When Feedback Backfires: Influences of Negative Discrepancies Between Physicians' Self and Assessors' Scores on Their Subsequent Multisource Feedback Ratings

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When Feedback Backfires: Influences of Negative Discrepancies Between Physicians' Self and Assessors' Scores on Their Subsequent Multisource Feedback Ratings

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Introduction: With multisource feedback (MSF) physicians might overrate their own performance compared with scores received from assessors. However, there is limited insight into how perceived divergent feedback affects physicians' subsequent performance scores.

Methods: During 2012 to 2018, 103 physicians were evaluated twice by 684 peers, 242 residents, 999 coworkers, and themselves in three MSF performance domains. Mixed-effect models quantified associations between the outcome variable "score changes" between first and second MSF evaluations, and the explanatory variable "negative discrepancy score" (number of items that physicians rated themselves higher compared with their assessors' scores) at the first MSF evaluation. Whether associations differed across assessor groups and across a physician's years of experience as a doctor was analyzed too.

Results: Forty-nine percent of physicians improved their total MSF score at the second evaluation, as assessed by others. Number of negative discrepancies was negatively associated with score changes in domains "organization and (self)management" ($b = -0.02$; 95% confidence interval [CI], -0.03 to -0.02 ; SE = 0.004) and "patient-centeredness" ($b = -0.03$; 95% CI, -0.03 to -0.02 ; SE = 0.004). For "professional attitude," only negative associations between score changes and negative discrepancies existed for physicians with more than 6-year experience ($b_{6-10\text{yearsofexperience}} = -0.03$; 95% CI, -0.05 to -0.003 ; SE = 0.01; $b_{16-20\text{yearsofexperience}} = -0.03$; 95% CI, -0.06 to -0.004 ; SE = 0.01).

Discussion: The extent of performance improvement was less for physicians confronted with negative discrepancies. Performance scores actually declined when physicians overrated themselves on more than half of the feedback items. PA score changes of more experienced physicians confronted with negative discrepancies and were affected more adversely. These physicians might have discounted feedback due to having more confidence in own performance. Future work should investigate how MSF could improve physicians' performance taking into account physicians' confidence.

Keywords continuing professional development, multisource feedback, performance improvement, physicians' professional performance, score changes, experience, workplace-based assessment

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The evaluation of physicians' competence and performance is a key issue in current research and policy agendas.¹⁻⁴ This is not surprising, given that high-quality patient care needs high-performing physicians, which asks for regular evaluation. Workplace-based assessment methods enable the regular evaluation of physicians' professional performance in daily practice.⁵ One popular method is the use of multisource feedback (MSF), where information about a physician's professional performance is collected using items rated by multiple assessors and assessor groups,⁶⁻⁸ such as peers, coworkers, patients, and the physicians themselves. These combined evaluations from multiple groups are essential as the goal is to assess physicians' integral professional performance, consisting of the complex and integrated interplay between the use of knowledge, skills, attitudes, and values.⁹⁻¹¹ The collected feedback is believed to help physicians improve their professional performance because it can reveal shortcomings in current performance, while current performance can also be praised.¹²⁻¹⁴ Indeed, follow-up research on physicians who participated in MSF showed positive results: physicians reported to have changed their performance after receiving and reflecting upon feedback.¹⁵⁻²⁴

However, the effect of MSF can be 2-fold: it can be constructive and destructive.²⁵ The extent of MSF's effect on physicians' practice depends on numerous factors such as the characteristics of feedback, feedback recipients, and feedback providers.^{6,14,18,21,25,26} When receiving MSF, physicians can be confronted with feedback that is incongruent with their own performance beliefs. These discrepancies can either be positive when the self-assessment scores turn out to be lower than the scores received from assessors or negative, in which the self-assessment scores are higher than assessors' scores. Especially, negative discrepancies between self-assessment scores and assessors' assessment scores could affect physicians' subsequent performance. These discrepancies may stimulate physicians in undertaking actions for performance change because they reveal current, unknown, performance gaps. Alternatively, when confronted with too many negative discrepancies, physicians' acceptance of feedback might become challenging due to emotional responses.²⁷⁻²⁹

Furthermore, feedback recipients' confidence, experience, and how credible they perceive the feedback source also influence the acceptance of incongruent feedback.^{20,26-28,30,31} The right amount of confidence creates opportunities to accept potentially threatening appraisals, yet too much confidence creates tension in accepting feedback that is incongruent with one's perception.²⁶ Feedback recipients' experience is directly linked to this confidence: the more experienced, the more confident.²⁶ Furthermore, accepting incongruent feedback is also affected by the perceived credibility of the feedback source. If the assessor is not deemed credible, acceptance of feedback becomes challenging as well.²⁶⁻²⁸ This source's credibility is related to the type of assessor group, and the type of performance domain this assessor assesses. Physicians are more likely to accept feedback on clinical competence from assessors who are indeed capable of commenting on clinical competence.³¹

