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# Validity of comparative judgement to assess academic writing: examining implications of its holistic character and building on a shared consensus

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## ABSTRACT

Recently, comparative judgement has been introduced as an alternative method for scoring essays. Although this method is promising in terms of obtaining reliable scores, empirical evidence concerning its validity is lacking. The current study examines implications resulting from two critical assumptions underpinning the use of comparative judgement, namely: its holistic characteristic and how the final rank order reflects the shared consensus on what makes for a good essay. Judges' justifications that underpin their decisions are qualitatively analysed to obtain insight into the dimensions of academic writing they take into account. The results show that most arguments are directly related to the competence description. However, judges also use their expertise in order to judge the quality of essays. Additionally, judges differ in terms of how they conceptualise writing quality, and regarding the extent to which they tap into their own expertise. Finally, this study explores diverging conceptualisation of misfitting judges.

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## Introduction

Teaching academic writing is about informing students how to write essays and journal articles. Consequently, the best way of assessing students' writing ability is by letting them write such essays and articles. Due to the openness of writing assignments, students vary greatly in their responses. This makes scoring of essays a complex process (Moss, 1994). In terms of writing assessment, the discussion on which scoring method is most suitable is still ongoing (Azarfam, 2012). Most commonly, absolute analytic scoring using criteria or rubrics is relied upon. In this scoring method, judges make an absolute decision regarding predefined criteria in order to grade a single essay on its quality. However, concerns have been raised regarding the validity of these scores.

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These validity concerns comprise three different problems related to scoring essays using rubrics. Firstly, research shows that judges differ in how they conceptualise good writing (Bloxham, 2009). They interpret criteria and essays differently, which can lead to disagreement about the scores. Consequently, this raises problems regarding intra- and inter-rater reliability. Secondly, although criteria can guide the attention of judges to several predefined dimensions (Azarfam, 2012), it has been argued that discerning all relevant criteria in advance harms validity: not every essay may match the criteria (Jones & Alcock, 2014; Sadler, 2009) and criteria may show overlap. Subsequently, judges may adjust scores on sub-criteria to make the final score reflect how they, personally, define the quality of the essay. Finally, although scoring essays using rubrics is depicted as a process of absolute scoring, research shows that judges often make relative judgements: an essay is compared to other previously scored essays or to judges' internal abstract representation of a 'good' essay (Bloxham, 2009; Crisp, 2013). Hence, scores depend on the order in which essays are evaluated or on judges' internal representations of a good essay, instead of being rooted in the quality of the essay itself. To counter these validity problems, an alternative can be found in the recent work of Pollitt and others on comparative judgement (CJ) (e.g. Jones, Swan, & Pollitt, 2015; Pollitt, 2012a, 2012b).

### **Comparative judgement: a promising alternative**

CJ has its roots in the work of Louis Thurstone (1928) on the measurement of opinions and attitudes. Thurstone's 'Law of Comparative Judgement' states that people are more reliable in comparing two stimuli, for example: essays, than in assigning scores to individual stimuli (Thurstone, 1927). More recently, this claim has been repeated by Laming who amplifies the initial thoughts of Thurstone by stating 'all judgements are comparisons of one thing with another' (2003, pp. 7–8). The CJ approach uses the strength of human judgement, by asking judges to compare two pieces of student work, and then decide which of the two is better in terms of the assessed competence (Greatorex, 2007). Consequently, judgement is, in contrast to absolute scoring methods, always relative. Based on multiple comparative judgements, a rank order of essays is generated according to the quality of their writing. This rank order is based on all decisions made across judges, and results in reliability estimates ranging from .73 (Jones & Alcock, 2014) up to .98 (Heldsinger & Humphry, 2010) as described in Bramley (2015). CJ has been applied to the assessment of a wide range of competences (e.g. mathematics, Jones, Inglis, Gilmore, & Hodgen, 2013; geography, Whitehouse & Pollitt, 2012) including writing (Heldsinger & Humphry, 2010, 2013; Humphry & McGrane, 2015; Pollitt, 2012b). With regard to CJ, validity is rooted in its holistic character and in the shared consensus across judges on what constitutes good writing (Jones et al., 2015; Whitehouse & Pollitt, 2012). Research into the validity of CJ is scarce.

### **Putting the validity of CJ to the test**

In this study, these two critical assumptions underpinning the validity of CJ will be investigated. To challenge these assumptions, the implications arising from them will first be identified and their critical aspects will then be discussed (Kane, 2013).

