Bill & Melinda Gates AI Equity Initiative

Katherine Picho-Kiroga, PhD

April 2024

Prepared by Katherine Picho for Amplify: Gates AI Equity Initiative

Executive Summary: Stereotype Threat and Feedback

Feedback is essential to the learning process; positive feedback reinforces learning by confirming one currently understands, and negative feedback highlights areas that are yet to be mastered and improved upon. Ideally, both types of feedback should foster learning and optimize performance. However, both positive and negative feedback do not always positively influence learning among members of marginalized groups, especially when under stereotype threat. This is because members of stigmatized groups tend to rely more on performance feedback and to perceive it through the lens of salient group stereotypes, particularly when they are uncertain about their ability and efficacy in the stereotyped domain (Rydell & Boucher, 2017). Therefore, members of marginalized groups exist in a state of attributional ambiguity regarding the causes of feedback they might receive from evaluators belonging to dominant social groups; this does sometimes lead individuals from these groups to discount feedback-- both positive and negative (Crocker et al., 1991), consequently hampering their ability to profit from it. Positive feedback tends to be discounted when individuals believe that it was motivated by their marginalized status. That is, that the evaluator gave positive feedback to avoid being perceived as biased. Negative feedback on the other hand, is sometimes rejected because it is perceived as being rooted in discrimination (Major, Quinton & Schmader, 2003). Rejecting negative feedback curtails opportunities to improve, hence interfering with learning and subsequently, performance.

Stereotype Threat and Feedback.

Stereotype threat shapes when feedback is obtained, how it is construed and applied to learning and the application of new knowledge. Only a handful of studies have examined the effect of feedback on learning outcomes of stereotype threatened individuals. Findings from these studies link positive feedback to increased motivation, attention, and persistence on tasks, which subsequently lead to improvements in learning (and performance), and enhanced interest and engagement in the domain (Rydell & Boucher, 2017). Negative feedback has the reverse effect, however (Rydell, Rydell et al., 2010). In fact, negative performance feedback is weighted more heavily among marginalized group members (more than positive feedback, and relative to non-marginalized groups) with much greater effects on learning (Rydell & Boucher, 2017). Neuro-scientific research explains why negative feedback hurts rather than helps learning and performance outcomes of stereotype threatened individuals.

The Neuroscience behind effects of feedback on the stereotype threatened.

Studies show that stereotype threat elicits neural-attentional bias toward negative feedback, which impairs working memory and subsequently, performance. More specifically,

stereotype threat enhances basic perceptual processing of only wrong feedback very early on in the information processing stream (Forbes & Leitner, 2014), making those susceptible to the phenomenon apt at attending more to negative (than positive) feedback provided during task completion. Further, attentional bias towards negative feedback leads to more extensive encoding of this feedback (in memory), biasing one's memories of past performance toward negative feedback, so that in future stereotype threatening situations, stereotype-confirming experiences may be more salient (Forbes & Leitner, 2015). Forbes & Leitner (2015), for example, found that women exposed to threat encoded error feedback better than correct feedback—a tendency not seen with men in general, or among women in stereotype neutral conditions.

Effective Feedback Strategies.

Given the centrality of feedback to learning, and empirical evidence to support that both positive and negative feedback do not always achieve their intended purpose among students from social groups who could most benefit from it, educators face the dilemma of providing critical feedback to stereotype threat susceptible students in ways that nullify the discounting of feedback, and other deleterious effects related to negative feedback.

Recommendation. Based on the review of the literature below, an integrated model of feedback that incorporates (a) wise feedback (b) promoting a growth mindset, and (c) mastery achievement goals is proposed.

1. Wise Feedback.

Coined by Claude Steele (1992; 1997), strategies to assist minority students are wise if they ensure that the students will not be judged stereotypically, and that their abilities and belonging (in a given domain) are assumed rather than doubted. WISE feedback is a mode of critical feedback delivery rooted in the foregoing definition. It entails: (1) communicating high expectations, while at the same time (2) providing assurance that the recipient can meet those expectations. The limited research in this area demonstrates that wise feedback: diminishes students' perception of bias, and improves student motivation, learning and performance (Cohen et al., 1999; Yeager et al., 2014).