Multiple factors can influence the uptake and acceptance of MSF and exploring these influences can assist physicians in their continuous professional development. One of these

influencing factors is the incongruence between self-assessment scores and those of other assessors. Until recently, little is known about the association of negative discrepancies with physicians' actual MSF score changes. Because MSF ratings provided by colleagues often poorly correlated with self-ratings, it is specifically interesting to look at how negative discrepancies influence physicians' score changes in MSF.²⁷ To get a grasp of this, possible association requires investigating the factors that might moderate or explain these associations, such as physicians' experience and the different assessor groups. Knowing how negative discrepancies influence physicians' subsequent MSF scores is crucial to tailoring the MSF in helping physicians accept incongruent feedback.^{32,33} Therefore, this study examined the associations of negative discrepancies of physicians' self-assessment scores and the scores they received from assessors with their score changes in subsequent MSF evaluations. The current study specifically addressed the following questions: (1) Are negative discrepancies between physicians' self-assessment scores and assessors' scores associated with score changes in a subsequent MSF evaluation? (2) Do physicians' years of experience and the feedback source modify these possible associations? This longitudinal observational study could give further insights into the potential contributions of MSF to the evaluation and improvement of physicians' professional performance.

METHODS

Study Setting and Design

This observational retrospective study was conducted in the Netherlands, where physicians participated in a performance appraisal process between 2012 and 2018 using MSF. Since 2008, physicians' participation rate in MSF evaluation, but not their scores or rankings, has been monitored and published to the public by the Dutch Inspectorate of Health. Dutch physicians are encouraged to participate in an MSF performance appraisal process and can select from various MSF instruments for this purpose. Physicians who chose to evaluate their performance using the validated MSF instrument "INviting Coworkers to Evaluate Physicians-Tool" (INCEPT)³⁴ were made aware that their data could be used for research purposes. The INCEPT tool was developed as a cocreation of researchers and practicing physicians to support physicians' professional performance improvement, first, by providing the MSF scores to the evaluated physician and, second, by conducting research upon physicians' performance data resulting from this tool.

The Institutional Review Board of the Amsterdam University Medical Centers, location AMC, provided a waiver of informed consent for this study.

Participants and Data Collection

Between 2012 and 2018, 2413 Dutch physicians from multiple hospitals and departments participated in the MSF program with the validated INCEPT instrument. Data collection of evaluated physicians occurred online; data were exported anonymously to the primary researcher by a trusted third party. The trusted third party, Empirion/Medox.nl, is the web developer of the tool and is the only entity that collects and has access to the MSF data. Legal agreements per Dutch law on

participants' privacy have been made with Empirion/Medox.nl about the anonymity and export of the data. For this study, 103 physicians were included, as these physicians participated twice (in the same role/discipline as medical specialist) in the MSF program between 2012 and 2018, assessed themselves at both time points, and had received sufficient evaluations from all respondent groups on both evaluations for reliable MSF scores. Previous research determined that a minimum of three residents, three peers, and four coworkers are needed for a reliable average score using a SEM of 0.26.³⁴ SEM can be used to create a confidence interval (CI) around scores.³⁵ An SEM value of 0.26 was set as the smallest allowable value for a 95% CI interpretation ($1.96 \times 0.26 \times 2 \approx 1$), representing a 95% CI of ± 0.5 around the average score.^{36,37} At both time points, physicians collected their feedback data within one month, by selecting and inviting assessors to provide anonymous feedback on their performance using the INCEPT MSF tool in an SSL-certified web-based environment. Physicians were instructed to invite at least eight peers (medical colleagues), eight coworkers (other health care professionals, such as nurses and [paramedical] assistants), and eight residents to evaluate them. These assessors were contacted per email, stressing the formative purpose and the confidential, anonymous, voluntary character of the evaluation. The physicians were asked to self-evaluate their performance as well using the same questionnaire and to provide information about themselves, such as age, gender, experience (years certified as medical specialist), and years of employment as a medical specialist. When more than four assessors per assessor group provided feedback, physicians received a personalized feedback report at the end of the MSF evaluation period. This feedback report contained anonymized aggregated scores per assessor group, narrative comments per assessor group, and physician's self-assessment scores. Within this report, aggregated assessor and self-assessment scores were graphically depicted for each feedback item, showing the discrepancy between physicians' self-assessment and others' scores (see Figure 1, Supplemental Digital Content 1, <http://links.lww.com/JCEHP/A114>). Physicians reviewed their report and identified areas for improvement accompanied by a formal follow-up with a facilitator outside of the organization or clinical department. The facilitators encouraged and supported physicians to use the feedback for developmental goals. The feedback report was sent to the physician only; neither head of departments nor external institutions such as the health inspectorate received the report. The reports were meant to be used as formative feedback and not have a role in any (high-stakes) decisions.