### ***Holistic character of CJ***

A critical assumption underpinning CJ is its reliance on holistic judgement. Judges do not receive criteria to guide their judgement process, but only a general description regarding the writing competence to be assessed. Although this description steers judges in their evaluation of the writing construct, judges are not tied to predefined criteria. Consequently, they can decide individually how different aspects of good writing are valued. This implies that CJ allows judges to vary in the way they conceptualise good writing. The literature on scoring using rubrics indicates that judges differ in their conceptualisation in both focus and broadness. Some judges develop a specific focus regarding the various dimensions of writing they pay attention to (Eckes, 2008; Sakyi, 2000) and regarding the weight given to these dimensions. Moreover, judges also range from having a broad view, focussing on several elements at once, to a narrow view, focussing only on a limited set of elements. Variation between judges in terms of focus and broadness is allowed and even valued within CJ. However, up to now, it is unclear whether and to what extent CJ allows judges to differ in conceptualisation. A second implication of the holistic character claimed by its proponents is its building on expertise (Jones et al., 2015). By freeing judges from predefined criteria, CJ is said to enable judges to tap into their expertise, which is assumed to enhance the validity of scoring essays using CJ. Notwithstanding the critical and questionable status of this claim, it is, again, not backed up with empirical evidence.

Another consequence of this reliance on the expertise of judges is its trust in judges' ability to discern between essays on relevant features of the competence (Bramley, 2007). The latter is important because judges should base their decisions on construct-relevant features of the essays while avoiding to let irrelevant features influence their decision (Messick, 1989). To the best of our knowledge, Whitehouse (2012) conducted the only study that looked into what features of (geographical) essays judges took into account while deciding on the best essay. She asked judges after each comparison to provide comments about their reasons for a specific judgement. Examination of these comments indicated that most arguments were in line with the assessed competence, which is a precondition to claim validity in terms of the rank order. Whitehouse (2012) attributed these results to the existence of a community of practice on assessment originating from examination training (for national testing programmes), published mark schemes and general statements with regard to the assessed competence. She questions the extent to which judges base their judgement on construct-relevant features can be accomplished in settings where such a community is absent.

### ***Shared consensus***

The use of CJ is also built on the claim that rooting the final rank order in the shared consensus across judges adds to its validity. This claim is justified by pointing to the fact that each essay is looked at by multiple judges, which makes the final score a reflection of the judges' collective expertise (Jones et al., 2015; Pollitt, 2012b). This implies that the shared conceptualisation of writing quality and judges' collective expertise defines the final rank order. However, since judges are allowed to vary in their conceptualisation of what constitutes good writing, it is unclear whether or not the final rank order covers every dimension of good writing. For example, imagine every judge basing his/her decisions solely on the structure of essays than it is arguable if the final rank order represents a scale in writing.

As Messick (1989) emphasised, full construct representation is a necessity to claim validity (Messick, 1989). The extent to which the shared consensus within CJ realises full construct representation cannot be taken for granted and needs empirical underpinning.

Furthermore, in previous studies of CJ, judges are identified as taking decisions that deviate from the shared consensus (Pollitt, 2012b). These judges are labelled as ‘misfit’ and statistically identified by examining the extent to which judges make unexpected decisions (Pollitt, 2012b. See Pollitt, 2012a, 2012b for an extended explanation of the identification of misfitting judges). A misfitting judge can either be judging too inconsistently compared to the average judge by taking too many unexpected decisions or judging too consistently compared to the average judge. However, within CJ, misfit statistics have to be interpreted relatively. Misfit statistics quantify the extent to which judges are misfit compared to the whole of judges (Pollitt, 2012b). It is suggested that judges with the highest misfit statistic may have a diverging conceptualisation of the competence to be assessed (Bramley, 2007; Whitehouse & Pollitt, 2012). Empirical evidence underpinning this suggestion is lacking. Furthermore, it is unclear whether this divergence in conceptualisation refers to the focus or the broadness of the judgements, or to both. Misfit judges may be focusing on construct-irrelevant features, or take into account too few or too many arguments when making decisions.

## **This study**

This study examines the implications of the holding of two critical assumptions underpinning the use of comparative judgement (CJ) for the assessment of academic writing: specifically, its reliance on holistic judgement and its rooting of the final rank order in the shared consensus across judges.

In this study, judges’ arguments as to why they choose one essay above another are examined to investigate whether or not the shared consensus across judges covers the whole of argumentative writing (RQ1) because full construct representation is required to underpin the claim of validity (Messick, 1989). Following this, the degree to which the holistic character of CJ enables the tapping of judges’ expertise is tested (Jones et al., 2015) (RQ2). Furthermore, the validity of CJ is said to be enhanced by allowing judges to vary in what they conceptualise as ‘good academic writing’. Since empirical evidence underpinning this variation in conceptualisation within CJ is lacking, this study will examine to what extent judges differ in focus and broadness in terms of their conceptualisation regarding academic writing. Also variation in judges’ use of expertise will be examined (RQ3). Finally, previous studies suggest that misfitting judges (i.e. judges statistically deviating from the shared consensus) may show a conceptualisation that diverges from the shared conceptualisation across judges (Bramley, 2007; Whitehouse & Pollitt, 2012). This is explored by comparing differences in focus and broadness of arguments provided by non-misfitting and misfitting judges (RQ4).

