indigenous population (Stronks, Ravelli, & Reijneveld, 2001). Poor language skills and ineffective communication can account for these differences in health care usage (Scheppers, Van Dongen, Dekker, Geertzen, & Dekker, 2006). Fassaert, Hesselink, and Verhoeff (2009) also conclude that mastery of the language is essential to the usage of health care services and place emphasis on assisting and educating immigrants. Since the brochures used in this study were formulated in Dutch, this could have been a reason for the lower participation rate in the urbanized area. However, ethnicity might not only account for differences in participation. For example, Frenken (2005) found that there were almost no differences between immigrants and the indigenous population in regular well-child visits to the CHC center. Nevertheless, since this screening method and the corresponding information provision are new in preventive CHC, language problems might have had a higher impact on participation.

A further reason for the differences in participation rate might be the way the parents were approached. In organization A (rural area), parents received a detailed invitation with an appointment at home. They did not have to do anything, unless they did not want to participate (opting out) or if they wanted to change the date of the screening. In organization B (urban area), the assistant asked the parents if they wanted to participate in the screening and if they agreed, an appointment was made (opting in). This might have looked more noncommittal than receiving a clear

invitation. In general, opting out is more effective for the recruitment of people, as has been demonstrated for organ donations (Kokkedee, 1992) or for getting informed consent (Mutch & King, 1985). The opting out approach used in organization A might partly explain the higher participation rate.

This study benefited from the measuring of the actual behavior of parents as an outcome variable, instead of the intention to perform the behavior. However, it also suffered from some limitations that should be mentioned. First, we only looked at the effect of message frame on participation rate. Previous research has identified several factors that might mediate or moderate framing effects, such as perceived outcome efficacy (Abhyankar et al., 2008), perceived certainty of the outcome (Apanovitch et al., 2003), involvement (Cox & Cox, 2001; Rothman et al., 1993), avoidance motivation (Gerend & Shepherd, 2007), and personal outcome effectiveness (Ferguson & Gallagher, 2007). On the contrary, there are also studies in which little support is found for (cognitive) factors that might mediate or moderate framing effects (Meyerowitz & Chaiken, 1987; O'Connor et al., 2005; Williams et al., 2001). Although the effects of mediating and moderating factors are ambiguous, the influence of message frame on participation in this study might possibly have been stronger if (a selection of) these factors had been taken into account.

Second, we do not know if and what extra information was provided at the CHC center by the CHC physician, CHC nurse, or assistant. Complementary oral information can probably influence parental participation. Segura et al. (2001) found that direct contact with professionals can increase participation rates by 15–20% compared to mailed letters in mammography screening. The authors state that direct contact makes it possible to tailor the information to the needs of the people concerned. To increase participation at mammography screening, McCaul and Wold (2002) also suggest the use of tailored messages. Differences in the direct communication with parents between the organizations could have influenced participation.

Third, the design of this field study makes it inevitable that not all 4150 parents remembered receiving or reading the brochure. This can be explained by the long period between receiving the brochure and filling in the questionnaire, but it can also be expected that it reflects practice as usual in (child) health care. Although the study design did not allow for exclusion of all the parents who did not read the brochure, it might be expected that this study is a realistic reflection of the way parents deal with information they receive and that they do not always read the information provided. With regard to CHC, this shows the importance of careful consideration of the distribution of information to parents of newborns to increase the participation rate. CHC professionals should think about when and how to distribute the information and how to stimulate parents to actually read the information.

Finally, if parents did not participate in the US screening, care as usual was provided, meaning parents did not “lose” anything if they did not visit the screening with their infant, except for an extra checkup. If US screening for DDH is implemented in the future, this method will replace the current screening method and will become an integral part of preventive CHC. This means that if parents want the hips of their infant to be examined, they have to visit the screening since this has become the care as usual. This will presumably influence participation positively.

The findings presented in this article have practical implications for communication with parents in preventive CHC. Our findings suggest that the use of a gain-framed information brochure might lead to a higher participation rate in US screening for DDH. Therefore, when creating information brochures for US screening the focus should be on the advantages of participating in the screening for the infants (and parents), while loss-framed arguments should be avoided whenever possible. The current research also emphasizes the importance of effective information distribution to parents. The team of CHC professionals should monitor the process to ensure that all parents receive the available information and should stimulate parents to read the information. Finally, to optimize techniques for approaching and inviting parents for the screening, CHC organizations should take into account the characteristics of the service area and of the parents.

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