Measurements

Outcome Variables

The primary outcome variable in this study was physicians' "score change" between the first MSF evaluation (time 1) and the second MSF evaluation (time 2). This continuous variable ranges from -4 to 4 , with negative values indicating that time 2 scores declined compared with time 1 scores and positive values indicating that time 2 scores were higher compared with time 1 scores. This score change was calculated for three different performance domains, resulting in three outcome variables. The MSF questionnaire INCEPT covers these three performance domains and contains 18 specific items and three global

rating items about physicians' professional performance. The three performance domains are "professional attitude" (PA), "organization and (self)management" (OSM), and "patient-centeredness" (PC). Representative items of the PA, OSM, and PC domains are, for example: "Shows respect to other health care professionals," "Maintains quality medical records," and "Shows compassion to patients," respectively (see Supplemental Digital Content 1, <http://links.lww.com/JCEHP/A114> for a complete overview of item-clustering). All 18 items and the global rating items were rated on a 5-point Likert scale (1 = totally disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = totally agree) with an additional "I cannot judge this statement" option. To obtain domain-specific score changes, we subtracted average PA, OSM, and PC scores obtained at time 1 from time 2 scores. The domain scores were calculated per assessor group and aggregated per assessor group to obtain the mean performance score in each domain. Results from our previous research indicated that the clustering of the items differed per assessor group.³⁴ We thus calculated domain-specific average scores, according to the clustering of the specific type of assessor group. MSF scores were only aggregated for physicians who received sufficient evaluations to obtain reliable domain-specific scores for formative feedback use.

Explanatory Variables

Three explanatory variables were included in the model. These variables were the number of negative discrepancies, type of assessor group, and physicians' years of experience. First, we computed the total number of negative discrepancies between self-assessment scores and other-scores per physician, per assessor group, by determining how many of the 18 items a physician had overrated his or her performance. We calculated the discrepancy score by subtracting the physician's self-assessment scores with the assessors' scores (per assessor group) for each of the 18 items. When overrating occurred on an item (self-assessment scores being higher than assessors' scores), a score of one was given, and by summing these scores, a total negative discrepancy score was created. We chose to calculate this total negative discrepancy score to capture how often physicians were confronted with a negative discrepancy in their feedback report, regardless of how large this discrepancy was. This score ranged from zero to 18, with zero indicating no negative discrepancy and 18 indicating that negative discrepancies occurred for all items. For example, if a physician overrated his/her performance on six items compared with the score received by residents, this physician received a six for the negative discrepancy score on the resident level. The second variable was the type of assessor group, which was operationalized as a nominal variable, with three different groups: peers, residents, and coworkers. Third, we operationalized physicians' experience (years certified as medical specialist) as an ordinal variable with five values ranging from 0 to 5 years, 6 to 10 years, 11 to 15 years, 16 to 20 years, and more than 21 years.

Covariates

A covariate that had to be adjusted for in the model is the score physicians received from assessors in the first MSF evaluation: the so-called prescore or "scores at time 1." Also, we included "the number of months between the first and second MSF evaluation." Additionally, we included "the percentage of missing values per performance domain" (the number of

assessors who opted for “I cannot judge this statement” per item divided by the number of assessors for that physician, aggregated to the performance domain). These missing values on items were not imputed but were incorporated as covariates “the percentage of item missingness” for the MSF evaluation during time 1 and time 2. Furthermore, as physicians’ gender was found to be associated with overrating their performance (male physicians tend to overrate more¹⁹), this variable was incorporated as a covariate as well.

Data Analyses

Descriptive statistics were calculated for the characteristics of the study population. Outliers were explored with Mahalanobis distance and removed if deemed suitable, normality and heterogeneity of the data were examined using standardized residuals.³⁸ Evaluations with more than 50% missing values on the 18 items were removed and not included in data analyses. The remaining evaluations with missing values were aggregated to use for analyses, with the percentage of missing values included as covariates. To quantify possible associations between the negative discrepancy score and performance score changes between time 1 and time 2, we used three, linear, mixed-effects, regression models estimated with maximum likelihood method and Satterthwaite method for *t* tests. The linear mixed models with random effects allowed for the adjustment of hierarchical clustering of multiple evaluations within physicians. First, we modeled how much variance was associated with the differences between physicians on the primary outcome variables to determine the intraclass correlation, a practical value to establish whether multilevel modeling is required or not.³⁹ We investigated whether and how physicians’ performance score changes as rated by their assessors would be associated with negative discrepancies by adding the negative discrepancy score variable to the model. Next, we added the type of assessor group in interaction terms to the model to investigate whether the type of assessor group modified the associations between negative discrepancies and performance score changes. Finally, we used random-slope mixed models to investigate variation in how physicians “deal” with negative discrepancies (namely, the associations of negative discrepan-