## **Methods**

### ***Context of the study: course and competence***

The explorative study is carried out in a course that is part of a pre-Master’s programme at a Flemish (Dutch-speaking part of Belgium) university. Within this course, students’ skills

in academic writing are assessed. Academic writing is thereby operationalised as the extent to which students can write an argumentative essay that synthesises scientific literature and applies general guidelines with regard to academic writing (i.e. the structure of a scientific article, the APA rules). Students have to write a review article of 700 words that integrates the insights of three academic research articles on one specific topic. For this study, 41 essays of one examination period are selected (June 2013). The essays covered one of the following topics: teacher learning, feedback seeking, effectiveness of school inspection and the relationship between self-determination and students' involvement. The essays were anonymously presented to the judges.

### **Judges**

As the papers are targeted at an academic audience, professors and researchers acted as judges. Eleven researchers were asked to participate in this study. Although they are experienced in reading and writing academic articles, these judges do not have a shared experience or a common training in evaluating essays. Judges varied in expertise with regard to the assessment of academic writing, ranging from almost no experience of assessing essays to highly experienced. All judges worked at the department where the study took place, indicating that they were familiar with the topic. However, none of the judges was involved in the academic writing course.

Therefore, judges were provided with information on the course before they started their judgements: the description of the competence 'academic writing', as well as the assignment that was given to the students. Judges did not receive a rubric list with which to judge the essays, nor training, but were explicitly instructed to assess the academic writing of students by comparing two essays and deciding which was better. Judges were told to keep the provided description of academic writing in mind during the judgement process in order to enhance alignment with the task. The competence description is given below (translated from Dutch):

The student knows the most important principles underpinning academic writing and is able to apply these principles. More specifically:

- The student has insight into the most important principles underpinning academic writing.
- The student is able to write an argumentative text and to synthesise in a scientific manner.
- The student can apply the APA rules.
- The student has insight into the structure of a scientific article (including abstract, problem statement, conclusion and discussion).

### **Data gathering**

Pairwise comparison data were collected in 10 judgement rounds following the approach described by Pollitt (2012a, 2012b). In the whole judgement exercise, 236 comparisons of all possible comparisons (236/820 comparisons = 28.8%) were made. Each essay was assessed by 4–9 judges and compared to at least 8 and, at most, 16 other essays. The pairwise comparison data were modelled according to the Bradley–Terry–Luce model (Bradley

& Terry, 1952; Luce, 1959) using the R-package BradleyTerry 2 (Turner & Firth, 2012). Rank ordering the 41 essays from worst to best resulted in an 'academic writing' scale with acceptable reliability (Scale Separation Reliability = .84).

To answer the research questions, qualitative data were gathered. After each comparison, judges were asked to explain why they made their decision using the following prompt: 'Briefly explain why you took this decision.' It was decided to not compel judges to answer this question because this might result in less intuitive answers, and could potentially distort the judgement process (Whitehouse, 2012). Nevertheless, judges provided an explanation for 229 of the 236 decisions (97%). As some judges provided multiple reasons for one decision, answers were divided into segments. Segments are the most basic part of the raw data that can be assessed in a meaningful way regarding the phenomenon (Braun & Clarke, 2006). This means that in the current study, every (part of a) sentence informing as to why a judge made a certain decision is a separate argument. These segments are the unit of research.

This segmentation resulted in 996 arguments. So, on average, 4.35 arguments were given per decision. Subsequently, these arguments were screened with regard to their information. Arguments were considered to be not useful if they did not refer to why a judge had chosen one of the two papers. These arguments concerned mainly the difficulty of the decision (e.g. 'difficult decision' (judge A, round 9)). Omitting these arguments resulted in 967 arguments that were retained for analysis.

An initial coding scheme was developed based on the competence description, and informed by an existing coding scheme developed by Cumming, Kantor, and Powers (2002). This coding scheme focused on the content of the arguments provided, and their relationship with the competence description provided to the judges. To test the initial coding scheme, two researchers independently coded the arguments belonging to the first two judgement rounds. Unclear arguments were discussed, and the initial coding scheme was slightly adjusted. Again, the same two researchers independently coded arguments of two other judgement rounds. This resulted in substantial inter-rater agreement (round 9 kappa = .6; round 10 kappa = .74) (Stemler, 2001). One researcher coded the arguments of the remaining judgement rounds. The researchers discussed every unclear argument.

The final coding scheme discerns three categories of arguments: arguments related to the assessed competence and to the competence description (category 1), arguments related to the assessed competence but unrelated to the competence description (category 2) and arguments referring to the general quality of the essays (category 3). Each category consists of several types of arguments that further specify the general category (e.g. APA and structure for category 1). The coding scheme, with examples of quotes, can be found in Table 1. The qualitative data were quantified by counting how often each type of argument was used. These counts were transformed to the relative frequency with which every type of argument was used.

