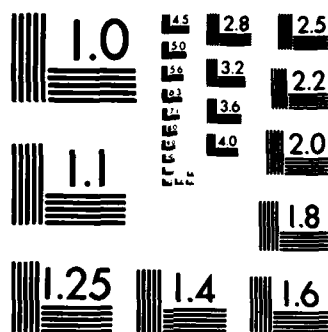END
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Job Knowledge, Ratee Familarity,

Conceptual Similarity, and Halo Error:

An Exploration

Steve W.J. Kozlowski   Michael P. Kirsch

Michigan State University

and

Georgia T. Chao

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Michigan State University
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The results of numerous social perception studies have led researchers to conclude that raters' implicit cognitive schemes regarding trait and behavior covariance may play a crucial role in the rating judgment process. Cooper (1981a, 1981b) proposed one such cognitive scheme, semantic conceptual similarity, as a key source of halo error in job performance ratings, but was unable to reproduce the results of previous social perception research (e.g., Shweder, 1975). This study employed baseball players as target ratees to examine the effects of job

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and ratee knowledge on the relationships of raters' conceptual similarity schemes with rating and true score covariance. The results were consistent with the systematic distortion hypothesis (Shweder, 1975): The association between conceptual similarity and rating covariance was significantly greater when raters lacked sufficient job and/or ratee knowledge. Moreover, the degree of halo was also significantly greater when raters lacked relevant job and ratee knowledge. The potential advantages of using objective measures of actual performance as true score estimates in the study of rater cognitive processes, as opposed to the widely used videotape simulations, are discussed.

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Job Knowledge, Ratee Familiarity,

Conceptual Similarity, and Halo Error:

An Exploration

Halo error (Thorndike, 1920), or illusory correlation
(Bingham, 1939), has been regarded as a particularly
pervasive form of inadvertent rater judgment bias (Borman,
1977; Cooper, 1981b). Early investigators of trait and
performance judgments discovered that rating dimension
intercorrelations tended to be higher than the presumed
independence of the dimensions led them to expect (cf.
Rugg, 1922; Thorndike, 1920; Wells, 1907). Bingham (1939)
distinguished between "true" and "illusory" halo, noting
that jobs require the use of shared abilities across
performance dimensions. Thus, some dimensional
intercorrelation is inevitable, with the degree of halo
error hinging on the extent to which rating
intercorrelations exceed the corresponding true score
intercorrelations.

Conceptualizations of the nature of halo error have
been remarkably consistent. Thorndike characterized halo
as the tendency by a rater to "think of the person in
general as rather good or rather inferior and to color the
judgment of the separate qualities by this general
feeling" (1920, p. 25). It was argued that the recall of
information for ratings would be affected by this general

impression. Raters would tend to overestimate the ratee on other dimensions seen as consistent with the general impression, thereby inflating the intercorrelations. Newcomb (1931) discovered that retrospective ratings of personality traits were more highly intercorrelated than direct observational evidence provided by the same raters indicated was warranted. Newcomb suggested that the inflated intercorrelations were due to the raters' implicit covariance assumptions, that is, the "logical presuppositions in the minds of the raters rather than from actual behavior" (1931, p. 288). These two perspectives of halo differ somewhat on the nature of the hypothesized source of bias, but imply a similar process.

The conventional view has held that halo is particularly sensitive to the raters' familiarity or knowledge of the ratee and the ratee's job, with halo more likely under conditions in which raters lack performance-relevant knowledge. The arguments and evidence for this assertion are largely a deduction from measurement theory. For example, a number of studies have reported positive relationships between rater knowledge of the ratee and rating scale reliability and validity (cf. Ferguson, 1949; Hollander, 1954, 1957; Kornhauser, 1926). The assumption has been that improvements in reliability and validity associated with increased rater knowledge are

also associated with corresponding reductions in all forms of error bias including halo. There have been few direct empirical tests which actually evaluated this hypothesis vis a vis halo. Studies by Brown (1968) and Koltuv (1962), however, reported that rating dimension intercorrelations were lower for raters indicating greater familiarity with the ratee.