cies with assessors’ score changes). If the random-slope models showed better fit than the random-intercept model (indicating that the associations between negative discrepancies and score change differed by physician), a cross-level interaction effect with physicians’ years of experience was added. This cross-level interaction was added to investigate whether physicians’ experience could explain these random slopes. To interpret the regression coefficients and to avoid multicollinearity between explanatory variables, we centered the continuous explanatory variables to the grand means.³⁸ We applied a Bonferroni correction for multiple testing. We used R studio version 3.5.1 with packages “lme4,” “lmerTest,” “ggplot2,” and “psych” for data analyses.⁴⁰

RESULTS

Study Participants

One hundred and three physicians from 42 departments in nine hospitals participated twice in an MSF procedure, including self-assessments. For these physicians, 3182 evaluations were filled out by assessors (excluding 88 evaluations with more than 50% missing items): 1522 at time 1 and 1660 at time 2. Physicians had an average total self-score of 4.16 (SD = 0.36) at time 1, and an average total self-score of 4.18 (SD = 0.39) at time 2. Per assessor type, physicians on average overrated themselves on 6.19 (SD = 4.27), 6.55 (SD = 4.47), and 6.15 (SD = 4.77) items compared with residents, peers, and coworkers. On average, each physician received 15 evaluations at time 1 and 16 evaluations at time 2. The response rates per assessor group at time 1 and time 2 MSF were 86% and 81% for residents, 83% and 86% for peers, and 84% and 83% for coworkers, respectively. From the total evaluation data, 9.4% was missing. Sixty-six percent of the evaluated physicians were male, mostly from the age category of 36 to 40 years, with 1 to 10 years of experience on average. Forty-nine percent of the physicians had improved their total MSF score between time 1 and time 2, according to all assessor groups. Table 1 summarizes physicians’ and assessors’ characteristics, and Table 2 summarizes the average scores that physicians received from their assessors.

TABLE 1.
Descriptive Statistics of the Evaluated Physicians and Their Assessors

	Evaluated Physicians	Assessors Who Evaluated		
		Residents	Peers	Coworkers
<i>N</i> (<i>N</i> evaluations)	103 (3182)	242	684	999
<i>N</i> male, % male	68, 66%	105, 43.4%	418, 61.1%	282, 28.2%
% Participants of age category				
<25 y	0%	0.4%	0.3%	1.4%
25–35 y	9.7%	72.7%	4.4%	18.7%
36–40 y	21.4%	12.8%	21.3%	11.3%
41–45 y	19.4%	0.8%	20%	11.2%
46–50 y	13.6%	2.1%	13.8%	18%
51–55 y	16.5%	1.7%	12.6%	14.8%
56–60 y	15.5%	0%	9.1%	10.8%
61–80 y	2.9%	0.4%	5.1%	4.8%
missing	1%	9.1%	13.3%	8.9%

(Continued)

TABLE 1.
Descriptive Statistics of the Evaluated Physicians and Their Assessors (Continued)

	Evaluated Physicians	Assessors Who Evaluated		
		Residents	Peers	Coworkers
Physicians' years of experience				
0–5 y	20.4%	NA*	NA	NA
6–10 y	20.4%	NA	NA	NA
11–15 y	9.7%	NA	NA	NA
16–20 y	18.4%	NA	NA	NA
21–45 y	9.7%	NA	NA	NA
missing	21.4%	NA	NA	NA
Mode years of employment	0–10 y	na	na	na
No. of hospitals	9	4	9	9
No. of departments	42	9	42	42
% Participants from				
Academic hospital	32%	28.8%	30.2%	26.7%
Top clinical Hospital†	8.7%	7.9%	7.9%	8.5%
General hospital	44.7%	56%	51.6%	50.1%
Other type of hospital	14.6%	7.3%	10.3%	14.7%
Nonsurgical specialty	69.9%	85.5%	77.8%	72.8%
Surgical specialty	30.1%	14.5%	22.2%	27.2%

*NA indicates not available.

†Top clinical hospitals provide basic as well as complex health care procedures yet is not an academic medical center.