Cohen et al (1999) compared Black/White student responses to three forms of critical feedback: Wise feedback, unbuffered criticism or critical feedback that included positive praise. Study results revealed that (1) Black students responded unfavorably to unbuffered criticism, and (2) wise feedback improved motivation and reduced perceptions of race bias among Black students. These results were replicated in a second experiment, as well as in subsequent studies by Yeager and colleagues (2014).

2. Growth Mindset.
Decades of research show that students who conceive of intelligence as a fixed trait (entity view) rather than as a potential that can be developed (incremental view), are at greater risk of negative academic achievement outcomes (Dweck & Sorich, 1999). Studies have also shown that stereotype threat effects are attenuated by incremental views of intelligence. A few interventions to that effect have been able to demonstrate that stereotype threat effects can be counteracted by training at-risk students to espouse incremental views of intelligence (Aronson et al., 2002; Good et. al., 2003).

Of interest to this review, one such study paired 7th grade students from a rural school in Texas paired with mentors (college students), who mentored them over the course of one academic year (Good et al., 2003). Mentorship was both face to face, and virtual (communication via email). Mentors taught students about the expandable nature of intelligence (incremental condition) vs. the dangers of drugs (control group); mentors also communicated to students that the tendency to experience initial difficulty in 7th grade was due to external reasons outside the self (attribution condition), or a combination of incremental and attribution (attribution + incremental condition). Results from this study revealed that training students to make nonpejorative explanations for their academic challenges by either espousing a growth mindset (incremental view of intelligence), or attributing challenges to the novelty of the situation meaningfully increased student achievement. Gender gaps in performance disappeared in the foregoing conditions but persisted in the anti-drug (control) condition.

3. Promoting Mastery Learning Goals.
Broadly speaking, individuals tend to approach achievement with a motivation to demonstrate (performance) or to develop (mastery) competence. Individuals oriented towards performance goals focus on evaluation, while the primary focus for the mastery oriented is to develop competence and learn new skills (Dweck, 1986; E. Elliot & Dweck, 1988). Accordingly, these goal orientations have differential effects on how individuals react to performance failure and poor evaluations: Mastery goals offer less discouragement, and facilitate better performance after initial failure (e.g., poor performance), than do performance goals (Grant & Dweck, 2003). This is because mastery rather than performance reframes the failure as a challenge (to improve) rather than a threat (Stout & Dasgupta, 2013). Individuals from socially devalued groups tend to adopt performance orientation goals under stereotype threat (Picho & Grimm, 2023), which impairs performance outcomes (Brodish & Devine, 2009; Chalabev et al., 2008). Mastery goals have been shown to have the reverse effects.
Hardly any studies have investigated feedback related to mastery goals but the substantive literature on the positive impact of mastery goal orientation on learning suggests that adopting this approach to providing feedback could positively affect academic outcomes of students in general, and those from marginalized groups in particular. Souchal et al (2014) found

that delivering assessments with mastery but not performance goal structures narrowed the gender gap in math assessments. Smeding et al (2013) found similar results with respect to the socio-economic status (SES) achievement performance gaps among university students. Smeding et al (2013) fashioned assessments and related feedback after mastery and performance goals. Over the course of one semester students completed assessments that, separately, promoted either mastery or performance evaluation goals. Mastery oriented assessments were presented to students as primarily focused on improving learning quality, helping students in the learning process through regular work (assignments) and increasing their knowledge (Smeding et al, 2013; Souchal et al., 2014). These assessments were continuous (multiple over the course of the semester); At the end of each lecture students received a list of learning goals. At the beginning of the next class session, students completed an assessment, which tested (content) mastery learning goals that had been shared in the previous session. Performance oriented assessments were assessed at the end of the semester (final exam)- traditional norm-based tests.