At a general level, the process implications have been that global impressions or pre-existing cognitive schemata are more likely to be sources of performance judgments when the rater lacks performance-relevant information (Borman, 1974; Cooper, 1981a, 1981b; DeCotiis, 1977; Freeberg, 1969; Thorndike & Hagen, 1961; Wherry, · 1952).

Cooper (1981a, 1981b) has offered a more richly articulated process hypothesis. It draws upon the work of Shweder (1975, 1980) and D'Andrade (1974) who asserted that the conceptual similarities among rating dimension labels were the source of implicit rater covariance schemata. In other words, raters err by mistaking semantic category resemblance for behavioral covariance (Tversky & Kahneman, 1974). By equating this view with Newcomb's (1931) suggestion that inflated rating intercorrelations resulted from raters' implicit conceptual schemes, Cooper (1981b) proposed conceptual

similarity as a prevalent source of halo error in performance ratings. This is thought especially to be the case when ratings are obtained under "difficult memory conditions" (Shweder, 1980, p. 75)--where raters lack job knowledge, knowledge of the ratee, and/or opportunities for information decay increase. Judgments made during recall will be systematically biased in the direction of the pre-existing conceptual scheme, resulting in halo error. It should be noted that Cooper (1981a) has interpreted this process to mean that ratings on conceptually similar categories will covary at a higher level than ratings on dimensions that are perceived as less similar, not that conceptually similar dimensions will receive the same rating (cf. Lamiell, Foss, & Cavenee, 1980; Shweder, 1980).

Some support for what has been termed the 'systematic distortion hypothesis' has been provided by a series of studies. Using ratings of personality traits, these studies have shown that raters' conceptual similarity judgments were more strongly associated with rating and true score covariance, than rating covariance was with true score covariance (cf. D'Andrade & Shweder, 1980; Shweder, 1975). Thus, raters were concluded to be more sensitive to conceptual similarity than to actual behavioral covariation in making their judgments. Berman

& Kenny (1976) also reported that trait similarity judgments provided by raters were associated with rating intercorrelations.

Cooper (1981a) applied these notions to the area of performance appraisal, exploring the relationship of blind raters' conceptual similarity covariance judgments with behavior-based performance ratings and true scores. He reported that the conceptual similarity judgments were reasonable predictors of previously observed rating intercorelations for three different jobs (r's = .92, .57, and .57). However, when compared with rating and true score intercorrelations obtained from Borman (1977), the hypothesis was not supported. Rating covariance was more strongly associated with true score covariance (r = .89) than with conceptual similarity judgments (r = .55). As Cooper (1981a) correctly noted, the study did not adequately address the systematic distortion hypothesis because there was no difficult memory condition. Ratings had been obtained immediately after raters viewed a videotaped performance segment. Thus, the raters were all equally knowledgeable concerning the ratee's job and level of performance, and no opportunity for memory decay was apparent. Moreover, the relationship of conceptual similarity to halo error was never demonstrated.

In addition to this operational problem, there was an

additional limitation. The Achilles Heel of performance rating research has been the difficulty of generating estimates of true scores against which ratings can be evaluated. The videotape stimuli methodology developed by Borman (1977) was a major advance in this respect. However, this method does possess a number of limitations that make its applicability problematic with respect to the systematic distortion hypothesis. For example, it is questionable whether the raters, typically college students, are knowledgeable about the job performance they attempt to characterize. The performance sequences they observe are generally very brief in duration (5 to 11 minutes), as opposed to more realistic observational periods spanning several months. Their attention is highly focused during the observation sequence both by the experimental task demands, as well as by the selective nature of the camera as observer--unlike more realistic observational situations where many stimuli compete for attention. Thus, in its present state of development, this method appears to lack ecological validity.