TABLE 2.
Descriptive Statistics of the Multisource Feedback Scores Given by 242 Residents, 684 Peers, and 999 Coworkers to 103 Physician During 2012–2018 for 2 MSF Evaluations

	Scores Given by . . .		
	Residents	Peers	Coworkers
Average score given to all physicians (SD):			
Total score			
At time 1	4.35 (0.24)	4.40 (0.27)	4.41 (0.26)
At time 2	4.34 (0.28)	4.36 (0.28)	4.41 (0.24)
PA			
At time 1	4.34 (0.31)	4.40 (0.32)	4.38 (0.32)
At time 2	4.34 (0.28)	4.35 (0.32)	4.36 (0.30)
Organization and (self)management			
At time 1	4.32 (0.26)	4.32 (0.30)	4.28 (0.33)
At time 2	4.30 (0.24)	4.29 (0.32)	4.32 (0.31)
Patient centeredness			
At time 1	4.43 (0.32)	4.47 (0.26)	4.55 (0.22)
At time 2	4.42 (0.33)	4.45 (0.28)	4.53 (0.23)
Average score change* (SD) and % of improvement			
Total score			
Score change of all physicians	−0.01 (0.22)	−0.04 (0.24)	−0.01 (0.26)
% of physicians improved	53%	46%	47%
PA			
Score change	−0.01 (0.25)	−0.05 (0.25)	−0.03 (0.24)
% of physicians improved	50%	44%	48%
Organization and (self)management			
Score change	−0.03 (0.24)	−0.02 (0.28)	0.03 (0.30)
% of physicians improved	47%	50%	58%
Patient centeredness			
Score change	0.00 (0.30)	−0.02 (0.28)	−0.01 (0.25)
% of physicians improved	52%	47%	47%

*A positive value indicates a positive score change; hence improvement in time 2 scores compared with time 1 scores. A negative value thus indicates a negative score change; a decrease in time 2 scores compared with time 1 scores.

Significant Associations Between Self–Other Negative Discrepancies and Score Changes

Intraclass correlations for the outcome variable “score change” in the three performance domains PA, OSM, and PC were 0.21, 0.14, and 0.20, respectively. Hence, approximately 14 to 21% of the variability in score changes within the 3 domains was associated with differences between physicians. We, therefore, proceeded the analyses with mixed-effects models. The varying-intercept models revealed that for two performance domains (OSM and PC), negative discrepancies had a significant negative association with assessors’ score changes, and the varying-slope model revealed a significant random slope for the PA domain. Testing the random intercept with random slope models to verify whether significant variation between physicians’ slopes of negative discrepancies exists yielded no better fit for the OSM and PC performance domains (OSM: $\Delta\chi^2_{\text{OSM}} = 7.79$; $\Delta\text{df} = 4$; $P = 0.10$ and PC: $\Delta\chi^2_{\text{PC}} = 3.85$; $\Delta\text{df} = 4$; $P = 0.43$). The number of negative discrepancies was negatively associated with score change between time 1 and time 2 for OSM and PC (OSM: $b_{\text{OSM}} = -0.02$; 95% CI, -0.03 to -0.02 ; $\text{SE} = 0.004$; PC: $b_{\text{PC}} = -0.03$; 95% CI, -0.03 to -0.02 ; $\text{SE} = 0.004$). No significant main or interaction effect was found for the type of assessor for any of the three performance domains. The final model of the OSM and PC domains concludes that when physicians were not confronted with negative discrepancies, they showed an improvement in time 2 scores. In contrast, physicians who were confronted with 18 negative discrepancies showed a negative score change, that is, a decrease in assessors’ scores at time 2; hence, they did not improve their score. For an example of these results, refer Supplemental Digital Content 1 (see Figure 2, <http://links.lww.com/JCEHP/A114>). Due to the nonsignificant random slopes of OSM and PC, no cross-level interaction effects were tested with physicians’ years of experience for those performance domains. For PA score changes, a better fit of the random slopes model was observed ($\Delta\chi^2_{\text{PA}} = 25.31$, $\Delta\text{df} = 4$, $P < 0.001$) and testing the cross-level interaction of physicians’ years of experience with negative discrepancies yielded significant associations. Hence, the years of experience explained the negative slopes of physicians: physicians with 6 to 10 and 16 to 20 years of

experience have a negative association of negative discrepancies with score changes ($b_{6-10 \text{ years' experience}} = -0.03$, 95% CI $[-0.05$ to $-0.003]$; $\text{SE} = 0.01$; $b_{16-20 \text{ years' experience}} = -0.03$, 95% CI $[-0.06$ to $-0.004]$, $\text{SE} = 0.01$). Hence, experienced physicians who were confronted with more negative discrepancies improved less or even failed to improve according to all assessor groups compared with less-experienced physicians. Supplemental Digital Content 1 (see Figure 3, <http://links.lww.com/JCEHP/A114>) shows a visual representation of these results.