## Analyses

To warrant full construct representation (RQ1), every aspect of academic writing that is defined within the competence description should be backed by arguments. As the arguments within category 1 are directly related to the competence description, an overview of the relative frequencies of the different types of arguments within this category will be given to answer RQ1. However, judges might have provided other construct-relevant reasons not



**Table 1.** Relative proportion of the three categories of arguments including quotations ( $N = 967$ ).

Code	Quote	Percentage
<b>Category 1: Arguments referring to the competence description</b>		<b>67.7</b>
Structure	'Clear structure' (round 8, judge D)	20.2
Analysis/synthesis	'There should be more synthesising, instead of just a summary of the article' (round 6, judge B)	11.0
Problem definition	'The problem statement could be formulated more strongly' (round 9, judge I)	10.8
APA	'APA rules aren't used properly for quoting' (round 3, judge E)	8.1
Conclusion	'Paper 12 draws conclusions about things not described in the paper' (round 5, judge H)	5.7
Abstract/title	'Abstract matches better with the content of the article' (round 9, judge G)	4.6
Argumentation	'Is a decent argumentative text' (round 4, judge B)	3.9
Discussion	'Also, the limitations and additional research opportunities are strongly underpinned in paper 35' (round 8, judge G)	3.4
<b>Category 2: Arguments related only to competence</b>		<b>25.6</b>
Style	'Paper 26 has a more fluent style' (round 2, judge K)	15.4
Content aspects	<i>This covers the following aspects:</i> <i>Content:</i> 'I doubt if this paper represents the articles in a right ...' (round 7, judge G) <i>Introduction:</i> 'The introduction of paper 41 is remarkably worse: it is a mix of data which belongs in the problem statement and in the result part' (round 2, judge J) <i>Originality:</i> 'Interesting research question' (round 10, judge F) <i>Relevance:</i> 'More attention is paid to the practical embedding/significance' (round 5, judge F) <i>Definition concepts:</i> 'Lack of clarification of concepts' (round 7, judge B)	6.4
Language errors	'The same number of spelling and grammar errors' (round 9, judge G)	3.6
Layout	'The layout was also a lot less attractive' (round 5, judge A)	.2
<b>Category 3: General arguments</b>		<b>6.6</b>
General quality	'Corresponds more to the standards of a scientific paper' (round 4, judge C)	6.0
Task fulfilment	'..., it is hardly a review' (round 4, judge B)	.6

directly related to the competence description (category 2) for picking a certain essay. This category of arguments is assumed to reflect judges' use of expertise. As such, examining to what extent judges used this category in general, and the different types of arguments within this category, specifically provides evidence regarding the extent to which CJ enables judges to tap into their expertise (RQ2).

To explore differences between judges in terms of the conceptualisation of academic writing (RQ3), their variation in expertise, focus and broadness, reflected in the arguments they provided, will be examined. Firstly, since arguments only referring to the competence and not the competence description (category 2) are assumed to reflect judges' use of expertise, the variation between judges in the relative use of the three main categories of arguments will be examined. The significance of differences will be tested using the  $\chi^2$  statistic.  $w$  will be reported as effect size. This effect size is based upon Cramer's  $V$ , and takes into account the number of rows and columns of the matrix. To interpret  $w$ , the following guidelines will be used: .10–.29 is a small effect, .30–.49 is a medium effect and  $\geq .50$  is a strong effect (Volker, 2006). Secondly, using the same approach, judges' differences in focus will be investigated by examining differences in judges' relative share of the various types of arguments used. This will be done for the arguments within category 1 and category 2 separately. Finally, to check whether judges vary in broadness, an ANOVA will be performed to test whether judges differ in the average number of arguments provided per comparison.  $\eta^2$  indicates effect size, using Cohen's rules (1988;  $> .14$  = strong effect,  $> .06$  = medium effect,  $> .01$  = small effect).

To understand the need for a shared conceptualisation from a misfit perspective (RQ4), misfit judges' conceptualisation will be compared to that of the average non-misfitting



