

A Glitch in the Feedback Loop: The Impact of Onscreen Praise on Children's Post-Failure Performance and Behavioural Self-Handicapping

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Alex and Jamie are sixth class pupils in an Irish primary school. Completing an exercise on the classroom computers, one screen fills with praise for the pupil's effort while the other learner receives plaudits based on their ability.

Which pupil is more likely to improve their performance next time? Who enjoyed the exercise more? And, why may one interpret the onscreen message as a reflection of their own perceived lack of intelligence?



Introduction

- Educational policy repeatedly emphasises the need for teachers to provide feedback to students (Education Act, 1998; NCCA, 2007)

However...

- Research is divided as to which type of feedback is most effective in boosting learner motivation, perseverance and autonomy (Amemiya & Wang, 2018)
- Following incidences of success, verbal **ability praise** ("You're very smart") and **process praise** ("You worked really hard. This strategy was particularly effective") engender similar responses (Skipper & Douglas, 2012)

But what happens when children encounter setbacks?

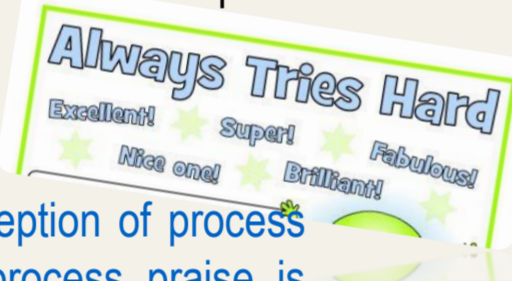
- Verbal **Process praise** was found to best serve learners following setbacks in terms of motivation, enjoyment, persistence and post-failure performance (Xing et al., 2018)

Great! Except...

- Children appear to develop an **antagonistic perception of process praise and ability** from the age of 11 years; **process praise** is understood as a consolation for low ability (Graham & Taylor, 2014).

"failure following effort is often viewed as compelling evidence that one lacks ability" (De Castella et al., 2013, p. 861)

- For children of this age, research contends that verbal **ability praise can damage self-worth** (Covington, 1992)
- Often results in **self-worth protective strategies**, such as **behavioural self-handicapping**; **deliberately restricting task time**, to create a plausible excuse for possible failure



Need for Further Research

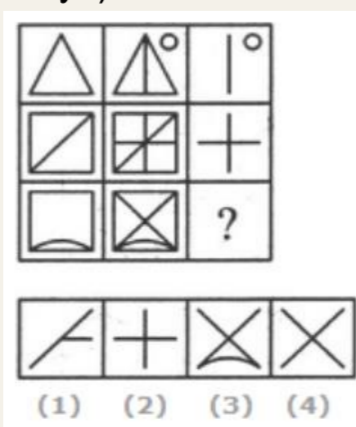
- Previous research omitted a **control group who received objective informational feedback (OIF); a score** (Kamins & Dweck, 1999; Mueller & Dweck, 1998)
- Lack of research examining the **effect of onscreen feedback** despite growing role of electronic devices in academia. Feedback is not a "one-size-fits-all" approach, thus strengthening the **need for culturally relevant research** (Amemiya & Wang, 2018, p. 201)
- Inequitable familiarity with experimental tasks** prior to research (Xing et al., 2018)

Accordingly, this research employed an independent measures experimental design to examine the **effect of onscreen ability praise, process praise and OIF** on fifth and sixth class pupils' **task enjoyment, task persistence, post-failure performance, failure attributions and behavioural self-handicapping**.

Participants and Materials

85 fifth and sixth class students were recruited from three primary schools in the Munster region ($M = 11.44$ years, $SD = 0.57$; 46 girls, 39 boys).

- Researcher-provided laptops
- Three sets of ten non-verbal reasoning matrices (Indiabix, 2019); **Set 2** significantly more difficult ($p < .001$)
- Online **Google Forms** survey
- Six-point Likert-type scale questions to assess task Persistence, enjoyment (Mueller & Dweck, 1998) and failure attributions (Xing et al., 2018)



(1) (2) (3) (4)

A. 1

B. 2

C. 3

D. 4

Figure 1: Non-verbal reasoning matrix

How much would you like to take a set of these problems home to work on?

How likely is it that your score was because of not working hard enough?