In order to address these limitations, this study used baseball players as target ratees. This provided a naturally occurring performance domain which unfolded over a lengthy time period (approximately 6 months) and allowed for different levels of rater job knowledge and knowledge

of the ratee, thus more adequately simulating a realistic rating task. More importantly, however, the performance domain provided objective measures which could be employed as true score estimates. Although such measures cannot be regarded as true scores in the strict psychometric sense because some error of measurement is present, they are superior to the true scores derived from the videotape methodology for this particular study. The true score estimates used in the videotape method are derived from pooled rater judgments. Thus, if conceptual similarity, or some other cognitive scheme, is consistently used by raters, that scheme will be reflected in the pooled judgments and the true score estimates. The use of independent measures would eliminate this potential confound.

The present study represents an effort to reexamine the applicability of the systematic distortion hypothesis to the domain of performance ratings and its effect on rater halo. Specifically, conceptual similarity judgments are hypothesized to be more strongly associated with rating covariance and rating covariance less strongly associated with true score covariance when raters lack job and/or ratee knowledge. In addition, it is anticipated that halo will be greater under these low knowledge conditions.

Method

Subjects

Raters were drawn from the introductory psychology courses of a large mid-western university. Their participation was voluntary and they received a nominal amount of credit toward their grade. Altogether, 192 students participated in the research with 186 providing useful responses.

Procedure

Performance dimensions. The categories of baseball player performance were limited to measures of offensive behavior. The seven dimensions that were assessed included the following: batting average, home runs, extra-base-hits, runs scored, strike outs, stolen bases, and runs created1. Objective measures of these indices for the 1983 baseball season were obtained directly from the official major league sources for the ratees in the study2.

Conceptual similarity judgments. In order to assess the raters' pre-existing conceptual similarity schemes, subjects were asked to judge the degree of similarity for all the possible pairings of the seven performance dimensions. Instructions were provided which explained the concept of similarity and provided examples. In addition, definitions of the performance dimensions were

also included to ensure that all raters had a common basis for the judgements. The ratings were made using a scale ranging from 0 to 100 percent similar. This procedure resulted in 21 conceptual similarity ratings [7 (7 - 1) / 2].

Knowledge conditions. The systematic distortion hypothesis specifically states that there must be a delay between behavioral observation and recall for the conceptual similarity scheme to bias the recalled observations. This requirement was built into the rating task by gathering the ratings at the end of the 1983 baseball season. Thus, the performance ratings were based on behavior accumulated over a six month period. It was hypothesized that the conceptual scheme would exhibit a greater association with rating covariation where the rater had poor job knowledge and/or lacked performance-relevant ratee information. These two knowledge conditions were established in the following manner.

First, a job knowledge condition was created by having the raters indicate the extent to which they were active observers of the sport. Ratings were made on a seven-point scale with the following anchors: 1=not very knowledgeable--I seldom or never read about or watch baseball; 4=somewhat knowledgeable--I sometimes follow the

sport in newspapers and watch it on TV; and, 7=extremely knowledgeable--I follow the sport in the newspaper and watch it on TV regularly. The job knowledge responses were normally distributed and ranged over the entire scale. The job knowledge condition was created by dichotomizing responses on the rating of baseball knowledge, defining responses four and below as low job knowledge (n=90) and those greater than four as high job knowledge (n=96).

Second, a ratee familiarity condition was established. This condition was difficult to define a priori. Therefore, raters were provided with a list of 30 major league players/ratees selected to cover a range of possible rater exposure to the players. Raters were instructed to select two players from the list: one known very well and one whom they knew little about. The wide range of visibility of the players/ratees was to ensure. that low job knowledge raters could identify ratees they knew about and high job knowledge raters could find ratees they knew little about. As a validity check, raters also indicated the extent of their familiarity with each ratee they selected on a seven point scale. The familiarity rating difference between well known and little known ratees was significant (t = 18.56, p < .001), thereby verifying the manipulation.

Ratings and true scores. Raters selected their ratees as instructed and provided ratings on the seven performance dimensions using seven-point rating scales. The appropriate ratee's objective performance measures were attached to each set of ratings.