Researchers found that the SES achievement/ performance gap disappeared in the mastery assessments, but remained consistent in the traditional, performance-based assessments. These results were replicated in two additional field experiments. This study focused on the impact of mastery-oriented assessments, but the impact of mastery-oriented feedback was implicit; it follows that mastery-oriented assessments are followed by corresponding feedback, which in all three experiments, took the form of discussing student performance on the assessment relative to previously set learning goals. These findings demonstrate that such feedback encourages students to focus on developing competence, which could benefit students from socially devalued groups for whom a focus on performance might serve to trigger self-evaluations of performance in reference to extant negative social stereotypes pertinent to their groups.
Thus, like growth mindset, mastery orientation can pivot one's construal of critical feedback to emphasize factors that can be improved upon (intelligence is malleable, competence can be developed) rather than immutable traits (intelligence is fixed) or factors like gender race, where negative-ability stereotypes related to performance abound.

Tips for Incorporating Mastery Learning Goals in Feedback

Provide feedback that...

1. Is specific and substantive rather than one that is comparative/ fosters competition
2. Encourages perseverance, focuses on development of competence on the relevant topic and/ or domain
3. Acknowledges (praises) effort, and improvement
4. Emphasizes achieving a standard relative to mastery of content and prior performance, rather than focusing on relative performance (comparison to others)

Bibliography

I. **The Mentor's dilemma- Study 1.** Cohen, Steele & Ross. (1999).
a. Sample: 44 Black and 47 White undergraduate students
b. Feedback Manipulation: The feedback was identical across all conditions, except for **additional information provided in the other conditions as follows:**

1. Critical feedback – unfiltered critical feedback on performance [the same across all conditions], ***without*** additional comments or supports (i.e., high standards + assurance)

2. Wise feedback – critical feedback prefaced with **explicit communication of high standards** and **assurance that the student could meet these standards,** below:

Preface to critical feedback: *It's obvious to me that you've taken your task seriously and I'm going to do likewise by giving you some straightforward, honest feedback.* The letter itself is okay as far as it goes—you've followed the instructions, listed your teacher's merits, given evidence in support of them, and importantly, produced an articulate letter. On the other hand, *judged by a higher standard, the one that really counts, that is, whether your letter will be publishable in our journal,* I have serious reservations. The comments I provide in the following pages are quite critical, but I hope helpful. *Remember, I wouldn't go to the trouble of giving you this feedback if I didn't think, based on what I've read in your letter, that you are capable of meeting the higher standard I mentioned*

3. Critical feedback + praise – Critical feedback in addition to general praise for performance.

Preface: Overall, nice job. Your enthusiasm for your teacher really shows through, and it's clear that you must have valued her [him] a great deal. You have some interesting ideas in your letter and make some good points. In the pages that follow, I've provided some more specific feedback
and suggested several areas that could be improved.

c. Outcomes. Student perception of bias (of the reviewer), and motivation.
d. Experiment: Participants were asked to write a recommendation letter for their favorite teacher, which, they were told, would be published in an educational journal. After completing this task, their motivation on the letter writing task was assessed using a 3-item questionnaire: *How much do you think you could improve your letter given the opportunity to revise? How much interest do you have in revising the letter before submitting it for publication? How important is it to you to do a good job on your recommendation letter?* Student photographs were taken [to accompany the letter, should it be accepted for publication in the journal]. One week later, they returned to receive one of three forms of feedback on the letters they had written. Assignment to experimental condition was randomized. Students were handed a sealed envelope containing the original letter they had written and feedback from an alleged reviewer. After reviewing feedback on their work, students were then asked to rate their perceptions of bias shown towards them by the reviewer; they also completed the same

motivation questionnaire completed at baseline (prior to the study).

E. Results.

- Criticism only condition: Black students who received unbuffered criticism rated the reviewer as more biased than did white students who received the same criticism.
- Wise feedback condition: Black students rated reviewers lower on bias than did White students.
- Criticism + praise condition: Perceptions of bias were mid-way between criticism only and WISE feedback.

