Structural validation of a feedback perceptions questionnaire

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Abstract: The efficiency of feedback content has received much attention in prior feedback research, but students' feedback perceptions have hardly been studied. A structural validation was conducted of a feedback perceptions questionnaire amongst 1535 secondary education students. The structural validity of the scales was confirmed: fairness (FA), usefulness (US) and acceptance (AC) constitute the joined component 'Perceived Adequacy of Feedback' (PAF), which in turn positively predicts willingness to improve (WI) and affect (AF).

Feedback content and perceptions

In instructional contexts the term "feedback" refers to all post-response information which informs the learners on their actual state of learning and/or performance (Narciss, 2008). Several recent reviews of research on feedback adopt a multidimensional view of feedback (Hattie & Timperley, 2007; Narciss, 2008; Shute, 2008). Widely investigated types of feedback are (a) simple feedback types providing outcome-related information, and (b) elaborated feedback types providing additional information besides outcome-related information (Narciss, 2008). The question of which feedback content is most efficient (i.e., which has the most beneficial effects on performance) has received much attention in prior feedback research. The issues of how learners perceive feedback content and how the perceptions relate to performance have not been addressed explicitly.

The perception of feedback – if measured – is commonly measured in terms of the single dimension 'usefulness', after the feedback has been applied and/or at the end of the task (Kwok, 2008). Yet, several authors have emphasised the 'mindful processing' of feedback as a critical factor for feedback efficiency (Kluger & DeNisi, 1996; Narciss, 2008). In instructional contexts there are at least five feedback sources, i.e. the teacher, peer, parents, book and/or computer-based environment, and the task (Hattie & Timperley, 2007). Depending on the source's characteristics, feedback content might be perceived as less useful or less credible, and affect task completion or learning differentially. Thus far the measurement of feedback perception has been neglected in feedback research. This study investigates the structural construct validation of a multidimensional feedback perceptions questionnaire.

Method

The sample consisted of 1535 pre-university and senior general secondary education students in the Netherlands from 130 schools. There were 817 female and 713 male students and their mean age was 15.75 (SD = 1.19). Participation to the study was based on informed consent. Students were presented with a scenario in which a fictional student received feedback by a fictional peer (in the context of the task of 'writing a business letter'). Feedback content was Concise General (CGF) or Elaborated Specific (ESF). CGF contained solely general remarks regarding the quality of the performance, whereas ESF provided the position and error type, as well as information on how to proceed. We used the Strijbos, Narciss and Dünnebier (in press) multidimensional 18-item feedback perceptions questionnaire. This questionnaire measures feedback perceptions in terms of fairness (FA), usefulness (US), acceptance (AC), willingness to improve (WI) and affect (AF). Questionnaire items were measured on a 10 cm bi-polar scale from 0 (fully disagree) to 10 (fully agree). Four scales consist of three items (FA, US, AC and WI). Affect was measured with three positive items and three negative items.

Confirmatory factor analysis

We conducted confirmatory factor analyses using Structural Equation Modelling (SEM) in EQS version 6.1. To interpret a model's fit, the following indicators were used: SRMR and RMSEA below 0.10 is considered adequate fit and below 0.05 an excellent fit, and CFI scores above 0.90 indicate adequate fit and above 0.95 excellent fit; and as the χ^2 statistic becomes increasingly unreliable in sample sizes > 250 it was not used as a criterion for model fit (Byrne, 2006).

SEM on all 18-items – with a common factor PAF for FA, US and AC items, and a common factor for all AF items – yielded a very weak fit, $\chi^2(127)$ = 2752.36, CFI = .799; SRMR = .189; RMSEA = .116. We then conducted a separate analysis for the common factor PAF and a separate analysis for WI+AF. SEM was used to confirm the second-order factor structure of PAF (with correlated errors for negatively worded items AC2 and AC3). The proposed second-order factor structure fitted adequately, but a high RMSEA indicated poor fit,