Educational Importance of Findings

The associations of negative discrepancies with score changes were substantial, as the standardized regressions showed beta’s of -0.15 , -0.11 , and -0.11 for PA, OSM and PC, respectively. The final models explained 48%, 40%, and 41% of the variance found in the differences in scores for PA, OSM, and PC, respectively, whereas negative discrepancies explained 19%, 13%, and 14% of the variance after adjustment of covariates. The final models showed a significantly better fit than the intercept-only models (PA: $\Delta\chi^2_{\text{PA}} = 122.38$; $\Delta\text{df} = 16$; $P < .001$; OSM: $\Delta\chi^2_{\text{OSM}} = 103.79$; $\Delta\text{df} = 6$; $P < .001$ and PC: $\Delta\chi^2_{\text{PC}} = 116.91$; $\Delta\text{df} = 6$; $P < .001$). Tables 3–5 display the unstandardized regression coefficients, standardized regression coefficients, random slope variance, and random intercepts variances of the final models.

DISCUSSION

Given the importance of MSF for the evaluation and improvement of physicians’ performance, this study was set up to scrutinize a key component in MSF: negative discrepancies in self-assessment and assessors’ scores and their association with physicians’ subsequent score changes. Because there was little insight in how these discrepancies would influence physicians’ subsequent performance, we examined if physicians who were confronted with negative discrepancies would receive more positive or negative MSF scores at their second MSF evaluation. In this study, 49% of the physicians improved their total MSF score between time 1 and time 2. This result is similar to data

TABLE 3.
Unstandardized Regression Coefficients, Standardized Regression Coefficients, and Random Intercepts Variances of the Associations Between Negative Discrepancies With Score Changes in the “Organization and (self)management” Domain

	Score Changes in Organization and (self)management		
	Unstandardized Regression Coefficients (SE)	95% CI of Unstandardized Regression Coefficients	Standardized Regression Coefficients
Intercept	.17 (.04)*	.10 to .25	-.001
Random effect of intercept (SD)	.02 (.14)	NA	NA
Negative discrepancy score (0–18)	-.02 (.004)	-.03 to -.02	-.11
Physicians’ scores at time 1 (1–5)†	-.55 (.05)	-.65 to -.44	-.17
Covariates			
Percentage missingness on items time 1	-.01 (.01)	-.04 to .01	-.02
Percentage missingness on items time 2	.007 (.02)	-.04 to .05	.003
Months between time 1 and time 2 evaluation	.004 (.004)	0.001 to .01	.04
Physicians’ gender (0 = male, 1 = female)	-.05 (.04)	-.13 to .03	-.02

*Bold text indicate significant values at $P < .001$.

†All variables (except the negative discrepancy score, physicians’ years of experience, and physicians’ gender) have been centered to the grand mean to avoid multicollinearity and to help interpret the coefficients by giving the variables a meaningful zero.

NA indicates not applicable.

TABLE 4.

Unstandardized Regression Coefficients, Standardized Regression Coefficients, and Random Intercepts Variances of the Associations Between Negative Discrepancies With Score Changes in the “Patient-Centeredness” Domain

	Score Changes in Patient Centeredness		
	Unstandardized Regression Coefficients (SE)	95% CI of Unstandardized Regression Coefficients	Standardized Regression Coefficients
Intercept	.14 (.03)*	.08 to .20	-.01
Random effect of intercept (SD)	.01 (.11)	NA	NA
Negative discrepancy score (0–18)	-.03 (.003)	-.03 to -.02	-.11
Physicians' scores at time 1 (1–5)†	-.59 (.05)	-.71 to -.49	-.15
Covariates			
Percentage missingness on items time 1	-.01 (.01)	-.04 to .01	-.02
Percentage missingness on items time 2	-.02 (.02)	-.06 to .02	-.02
Months between time 1 and time 2 evaluation	.003 (.002)	-0.001 to .006	.03
Physicians' gender (0 = male, 1 = female)	-.003 (.03)	-.07 to .07	.002

*Bold text indicate significant values at $P < .001$.

†All variables (except the negative discrepancy score, physicians' years of experience, and physicians' gender) have been centered to the grand mean to avoid multicollinearity and to help interpret the coefficients by giving the variables a meaningful zero.

NA indicates not applicable.

from other research on physicians' self-reported performance improvement after receiving MSF.^{15–17,19,41} Whether physicians improved their subsequent scores seems to be influenced by the number of negative discrepancies that physicians were con-

fronted with when receiving their feedback report. The extent of performance improvement declined when physicians are confronted with more negative discrepancies, as showed by the significant negative associations. Previous research has suggested

TABLE 5.