Overall:

- ***Impact on perceived bias.*** Black students in the criticism only conditions rated the reviewer as biased significantly more than their counterparts in the wise feedback and criticism + praise conditions.
  - o Racial differences in perceived bias in feedback were greatest in the criticism only condition, smaller in the criticism + praise condition, and non-existent in the wise feedback condition.
- ***Impact on motivation to improve.*** Black students reported lower motivation than white students in the criticism only condition, but slightly higher motivation than White students when Wise feedback was provided.

In sum: Black students responded most favorably to Wise feedback, which increased motivation and reduced perceptions of race bias among Black students

II. **The Mentor's dilemma- Study 2.** Cohen, Steele & Ross. (1999).

Study 1 was replicated with modifications: The researchers sought to test the hypotheses that personal assurance is critical to wise feedback; specifically, that invoking high standards alone without personal assurance that those standards could be attained, doesn't sufficiently address the negative motivational consequences of the stereotype threat evoked by pointed criticism. To do this, the effect of feedback focusing on communicating high standards alone was isolated from feedback and tested as a standalone and compared with critical and wise feedback.

a. Sample: 80 Black and 73 White undergraduate students

b. Feedback Manipulation: The feedback was identical across all conditions, except for **additional information provided in the wise and critical + high standards only conditions:**

1. Critical feedback – unfiltered critical feedback on performance [the same across all conditions], ***without*** additional comments or supports (i.e., high standards + assurance)

2. Wise feedback – critical feedback prefaced with **explicit communication of high standards** and **assurance that the student could meet these standards,** below:

Preface to critical feedback [same as study 1]: *It's obvious to me that you've taken your task seriously and I'm going to do likewise by giving you some straightforward, honest feedback*. The letter itself is okay as far as it goes—you've followed the instructions, listed your teacher's merits, given evidence in support of them, and importantly, produced an articulate

letter. On the other hand, *judged by a higher standard, the one that really counts, that is, whether your letter will be publishable in our journal*, I have serious reservations. The comments I provide in the following pages are quite critical, but I hope helpful. ***Remember, I wouldn't go to the trouble of giving you this feedback if I didn't think, based on what I've read in your letter, that you are capable of meeting the higher standard I mentioned.***

3. Critical feedback + high standards only – Critical feedback in addition to high standards for performance. **Differences between this and wise feedback above are highlighted in yellow.**

Preface: *It's obvious to me that you've taken your task seriously and I'm going to do likewise by giving you some straightforward, honest feedback.* The letter itself is okay as far as it goes—you've followed the instructions, listed your teacher's merits, given evidence in support of them, and

importantly, produced an articulate letter. On the other hand, *judged by a higher standard, the one that really counts, that is, whether your letter will be publishable in our journal*, I have serious reservations. The comments I provide in the following pages are quite critical but I hope helpful. ***Remember, I wouldn't go to the trouble of giving you this feedback if I weren't committed to the quality of this journal—I want to uphold the highest standards for what I consider a suitable entry, for you or any student whose work is under consideration.***

c. Outcomes. Student perception of bias (of the reviewer), and motivation.

D. Experiment: Experimental procedures were identical to study 1.

E. Results.

- Criticism only condition: Black students who received unbuffered criticism rated the reviewer as more biased than did white students who received the same criticism.
- Black participants in the Wise and high standard only feedback conditions rated the reviewers as less biased than their counterparts in the critical feedback only condition; in these two conditions, their perceptions of bias were equivalent to that of their White peers.
- When negative feedback was accompanied by communication of high standards only, or wise feedback (high standards + personal assurance), Black students responded as favorably, if not more favorably than their White counterparts in the same conditions on ratings of perceived bias and motivation to improve on the task.
- ***Invoking high standards alone*** (in feedback) ***reduced perceptions of bias*** among Black students, but it was **not sufficient to increase their motivation to improve**, ***to the level*** of those who had received ***wise feedback*** (high standards + personal assurance).