$\chi^2(22) = 576.07$, CFI = .929, SRMR = .051, RMSEA = .128. Inspection of LM-multipliers suggested that item FA1 was more indicative of the US scale. This change resulted in a excellent model fit, $\chi^2(22) = 350.52$, CFI = .958, SRMR = .039, RMSEA = .098. We then tested the proposed correlated first-order structure of WI+AF. The initial correlated factor model fitted poorly, $\chi^2(26) = 1390.903$, CFI = .612, SRMR = .143, RMSEA = .185. Inspection of the LM-multipliers suggested a positive wording effect in the AF scale due to both negatively and positively worded items. Correlating errors for the positively worded AF items yielded an excellent fit, $\chi^2(23) = 278.26$, CFI = .927, SRMR = .070, RMSEA = .085). Tests for measurement invariance for type of feedback (CGF vs. ESF) and gender (Male vs. Female) revealed strong factorial invariance. Finally, to test the theoretical relationship between PAF, WI and AF, a path analysis was conducted using SEM (Figure 1). Modelling PAF as a predictor of WI and AF yielded a good fit, $\chi^2(122) = 1636.07$, CFI = .884, SRMR = .074, RMSEA = .090.
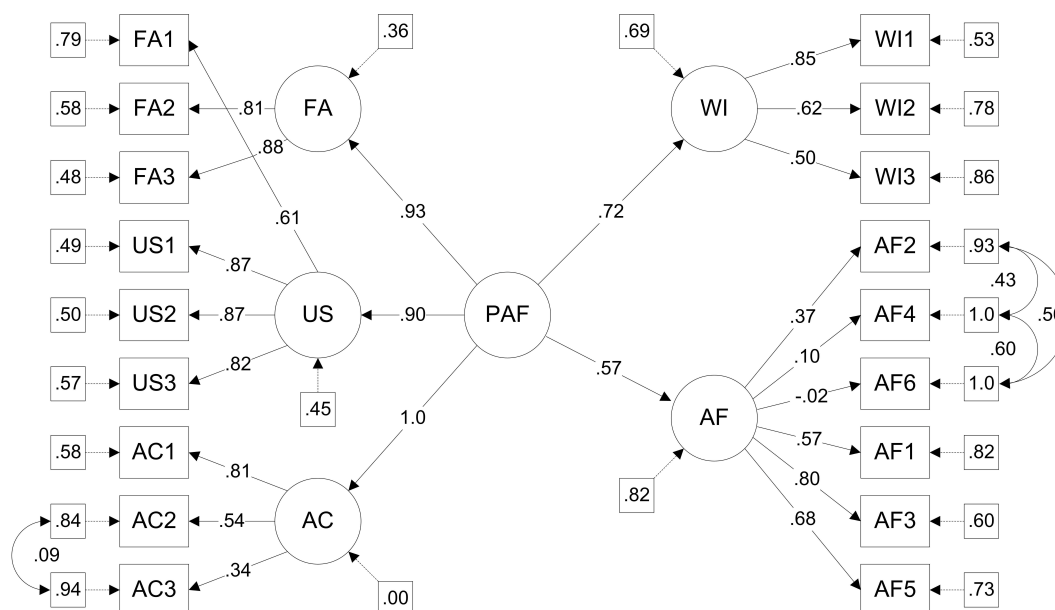

Figure 1. Path estimates and first and second order loadings [FA = fairness; US = usefulness; AC = acceptance; PAF = perceived adequacy of feedback; WI = willingness to improve; AF = affect].

Discussion

The results clearly reveal that students' feedback perception – in terms PAF, WI and AF – can be adequately captured. In addition, WI and AF were correlated – yet distinct measures. PAF was confirmed as a predictor of WI and AF. Both the PAF and WI+AF part of the questionnaire were invariant across both types of feedback as well as gender. Given the increased recent interest for feedback practices (between peers or by a teacher) in view of formative purposes of assessment, students' perception of feedback they receive could be a crucial determinant of how they treat the feedback and possibly help to uncover why elaborated feedback types are not always more efficient. With this questionnaire researchers can now reliably and validly investigate possible relations between feedback perceptions, subsequent performance and feedback efficiency.

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