Unstandardized Regression Coefficients, Standardized Regression Coefficients, and Random Intercepts Variances of the Associations Between Negative Discrepancies With Score Changes in the “Professional Attitude” Domain

	Score Changes in PA		
	Unstandardized Regression Coefficients (SE)	95% CI of Unstandardized Regression Coefficients	Standardized Regression Coefficients
Intercept	.11 (.05)*	.12 to .24	.02
Random effect of intercept (SD)	.005 (.07)	NA	NA
Random effect of slope “negative discrepancy score” (SD)	.0005 (.02)	NA	NA
Negative discrepancy score (0–18) for physicians with			
0–5 y	-.01 (.01)	-.03 to .01	-.05
6–10 y	-.03 (.01)	-.05 to -.01	-.13
11–15 y	-.02 (.02)	-.05 to .01	-.08
16–20 y	-.03 (.01)	-.06 to -.01	-.14
>21 y	-.03 (.02)	-.06 to .01	-.15
Physicians' years of experience			
0–5 y (reference group)	NA	NA	NA
6–10 y	.08 (.07)	-.06 to .23	-.09
11–15 y	-.01 (.09)	-.19 to .16	-.13
16–20 y	.08 (.08)	-.07 to .23	-.12
>21 y	.15 (.11)	-.06 to .35	-.05
Physicians' scores at time 1 (1–5)†	-.54 (.05)	-.64 to -.44	-.17
Covariates			
Percentage missingness on items time 1	-.01 (.01)	-.05 to .02	-.02
Percentage missingness on items time 2	-.01 (.03)	-.04 to .05	.003
Months between time 1 and time 2 evaluation	.002 (.002)	-.001 to .01	.03
Physicians' gender (0 = male, 1 = female)	-.03 (.04)	-.13 to .03	-.02

*Bold text indicate significant values at $P < .03$.

†All variables (except the negative discrepancy score, physicians' years of experience, and physicians' gender) have been centered to the grand mean to avoid multicollinearity and to help interpret the coefficients by giving the variables a meaningful zero.

MSF indicates multisource feedback; NA, not applicable.

that the extent to which feedback is deemed valuable depends on the degree to which feedback can be reconciled with one's self-assessment.^{21,26} Our research findings may point to the limit of reconciliation of feedback with self-assessment because performance seems to decline when more than half of the feedback items show negative discrepancies. Although the unstandardized regressions coefficients showed small associations, it must be kept in mind that the range of "score changes" is fairly small, and the relative importance of negative discrepancies upon "score changes" was substantial. Possible explanations of why negative discrepancies diminish the extent of performance improvement range from the feedback recipients' emotional reactions to cognitive factors.²⁶ Physicians who overrate their performance are uninformed of their current competency and might be unaware of the standards of high performance. These physicians are perhaps less likely to achieve better performance because they simply do not know how and are reluctant to ask for additional feedback due to fear of not appearing knowledgeable.²⁹ Furthermore, physicians' emotional responses after being confronted with negative discrepancies might also take up essential cognitive resources to adequately deal with this type of feedback.³³ Especially, feedback that focuses on personal performance, such as MSF, has the potential to trigger overwhelming emotions. Uptake and use of feedback are challenging if it threatens the recipients' self-esteem or self-image, and if it elicits strong, negative emotions.²⁸ However, our results hint at the fact that physicians' confidence might be the underlying factor in not accepting incongruent feedback. Physicians with an average total prescore of 4.2, who were confronted with more than nine negative discrepancies, showed an average performance score decline of 0.11 in the next MSF evaluation. These physicians rated themselves quite high, as an average total score of 4.2 would mean that these physicians gave themselves a score of five on multiple items, implying that they are fairly confident of their performance. Being overly confident has been found to distort acceptance of feedback, perceiving feedback as less credible and thus cause denial of feedback.²⁶ Comparable results of the negative effects of self-overrating on subsequent MSF scores have been found in MSF research conducted in personnel psychology and medical education. Personnel managers and clinical teachers who had severely overrated their performance showed less or eventually no improvement in the subsequent scores given by assessors.^{20,42-45} Further support for this reluctance to change due to physicians' confidence stems from the finding that score changes in the PA domain were not influenced by the number of negative discrepancies for physicians with less than six years of experience. Only physicians with 6 to 10 and 16 to 20 years of experience showed a significant negative association with score changes at time 2. Because confidence is directly linked to experience²⁶ (the more experience, the more confident), this might indicate that too much confidence results in disregarding incongruent feedback. To find out more about the influence of physicians' confidence level and acceptance of incongruent feedback, an interesting take would be to focus on the magnitude of discrepancies as well, rather than solely the number of discrepancies. With the magnitude of discrepancies, it could be argued that the higher the magnitude, the more overconfident the physician would be. Other measures of physicians' confidence level and other assessment scores of physicians should be taken into