Mueller & Dweck, 1998

Xing et al., 2018

- Stopwatch to time each set of matrices

Behavioural self-handicapping was operationalised as the time spent working on third set of matrices after the setback of a low score

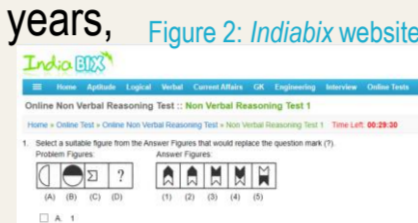


Procedure

Pilot Study

Aim: to rank non-verbal reasoning matrices sourced from *Indiabix* according to difficulty

- Obtained consent from principal, class teacher, one parent/guardian and assent from children
- Invited 24 fifth and sixth class students ($M = 12.13$ years, $SD = 0.54$; 12 girls; 12 boys) to solve 35 matrices



Main Study

- Obtained consent and assent using same processes as pilot study
- Introduced children to one method for solving matrices at whole class level
- Withdrew children in groups of three to a room adjacent to classroom with three laptops
- Children randomly assigned to experimental groups based on the laptop they chose to work on

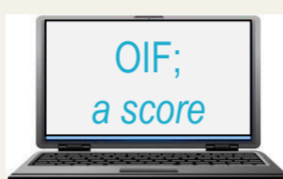


Figure 3: Random self-allocation to experimental groups

- Figure 4 illustrates the online survey procedure

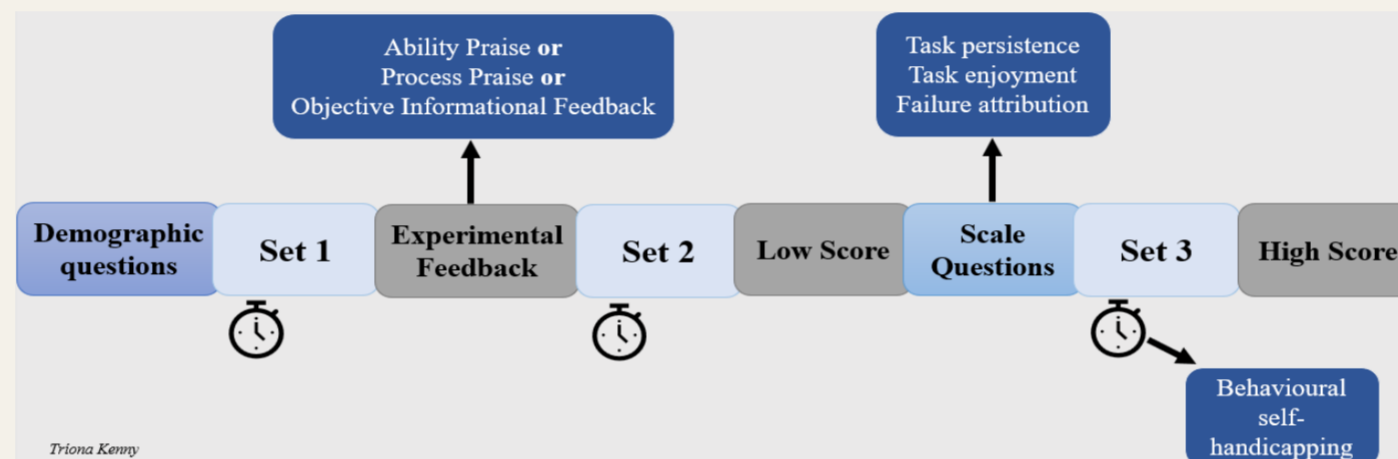


Figure 4: Online survey procedure

- Children had four minutes to work on each set of 10 matrices
- Children received onscreen feedback according to their experimental group following Set 1:

Ability Praise: *Wow you did a great job! You got 80% correct. You must be very clever*

Process Praise: *Wow you did a great job! You got 80% correct. You worked very hard and used some great strategies*

OIF: *You got 80% correct*

- Each child received the same onscreen feedback following Set 2:

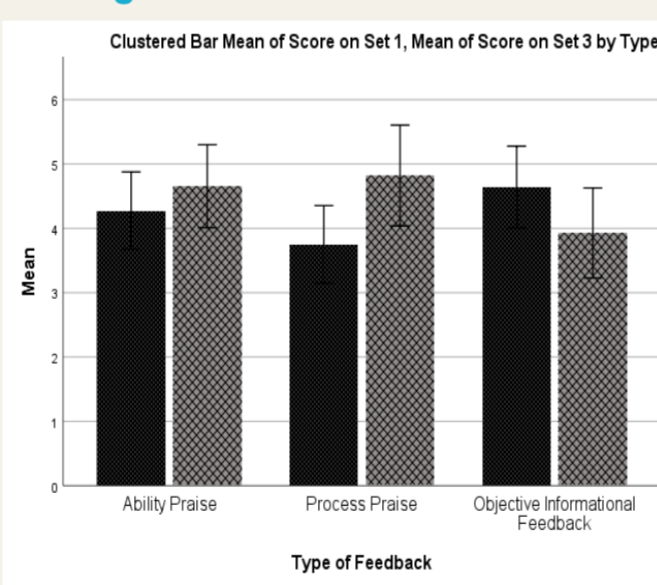
It looks like you had some trouble with these difficult problems- you performed poorly on them because only 30% of your answers are correct