judge. Misfitting judges will be identified by their information-weighted mean square value (infit). Infit measures indicate the extent to which judges take unexpected decisions and are preferred over outfit measures because the first are the most robust (Pollitt, 2012b; See Pollitt, 2012a, 2012b for an explanation and formula for infit and outfit). Following the stringent approach suggested by Whitehouse and Pollitt (2012), judges will be labelled as misfit if their infit value is one standard deviation above or below the mean infit value. To investigate differences in focus and broadness between misfitting and non-misfitting judges, a similar approach as for RQ3 will be used. Due to the small sample size, differences in focus can only be examined for types of arguments across all categories. Because the data could not fulfil the assumption regarding normal distribution, a Mann–Whitney test will be performed to test for significance of differences in focus found instead of a  $\chi^2$ -test. The Mann–Whitney test takes the rank order of the most used arguments of the misfitting judge and compares it to the rank order of most used arguments of the sum of all non-misfitting judges. For calculating the effect size,  $Z$  is divided by the squared total number of samples, interpreting  $r > .5$  as a large,  $r > .3$  as a medium and  $r > .1$  as a small effect size (Field, Miles, & Field, 2012). To test for the significance of differences in broadness, a t-test will be performed on the average number of arguments provided per comparison by misfitting and non-misfitting judges. Cohen's  $d$  indicates the strength of the effect with  $d > .8$  representing a strong effect,  $d > .5$  a medium effect and  $d > .2$  a small effect (Cohen, 1988). All analyses are performed using R.

## Results

### *Full construct representation of academic writing and tapping of judges' expertise*

To obtain an insight into the extent to which the final rank order fully represents academic writing, we have investigated whether or not every dimension of academic writing, as defined by the competence description, is backed by arguments provided by the judges. As shown in Table 1, almost 70% of the arguments provided refer directly to the competence description (category 1). Within this category of argument, every dimension of academic writing related to the competence description (e.g. argumentation; APA) is backed by judges' arguments. However, the relative share of different dimensions varies. The arguments mostly used refer to the structure of the essay (20.2%), the degree of analysis and synthesis (11%), the problem definition (10.8%) and to the application of the APA norms (8.1%). Other types of arguments are named less frequently. Arguments related to the discussion (3.4%), to the argumentation students' used (3.9%), to the abstract or title of the essay (4.6%) and to the conclusion (5.7%) have a relatively low share.

Furthermore, two other categories of arguments are identified: arguments relating to the general quality of the essays (category 3 in Table 1) and arguments related to the competence assessed, but not referring to the competence description (category 2 in Table 1). Arguments falling under category 2 can be seen as evidencing the ability of CJ to tap judges' expertise. About a quarter of all arguments (25.6%) can be categorised under this heading. These arguments mainly point at the style of the paper (15.4%), its content elements (6.4%) and language errors (3.6%). This is an indication of CJ's ability to tap into the expertise of judges. Finally, the general arguments (category 3) concern only 6.6% of all the arguments provided. These arguments refer to the general quality of the papers (6%) or the extent to

which students fulfilled the assignment (.6%). As it is unclear which specific features of the essays the judges took into account, their relationship to the competence assessed cannot be set.

### *Variety among judges: expertise, focus and broadness*

With respect to variations in the use of expertise, Table 2 shows that judges do differ in their use of the three main categories of arguments. Judges B, D, F, H and J give about two-thirds of arguments directly related to the competence description (range: 66.8–74.4%). The other third of the arguments are competence related, but do not refer to the competence description (range: 22.9–33.4%) indicating their use of expertise. Their share of general arguments (<3%) is negligible. Judges A and I also follow this pattern, although providing a little more general arguments (range: 5.5–6.8%). For judges E, G and K, the share of competence description-related arguments ranges from 64.3 to 79.1%. These judges provide fewer arguments indicating their use of expertise (range: 15.3–22.7%). Furthermore, judges E (13.6%) and G (13%) provide slightly more general arguments. Finally, only half of the arguments (51.2%) given by judge C are directly related to the competence description. This judge also provides the highest share of general arguments (34%) and the lowest share of arguments indicating his/her use of expertise (14.9%). The  $\chi^2$ -statistic points at the statistical significance of these differences ( $\chi^2(20) = 11.89, p > .001, w = .346$ ).  $w$  points to a medium effect. Judges do differ in their use of expertise.

Regarding variations between judges in terms of focus, examination of the differences in the use of the types of arguments within categories 1 and 2 evidences that judges vary in focus. Table 2 shows, for example, that within category 1 (arguments related to the competence description), most judges mainly focus at the structure of the essays. However, the second type of argument most commonly provided differs among judges. Judges A, B and K look, for example, most at analysis/synthesis, whereas judges E, F, G and I are more