account as well to gauge whether confident physicians are reluctant to change or whether they are unable to change. Yet to investigate this matter, future research is needed that takes a mixed-methods approach. Previous research indicated that the type of feedback provider influences the perceived credibility of feedback and thus the acceptance and use of feedback.^{27,30,31} In this study, we did not find significant differences among the different assessor groups in physicians' subsequent scores, neither between the associations of negative discrepancies with score changes. The more often physicians overrated their performance, the less improvement in scores was observed, according to every assessor group in every performance domain. This could mean that for these physicians, none of the assessor groups were credible enough to accept and use the feedback for performance improvement. However, the average number of negative discrepancies (6) was similar in all three assessor groups. Hence, this lack of variation could also explain why no significant assessor differences were found between the associations of negative discrepancies with score changes. These results need to be clarified in further research to investigate whether accepting negative discrepancies depends on other contextual factors. The results unfolded in this study ask for future research directed at a deeper understanding of why too many negative discrepancies cause performance decline and how to address others' feedback more effectively. This future research should include qualitative approaches to understand why specific responses are made when physicians are confronted with negative discrepancies, for example, by conducting semistructured interviews with evaluated physicians. Moreover, the content and specificity of the narrative comments that are part of MSF should be investigated and could reveal more insight into the type of feedback, the feedback provider, and the feedback recipient.⁴⁶ Difficult questions regarding the effectiveness of MSF require both quantitative and qualitative research methods.

LIMITATIONS

There are some limitations to the present study. A relatively small sample of 103 physicians was included in this study. These physicians were evaluated before the mandating of participation in MSF, from 2012 to 2018. Participation in MSF assessment has only recently become mandatory for Dutch medical specialists (January 2020), which might have been the reason for the relatively small sample. Besides this relatively small sample size, we assumed that changes in scores given by residents, peers, and coworkers indicated physicians' performance change. Although the validity of the measurements is supported with evidence from the literature and empirical analyses,³⁴ we did not ask assessors whether they noticed changes in the physicians' performance, nor did we compare their scores to other performance measurements. Combining several measurements, such as perceived performance improvement and external evaluation data, yields more insight into performance.^{47,48} Also, we cannot state with certainty that the MSF process or the negative self-other discrepancies caused the performance changes, as we could not include a control group in this study. This observational retrospective study merely investigated associations without a controlled postperiod. Furthermore, research has

demonstrated that MSF does not self-evidently result in performance change, but the facilitative interview following MSF does.⁴⁹ Unfortunately, the period after MSF collection has not been monitored, and hence, it was not taken into consideration how physicians discussed their feedback afterwards. Finally, the inherent limits of using a short Likert-type scale for the evaluation of practicing physicians should be mentioned. Consistent with other MSF research, most assessors gave high scores resulting in highly skewed favorable impressions of physician performance.^{50,51} These high scores imply that a large part of the physicians scored well above 4.0, and for them, the 5-point scale simply allows very little positive change. Indeed, we found a significant negative association between time 1 scores and subsequent score changes. Nevertheless, these physicians still have high scores at time 2. The difficulty of detecting score change when the performance distributions are skewed is an issue known to MSF,⁴⁷ and this issue was present in this study as well.

IMPLICATIONS

The results of this study imply that when physicians receive MSF, confrontation with too many negative discrepancies might be detrimental for subsequent performance scores. Performance decline seemed to be present when more than half of the feedback report's scores showed negative discrepancies. Thus, for physicians with lower assessor scores than expected from self-assessment, achieving performance improvement will be more challenging, and newer (follow-up) approaches need to be considered or even designed. Depending on the explanations of the lack of improvement in self-overrating physicians, different approaches may be needed.^{6,42} It seems that the follow-up should focus upon physicians' acceptance of feedback and especially on the acceptance of feedback that shows a multitude of negative discrepancies between physicians' self and assessors' scores. Helpful interventions may include raising awareness of physicians on why these negative discrepancies have occurred, assisting physicians to focus their attention on the actual feedback instead of meticulously focusing on negative discrepancies and providing facilitated follow-up on feedback uniquely tailored to (overly) confident physicians.

CONCLUSION

MSF is a popular method in the evaluation of practicing physicians' professional performance. However, there appears to be a trade-off in MSF: at a certain point, the discrepancies in given feedback may become too much for recipients to translate into performance improvement. It is essential to conduct in-depth research into the reasoning processes and confidence of recipients to reach MSF's full potential. In the end, receiving feedback is not an emotionally neutral task, and its implications are like a double-edged sword: it may help as well as hinder the improvement of physicians' performance. The goal of using MSF for the improvement of physicians' professional performance can perhaps be reached by discussing attempts to reconcile physicians' dissonances with the feedback and provide stimulating guidance for improvement.

Lessons for Practice

- The extent of physicians' performance improvement, as rated by their assessors, is likely to decline when physicians are confronted with negative discrepancies between self-assessment scores and their assessors' scores.
- When physicians are confronted with negative discrepancies on more than half of the total feedback items, their performance scores are more likely to deteriorate in the subsequent MSF evaluation, compared with the previous evaluation.
- Physicians' confidence might explain why physicians who overrate their performance do not improve their performance, and this confidence should be taken into account during the facilitative interview after MSF.

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