III. Breaking the cycle of mistrust: WISE interventions and critical feedback. Study 1. Yeager et al (2014).

Yeager et al replicated the experiments by Cohen et al. in three **double-blind field experiments.** They examined the effects of feedback strategies to restore trust on minority adolescents' responses to critical feedback.

a. Sample. 44 7th grade students in 3 social studies classrooms from a mixed ethnicity suburban public middle school in the NE region of the U.S.

b. Feedback Manipulation. Two conditions were created.

1. **Critical feedback only** (control). Unlike Cohen et al (1999), the critical feedback given was not standardized across participants. Teachers were asked to provide rigorous, critical feedback (so the feedback varied based on student's essay).

2. **Wise feedback** (critical feedback + high standards+ personal assurance)- same operational definition as Cohen et al (1999).

c. Outcomes. School trust (student perceptions that the school was fair to them and to members of their racial group), and motivation (marked by whether students submitted revised essays after
the initial review).

D. Experiment. Students completed a baseline measure of school trust 4 times over the course of 6th grade (beginning, middle and end) and at the beginning of 7th grade. Sample items included: *"I am treated fairly by teachers and other adults at my school," "My teachers at my school have a fair and valid opinion of me," and "Students in my racial group are treated fairly by the teachers and other adults at [school name] Middle School".* 2.5 months after the experiment, school trust was assessed again.

In the spring when the study was conducted, they were asked to write an essay about a personal hero. Teachers were instructed to provide rigorous feedback to all student submissions. These were then given to the researchers, who randomly prefaced student feedback with either (a) no additional comments (control), or (b) wise feedback.

The Wise feedback, included in the critical feedback was as follows: *"I'm giving you these comments because I have very high expectations and I know that you can reach them."*

The control group note simply stated: *"I'm giving you these comments so that you'll have feedback on your paper."*

Students received feedback and had one week to revise their essays. At that time students either turned in a revised essay (or not). They also completed a questionnaire on school trust.

E. Results.

- **Wise feedback increased Black students' motivation**/ the likelihood of submitting a revised essay. 71% African American students who received WISE feedback revised essays vs. 17% in the control.
- The **effect** of wise feedback was **greater for African American students** compared to White students.
- Wise feedback was **particularly effective for African Americans with low school trust**; here, 82% of low-trust students who received wise feedback revised their essays compared to 0% (none) who received critical feedback only.
    - o These effects held up long-term and were consistent by the end of the school year.

IV. Breaking the cycle of mistrust: WISE interventions and critical feedback. Study 2. Yeager et al (2014).

a. Sample. New cohort of 44 7th grade students in from the same social studies teachers' classrooms in the same school as study 1.

b. Feedback Manipulation. ***Same as study 1.***

1. **Critical feedback only** (control). Teachers were asked to provide rigorous, critical feedback (so the feedback varied based on student's essay).

2. **Wise feedback** (critical feedback + high standards+ personal assurance)- same operational definition as Cohen et al (1999).

c. Outcomes. School trust (student perceptions that the school was fair to them and to members
of their racial group), and **quality of essays** (marked by whether students submitted revised essays after the initial review).

D. Experiment. Students completed a baseline measure of school trust twice in 6th grade, (beginning and end) and at the beginning of 7th grade, and after the intervention/ experiment 2.5 months later. Students were asked to write an essay about a personal hero. Teachers were instructed to provide rigorous feedback to all student submissions. These were then given to the researchers, who randomly prefaced student feedback with either (a) no additional comments (control), or (b) wise feedback.

The Wise feedback, included in the critical feedback was as follows: *"I'm giving you these comments because I have very high expectations and I know that you can reach them."*

The control group note simply stated: *"I'm giving you these comments so that you'll have feedback on your paper."*

Students received feedback and had one week to revise their essays. At that time students either turned in a revised essay (or not). They also completed a questionnaire on school trust.