**Table 2.** Arguments provided by judges A–K (%).

	Judges										
	A	B	C	D	E	F	G	H	I	J	K
<b>Category 1: Arguments referring to competence description</b>											
Overall	65.9	73.3	51.2	66.8	71.3	67.8	64.3	74.4	63.3	67.3	79.1
Structure	24.7	22.4	27.7	28.1	33.9	16.3	15.5	2.9	18.0	11.2	27.9
Analysis/synthesis	15.1	13.7	2.1	3.5	5.1	8.8	4.9	54.3	10.3	.0	24.4
Problem definition	11.0	9.8	4.3	7.0	17.0	13.8	13.0	.0	13.7	5.6	12.8
APA	2.7	11.5	4.3	5.3	5.1	7.5	7.3	5.7	3.4	21.5	5.8
Conclusion	9.6	7.7	2.1	1.8	3.4	6.3	6.5	5.7	3.4	6.5	4.7
Abstract/title	.0	.0	.0	14.0	.0	8.8	7.3	.0	7.7	13.1	1.2
Argumentation	1.4	4.9	6.4	1.8	5.1	1.3	4.1	2.9	6.8	1.9	2.3
Discussion	1.4	3.3	4.3	5.3	1.7	5.0	5.7	2.9	.0	7.5	.0
<b>Category 2: Arguments referring to the competence, but not the competence description</b>											
Overall	28.8	25.7	14.9	33.4	15.3	30.1	22.7	22.9	30.0	31.7	16.3
Style	13.7	18.6	8.5	21.1	11.9	15.0	12.2	20.0	15.4	16.8	12.8
Content aspects	11.0	6.0	.0	5.3	3.4	12.5	2.4	.0	13.7	6.5	1.2
Language errors	2.7	1.1	6.4	7.0	.0	1.3	8.1	2.9	.9	8.4	2.3
Layout	1.4	.0	.0	.0	.0	1.3	.0	.0	.0	.0	.0
<b>Category 3: General arguments</b>											
Overall	5.5	1.1	34.0	.0	13.6	2.6	13.0	2.9	6.8	.9	4.7
General quality	5.5	.0	34.0	.0	10.2	1.3	12.2	2.9	6.8	.9	4.7
Task Fulfilment	.0	1.1	.0	.0	3.4	1.3	.8	.0	.0	.0	.0

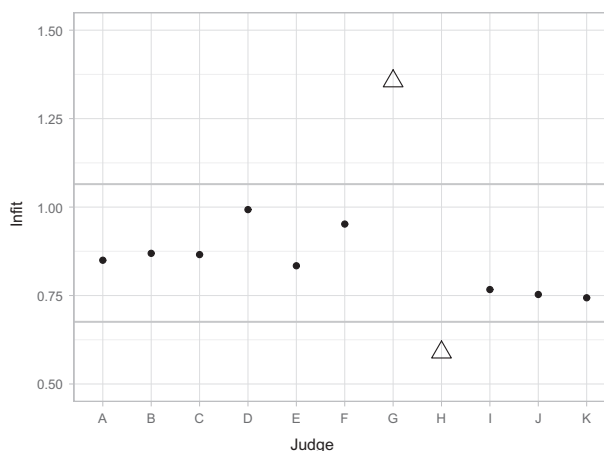
focused on the problem definition. Judges H and J have another focus. Judge H focuses mostly on analysis/synthesis (54.3%) and judge J on the APA rules (21.5%). The differences in judges' use of the various types of arguments within category 1 are statistically significant ( $\chi^2(70) = 564.89, p < .001$ ) and  $w$  points at a strong effect ( $w = .717$ ). The same applies to judges' variations in the use of arguments only related to the competence (category 2). The  $\chi^2$ -statistic is statistically significant ( $\chi^2(30) = 323.34, p < .001$ ) with  $w$  indicating a strong effect ( $w = .542$ ). From Table 2, it is clear that all judges mainly focus on style. However, the second aspect that judges focus on varies. Some judges (C, D, G, H, J and K) focus on language errors, while others focus on content aspects (judges A, B, E, F and I). For judge H, again, his/her strong focus on one kind of argument stands out (style, 20%).

Finally, judges are found to differ in terms of the broadness of their judgements. Some judges take more or fewer aspects into account to justify their decisions. As Levene's test returned statistically significant outcomes ( $F(10,225) = 2.639, p = .005$ ), an ANOVA not assuming equal variances is performed. The differences between judges in terms of the number of arguments per comparison are statistically significant ( $F(10,225) = 18.89, p < .001, \eta^2 = .456$ ) and point to a large effect.

### Misfitting judges

To investigate the differences in conceptualisation between judges who performed averagely and judges who were shown to behave relatively different from the other judges (i.e. misfitting judges), the latter were identified by examination of the misfit statistics. Figure 1 plots the infit values of all judges ( $M = .87, SD = .19$ ). Applying the more stringent rule for misfit detection (mean  $\pm 1$  SD; Whitehouse & Pollitt, 2012) results in the identification of two misfitting judges (triangles in Figure 1). Judge G falls above the acceptable range (infit = 1.36), while Judge H falls below the acceptable range (infit = .59).