Results

The design for the study incorporated two knowledge factors, job and ratee, each with two levels. To address the systematic distortion hypothesis, intercorrelation matrices for the ratings and true scores were generated for the four cells. One-half of each of the matrices, excluding the diagonal, was transformed to z scores (Edwards, 1954) and arrayed as vectors corresponding to the conceptual similarity judgments. Intermatrix correlations were computed among the intercorrelation vectors and raters' mean conceptual similarity judgments. The intermatrix correlations are displayed in Table 1.

Insert Table 1 about here

The results indicated that the conceptual similarity-rating covariance relationship was significantly different for the high and low job knowledge conditions (z = 1.93, p < .05, one-tailed, Cohen & Cohen, 1983) when rating a well-known ratee, as predicted. High

job knowledge raters' conceptual similarity schemes showed little association with rating covariance (r = .21), while low job knowledge raters' conceptual similarity schemes were strongly associated with rating covariance (r = .72). Moreover, the rating-true score covariance association was higher than the conceptual similarity-rating covariance association for high job knowledge raters, while the reverse was true for the low job knowledge condition.

Looking across the ratee knowledge condition, there was a small but nonsignificant decline in the conceptual similarity-rating covariance association for low job knowledge raters. Thus, it would appear that raters lacking job knowledge tended to rely on their pre-existing conceptual schemes in making ratings, regardless of how well they knew the ratee. There was, however, a substantial effect for high job knowledge raters. The degree of conceptual similarity-rating covariance association jumped from r = .21 to r = .82 (t = 3.20, p < .01, one-tailed; see Cohen & Cohen, 1983) when they rated players not well-known to them. Moreover, that association exceeded the rating-true score covariance relationship as predicted by the systematic distortion hypothesis. These findings replicate the results reported by Shweder (1975) and indicate that pre-existing conceptual similarity schemes are strongly associated with

rating covariance when raters lack job knowledge and/or are unfamiliar with the ratee's performance. It should be noted, however, that the results do not clearly indicate that conceptual similarity serves as a template for the observed rating covariance.

Conventional wisdom holds that halo will be greater under low job or ratee knowledge conditions. To evaluate the effects of job and ratee knowledge on halo, ratings were standardized for the total sample and the raters' standard deviation across the rating dimensions was computed as an index of rating halo. Ratings were standardized in order to eliminate the effect of rating dimension mean differences on the halo index (Pulakos & Schmitt, 1984). Means and standard deviations of the halo measure are displayed in Table 2.

Insert Table 2 about here

The measure was subjected to a repeated measures analysis of variance. Homogeneity of variance assumptions were met (Box $\underline{M}$ = 6.83, $\underline{X}^2$ = 6.75, n.s.). Results of the analysis revealed significant main effects for job knowledge ($\underline{F}$ (1,84) = 7.34, $\underline{p}$ < .05), and ratee knowledge ($\underline{F}$ (1,84) = 4.40, $\underline{p}$ < .05), while the interaction was not significant ($\underline{F}$ (1,84) = .13, n.s.). The effect is clearly

indicated by the means reported in Table 2. Halo is greater under both low knowledge conditions, as predicted.

Although the results link halo to situations in which raters lack performance-relevant job and ratee information, the specific role of conceptual similarity as the major source of halo (cf. Cooper, 1981a) remains to be demonstrated.

Finally, in order to address the conventional wisdom concerning the relationship of job and ratee knowledge and rating reliability and validity, reliability and validity analyses were undertaken. The determination of rating reliability for all the cells in the design was problematic because ratees were not common across raters. However, average reliabilities collapsed over knowledge of baseball indicated greater interrater agreement for well-known ratees (r = .96) than for little known ratees (r = .62), as would be expected. Moreover, raters who reported greater knowledge of baseball were somewhat more reliable (r = .93) than less knowledgeable raters (r = .81) when rating a well-known ratee. Other estimates were impossible to ascertain.

Validity coefficients (correlations of the ratings with the objective performance measures) are displayed in Table 3.