Essay quality was assessed. Teachers were blinded to students' feedback conditions (i.e. wise/ control).

E. Results.

- Students who received wise feedback received significantly higher scores on their revised essays. This was particularly so for Black students. African American students who received critical feedback only performed worse than all other groups and across all experimental conditions.
- More African American students who received WISE feedback (88%) improved their essays compared to their counterparts in the critical feedback only condition (34%).
- Students who received wise feedback had better quality revised essays than those in the control (critical feedback only); they made more than twice as many corrections as their control counterparts.
- Wise criticism improved essay scores among students who had lower chronic levels of trust- significantly so for African American students

• Wise feedback severed the relationship between chronic mistrust and performance i.e., low-trust African American students wrote better quality essays after wise feedback compared to low-trust counterparts in the critical feedback only condition. Whereas there was no such effect among high trust African American students.

V. improving adolescents' standardized test performance: An intervention to reduce the effects of ST. Good et al (2003).

Researchers conducted a field experiment to test methods of helping female, minority, and low-income adolescents overcome the anxiety-inducing effects of stereotype threat and, consequently, improve their standardized test scores.

a. Sample. 138 7th grade students in a mixed ethnicity school in rural Texas.

b. Feedback manipulation: self-theories of intelligence vs. external attribution

7th grade students were randomly assigned to be mentored by college students who delivered messages on study strategies and other topics; as part of this, mentors encouraged proteges to either (a) **espouse incremental views of intelligence** (intelligence is malleable and can 'grow' or (b) to attribute academic difficulties to novelty of educational setting, which can be overcome.

c. Outcomes. Math and reading achievement scores

d. Experiment.

25 college student mentors from the University of Texas met with participants for a total of 180 minutes (90 minutes in the fall and 90 minutes in the spring). Students were randomized into one of 4 conditions: a control group, incremental group (intelligence is malleable), attribution group (academic challenges dues to environment) and a combination of incremental+ attribution. In addition to these two meetings, mentors kept in touch with their mentees during the school year via email where they continued to reinforce messages consistent with the aforementioned conditions + provide advice on effective study strategies. In collaboration with mentors, mentees designed web pages where they were able to advocate, in their own words, the experimental messages they were receiving from their mentors. This helped students internalize the messages received from their mentors.

e. Results.

• Gender gaps in math performance persisted in the control condition (message against drugs), but these gaps disappeared in the incremental, attribution and incremental + attribution intervention groups.

• Females in intervention groups outperformed their counterparts in the control group, and these performance differences were large.

• Students in intervention conditions outperformed their control counterparts in reading; students mentored in the malleability of intelligence performed better on reading than those in the anti-drug condition.

To conclude: encouraging students to make non-pejorative explanations for academic difficulties can meaningfully increase achievement.

VI. Reducing Socio-Economic Status Achievement Gap at a University by Promoting Mastery-Oriented Assessment. Smeding et al (2013).

Researchers conducted two field experiments and a randomized field experiment to assess whether a focus on learning and mastery-oriented goals would improve the performance of low SES students, and effectively narrow the SES achievement gap.

a. Sample:

Study 1: 246 first year students

Study 2: 97 first year students

b. Experimental Manipulation.

Students received assessments that corresponded either to a mastery-orientation and a final exam, which corresponded to performance-approach orientation.

c. Outcomes. Academic performance

d. Methods.

At the beginning of the semester students were told that they would engage in assignments designed to improve the quality of learning and increase their knowledge base. During the semester, at the end of each class students received a list of ''learning goals'' for the next lecture. These goals were revisited at the start of the following lecture.

e. Results.

In both studies (1&2) Although the SES achievement gap persisted (high SES students performed better), low SES students performed significantly better on mastery-oriented tasks than they did on performance-oriented exams.

To conclude: Empirical data support the idea that low-SES students can perform as well as high-SES students if they are led to understand assessment as part of the learning process, a way to reach mastery goals, rather than as a way to compare students to each other and select the best of them, resulting in performance goals.

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