With regard to judge G, Mann-Whitney tests do not confirm the hypotheses that this judge differs in terms of the types of arguments used across all categories of argument ( $U = 84.5, z = -1.18, p = .598$ ) compared to the average non-misfitting judge. However, judge G ( $n = 22, M = 5.05, SD = 2.92$ ) provides, on average, more arguments per comparison than



**Figure 1.** Two misfitting judges ( $M$  infit = .87,  $SD$  infit = .19).

the average non-misfitting judge ( $n = 130$ ,  $M = 3.79$ ,  $SD = 2.65$ ). This difference is statistically significant ( $t(150) = -2.02$ ,  $p = .045$ ) and points at a medium effect ( $d = .452$ ). In contrast, judge H does significantly differ from the average non-misfitting judge in his/her use of the different types of arguments ( $U = 39$ ,  $z = 3.02$ ,  $p < .001$ ). This points to a small effect ( $r = .28$ ). Table 2 shows that judge H has focused strongly on analysis/synthesis and on style compared to most other judges. The difference in broadness and in average arguments per comparison did not render statistically significant different results ( $t(150) = -.632$ ,  $p = .528$ ,  $d = .09$ ) between judge H ( $n = 84$ ,  $M = 4.01$ ,  $SD = 2.19$ ) and the average non-misfitting judge ( $n = 130$ ,  $M = 3.79$ ,  $SD = 2.65$ ). Based on these results, it can be concluded that judge G only differs in terms of average arguments per comparison, and judge H only in focus.

## Discussion

Recently, comparative judgement (CJ) is been introduced as an alternative method for the scoring of essays. Although CJ has already shown promising results concerning its reliability, the validity of this method is up to the present time hardly underpinned by empirical research. This paper presents an explorative study into the validity of CJ to assess ‘academic writing’ in a pre-Master’s course at a Flemish university (Belgium). The holding of two critical assumptions underpinning the use of CJ for the assessment of writing is investigated: (1) its holistic character and (2) the meaning of a ‘shared consensus’ among judges. To assess the holding of these assumptions, the implications arising from both are examined in this study.

Firstly, the extent to which the final rank order of essays represents the whole of academic writing was investigated. Results indicate that almost 70% of the arguments given are directly related to the competence description. Furthermore, all dimensions of academic writing implied by the competence description are backed up with the arguments of the judges. This is a precondition for construct validity (Messick, 1989). This is not surprising because the judges were given the competence description at the beginning of the assessment. However, the prevalence of the different dimensions varies. Some aspects of academic writing, for example structure and analysis/synthesis, are considered more often by judges. Meanwhile, judges referred relatively infrequently to argumentation and to the quality of the discussion in the essays. Similar findings are presented in the studies of Huot (1993) and Wolfe and Kao (1996) on the criteria judges used to holistically score single essays. Another explanation for this finding is that novices in academic writing do not master the writing skills to adequately integrate argumentation and discussion in their essays. In that case, this study shows how CJ enables judges to differentiate between essays on characteristics rooted in the quality of the essays. This is an advantage over rubrics as the latter allows less flexibility in this regard and consequently lowers validity.

Secondly, about a quarter of the arguments given related to construct-relevant dimensions of academic writing are not defined within the competence description. Judges point, for example, to content aspects or to the style of essays when deciding on the winner of a comparison. This provides evidence that during the CJ process, judges use their expertise to make decisions (Jones et al., 2015). In the current study, the arguments not related to the competence description are, however, very common aspects within the writing domain (as for example ‘style’, see Cumming et al., 2002; Sakyi, 2000). This study shows that, according to the judges who participated in this study, style should be part of the competence

description in the first place. However, the extent to which CJ enables the use of expertise is probably related to the specificity of the competence description: a more specified competence description may leave less room for the use of expertise. Future research should examine this hypothesis.

Both the arguments related to the competence description and the arguments eliciting expertise are construct-relevant for the assessment of academic writing. This replicates the findings of the study of Whitehouse (2012) that concluded that judges' justifications for their choice between two geographical essays were in line with the competence assessed. Whitehouse (2012) pointed to the existence of a community of practice originating from the UK testing culture to explain this result. Within the current study, however, such a community of practice is lacking. Judges were researchers who had not received any training or did not share any experience regarding the assessment of academic writing. This suggests that CJ may also work in contexts without a community of practice.

One of the advantages of CJ, as claimed by its proponents, is its allowance and even appreciation of judges' differences in conceptualisation of what constitutes good academic writing. This study provides, for the first time, evidence that judges do differ in their use of expertise, and in focus and broadness of their judgements. Comparing judges' relative use of the three main categories of arguments indicates that although most judges gave about one-third of their arguments indicating their expertise, some judges seem less able to tap into their expertise. Judges also differ in the extent to which they use general arguments. Similar to what is found in the literature on rating (e.g. Eckes, 2008), this suggests the existence of 'judging profiles'. Within this study, it was, however, not possible to examine the existence of such profiles or explore their potential antecedents (e.g. characteristics of judges; judgement strategies) due to the small number of judges. Future research should include more judges to allow an exploration of judging profiles in CJ.