Insert Table 3 about here

These results clearly indicate that job knowledge was
an important factor for valid ratings. Raters with low
knowledge of baseball were unable to predict *performance*
regardless of how familiar they were with the ratee. The
results for high job knowledge raters show that ratee
familiarity also affected the validity of the ratings.
Ratings were better predictors when well-known players
were rated.

Discussion

The results of this study provide support for the
notion that conceptual similarity is more strongly
associated with rating covariation under conditions of low
job and ratee performance-relevant information. It also
supports the commonly held belief that
performance-relevant knowledge and halo negatively covary.
Cooper's (1981a) contention that conceptual similarity is
a source of halo was not contradicted, although no direct
support was evident. These results reiterate the current
focus on rater job knowledge and ratee observation
(familiarity) as features critical to understanding the
rating process.

A second important outcome of this research was the

success of using sports figures, where objective
performance measures are available, as target stimuli in
rating research. This method has the potential to provide
realistic performance rating simulations without many of
the limitations associated with the current videotape
methodology. It is hoped that this study will stimulate
further research of this nature.

Finally, there were several issues which arose in
this research which should be addressed. Although raters
provided their own conceptual similarity schemes, unlike
previous research which used blind raters to provide such
ratings (cf. Cooper, 1981a; Shweder, 1975), the
relationship of conceptual similarity to rating covariance
was limited to a group level analysis. That is, it was
not possible to assess the effect of individual-level
conceptual similarity on individual rating covariance,
since raters rated only one player under each ratee
knowledge condition. Thus, it is possible that the
group-level analysis overstates the extent to which
conceptual similarity is associated with individual-level
rating covariance (James, 1982). Having only one rating
per subject in a given knowledge condition also precluded
an opportunity to determine whether individual-level
conceptual similarity was indeed a source of
individual-level illusory halo as suggested by Cooper

(1981a). This could be rectified in future research by having all raters rate a larger number (e.g., n=10) of the same ratees. It would then be possible to directly estimate illusory halo at the level of the individual rater by comparing the degree of rating intercorrelation with the intercorrelation of the true score estimates, and to explore the relationship of conceptual similarity or some other cognitive organizational scheme to illusory halo.

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Author Notes

Footnotes

[1]Runs Created (RC) is an index of the player's ability to increase his team's score through all the elements of his batting record.   It was computed by:

$$RC = \frac{(Hits + Walks)\ (Total\ Bases)}{(At\ bats + Walks)} \ ;$$

see James (1982).

[2]The official sources were: Sports Information Center, Boston, MA (American League) and Elias Sports Bureau, New York, NY (National League).

Table 1

Relationship of Conceptual Similarity (CS) with Rating (R) and

True Score (TS) Covariance

Baseball Knowledge	Ratee Knowledge					
	High			Low		
	CS-R	CS-TS	R-TS	CS-R	CS-TS	R-TS
High	$.21^a$			$.82^b$		
		.52			.43	
			.61			.33
Low	$.72^b$			.66		
		.56			.37	
			.54			.26

Note. Different superscripts within a row or column indicate

significantly different (p < .05, one-tailed) correlations.

Table 2

Cell Means and Standard Deviations for Halo Measure

Baseball	Ratee Knowledge			
	High		Low	
Knowledge	M	SD	M	SD
High	.840	.263	.757	.284
Low	.795	.340	.693	.275

Note. Smaller mean values are indicative of greater degrees of halo.

Table 3

Validity Coefficients for the Ratings Predicting Objective

Performance Scores

Performance Dimensions	Baseball Knowledge			
	High		Low	
	Ratee Knowledge		Ratee Knowledge	
	High	Low	High	Low
Batting Average	44	-23	02	01
Home Runs	56	38	20	02
Extra Base Hits	31	17	03	03
Runs	11	08	09	-02
Strike Outs	16	04	-09	28
Stolen Bases	07	30	00	04
Runs Created	22	26	07	02
Mean Validity	28	14	05	06

Note. Mean validity represents the average of the dimensional

coefficients using an r to z to r transformation. Decimals omitted.

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