- Children responded to scale questions read aloud by the researcher
- Children attempted Set 3 for up to four minutes
- Children were debriefed verbally and provided with an opportunity to ask questions

Results

Preliminary analyses illustrated that during **Set 1** experimental groups did not vary significantly in cognitive ability ($X^2(2, n = 85) = 4.41, p = .11$) or behavioural self-handicapping ($X^2(2, n = 85) = .45, p = .8$). Therefore, any subsequent differences arose from the feedback administered.

Change in Pre- and Post-Failure Performance



A mixed between-within subjects ANOVA found a **significant interaction effect between changes in scores and feedback type**, Wilks' Lambda = .88, $F(2, 82) = 5.74, p = .005$, partial eta squared = .12.

Figure 5: Change in pre- and post-failure scores

Post-Failure Persistence & Enjoyment

While a Kruskal-Wallis test did not find a significant difference in task persistence ($X^2(2, n = 85) = .99, p = .61$) across feedback groups, **children who received process praise reported the highest levels of persistence**. A MANOVA failed to detect a significant difference in task enjoyment $F(6, 160) = .41, p = .88$; Wilks' Lambda = .97; partial eta squared = .02, across the experimental feedback groups, although **children who received process praise reported the highest levels of task enjoyment**.

Failure Attribution

A series of Kruskal-Wallis tests found no significant difference between feedback type and failure attribution. However, **children who received ability praise were most likely to attribute failure to low ability** ($Md = 4, IQR: 3-6$).

Effect of Feedback on Behavioural Self-Handicapping

A one-way between-groups analysis of covariance (ANCOVA) found no significant difference between the employment of behavioural self-handicapping and feedback type, $F(2, 81) = 1.38, p = .26$, partial eta squared = .04. Nevertheless, **children who received process praise illustrated the highest levels of behavioural self-handicapping** ($M = 03:27$ minutes, $SD = 00:37$).

Discussion

- Onscreen process praise may have been interpreted as unspecific to the individual child, thus adversely affecting enjoyment
- Children who received process praise may have outperformed other groups on the post-failure set as a result of perceiving process praise as a summons to match others' innate intelligence
- In concurrence with research examining verbal feedback, children who received onscreen ability praise were most likely to attribute poor performance to low ability
- Given that self-worth in education is maintained by the ability to achieve, children who received process praise may have attributed failure to an external factor (*lack of time*) to prevent peers from associating their poor performance with a lack of innate intelligence
- Children who received process praise may be at risk of becoming dependent on self-worth protective strategies in an effort to pursue performance-oriented goals



Implications for Parents & Educators



Instill a perception of failure as a learning opportunity

Model positive responses to setbacks and respond appropriately to children's successes and failures

Implement **growth mindset** or **incremental theory of intelligence** interventions; *improved failure-responses across socioeconomic status and geographical location*

Nurture a classroom ethos of individual development rather than achievement

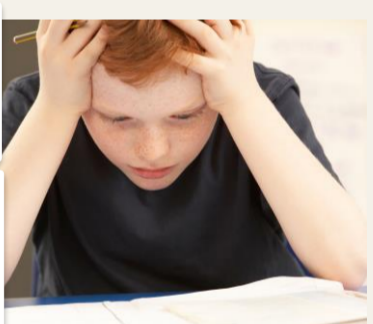
Avoid performance-oriented classroom routines; *rewards for particularly high scores on weekly spelling tests*

Teach self-protective approaches that do not threaten performance; *self affirmation* (Alter & Forgas, 2007)

Implications for self-worth theory

Onscreen process praise, rather than ability praise, results in greater use of behavioural self-handicapping

Given distorted perception of praise, children who receive process praise are increasingly likely to feel the need to prove their intelligence



Process praise may induce heightened pressure as learners are cognisant of the visibility of their effort

Validity, Limitations & Recommendations

- Population validity strengthened by recruiting participants from multiple schools
- Ecological validity strengthened by collecting data in children's own school environment
- Non-parametric tests may have failed to detect significant differences that actually exist
- Completing the experiment on an individual basis may produce a more accurate measure of behavioural self-handicapping

Future research may benefit from a longitudinal design examining the development of praise perceptions, a between-groups design to compare onscreen, verbal and written feedback or from adopting a holistic approach to investigate mediating factors (*parental attitudes, socioeconomic status*) on perceptions of praise

Key References

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Acknowledgements

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