Judges also differ in their focus and broadness when deciding on the winner of a comparison. This study found that judges strongly differ in terms of the aspects of academic writing that they focus on. Looking at the arguments related to the competence description, most judges focused in the first place on the structure of the essays. But the second aspect paid attention to varied between judges. The same conclusion can be made for arguments only related to the competence. Every judge focused mainly on style. However, the second focus varied between judges. This is in line with results from the rating literature, which show that although judges may assign more or less similar scores to essays, they differ in the criteria they use to make these decisions (Gebril & Plakans, 2014; Lumley, 2002). A main source of these differences is the background of the judges (Pula & Huot, 1993). Within CJ, further research effort should be devoted to examining the impact of judges' characteristics on their decision-making.

In addition, the variation between judges in terms of broadness turns out to be significant. Judges strongly differ in terms of the number of arguments provided per comparison. It is, however, unclear how these results can be explained. Some judges may have a less broad conceptualisation of competence. Another possibility is that judges differed in approach towards the judgement task. Judges taking a 'real' comparative judgement approach might be more intuitive, and make quick judgements, which results in a focus on a limited set of aspects and renders fewer arguments per comparison than judges using a more analytic approach (e.g. assessing both essays separately before comparing them and arriving at a decision). Furthermore, the differences in focus and broadness might also be an artefact of the data collection method itself. Some judges might be less willing or able to specify their

reasons for picking an essay than others. Further studies should elaborate on these findings and examine the different explanations given.

Finally, this study explores the differences in conceptualisation between misfitting judges, deviating most from the shared consensus, and the other judges. Due to the small sample of (misfitting) judges, results are tentative. The misfitting judge who takes more decisions that deviate from the shared consensus (judge G) provides on average more arguments per comparison than the average non-misfitting judge. The other misfitting judge (judge H) makes fewer surprising decisions compared to the other judges. Judge H focuses strongly on a limited set of aspects. Again, this seems to suggest differences in judgement approach. Unfortunately, the data do not allow for further exploration of this hypothesis. Furthermore, misfit statistics need to be taken with caution because they are always relative, in comparison to the other judges (Whitehouse & Pollitt, 2012). This study is the first to connect misfit to the argumentation that judges provide for their decisions. Since differences in conceptualisation between judges are valued within CJ, judges having a rich conceptualisation of the competence to be assessed may be beneficial to the validity of the final rank order. Taking this perspective, judge G can be viewed as one of the most valuable judges within the current study. Consequently, labelling this judge as ‘misfit’ is highly questionable. Future studies should further explore this perspective on misfit as well as examine other statistical measures that are indicative of misfit.

As this study is among one of the first to explore the validity of CJ by challenging the holding of two of its critical assumptions, it cannot provide a conclusion on the general validity of CJ. Further research is needed to identify and underpin the validity claims made by the proponents of CJ. Besides, this study has some limitations. First, the small sample of judges does not allow extensive investigation of the differences and similarities among judges’ focus and broadness. However, this study shows that more insight into differences among judges is needed in order to be able to set up valid assessment procedures. The small sample also makes it impossible to generalise the results. Second, the conclusions are drawn based upon the written justifications of the judges. This leads to problems, as it is for example shown that a small percentage of judges’ arguments relates to the general quality of the essays. Establishing the relationship of these arguments to the competence assessed is impossible. This is problematic, as the extent to which judges’ arguments reflect construct-relevant aspects is a critical requirement to underpin the construct validity of CJ (Messick, 1989). It is unclear whether this is caused by characteristics of the comparison (e.g. difficulty), by the holistic character of the judgements or by the way qualitative data were collected. This implies problems concerning the distinction between what judges say they judged and what they really took into consideration. Future studies should use methods such as eye-tracking and think-aloud to replicate, complement and elaborate on this study.

## Conclusion

In this study, a first effort is made to underpin the validity of comparative judgement (CJ). The implications arising from two critical assumptions underpinning the validity of CJ are examined. This study is set up within a pre-Master’s course on academic writing at a Belgian university.

Firstly, examination of judges’ arguments that justify their decisions points out that the rank order of essays generated by CJ represents the whole of academic writing. Full construct



representation is a precondition for claiming construct validity (Messick, 1989). Secondly, as judges also provided construct-relevant arguments unrelated to the competence description, this evidences that CJ enables judges to use their expertise while judging. Furthermore, judges were found to vary in their focus, broadness and use of expertise while judging. This underpins, for the first time, the claim made by CJ's proponents that CJ allows differences in conceptualisation between judges. Finally, it was examined whether judges labelled as 'misfit' have a divergent conceptualisation regarding academic writing. Indications were found that this might be to a certain extent the case.

In sum, this study adds to the CJ literature by providing evidence that the method is not only able to generate reliable scores, but also provides valid scores with regard to academic writing, even when a community of assessment practice is lacking. Since the use of CJ in the assessment domain is growing, more validation studies are necessary, and the findings of this study need to be replicated and elaborated on in the future.

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