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Source: *Social Psychology Quarterly*, Vol. 58, No. 1 (Mar., 1995), pp. 13-30  
Published by: American Sociological Association  
Stable URL: <http://www.jstor.org/stable/2787140>  
Accessed: 21/01/2010 16:34

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## Seniority-Based Reward Allocation in the United States and Taiwan\*

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*Despite the apparent pervasiveness of seniority as a basis for distributing group rewards, this variable has been relatively neglected by social scientists interested in allocation processes. Three experiments conducted in the United States and Taiwan examined the allocation of group rewards to individuals differing in seniority level, social-emotional competence, and task competence. The results demonstrated that in addition to merit—greater rewards being distributed to individuals with superior task competence and social competence—seniority level was a robust determinant of reward allocation. The results supported the proposition that seniority influences allocations in part because of the assumed covariation of seniority with competence, and revealed evidence of culture-specific values. Seniority, however, was a relatively pervasive determinant of allocation behavior among both American and Chinese allocators, regardless of recipients' social competence, task competence, and sex. Thus seniority appears to be quite a general normative basis for reward allocation.*

Most social systems develop formal and informal rules to govern the allocation of rewards and resources among group members. The origins of many allocation rules can be identified in the group problems for which they provide solutions. For example, allocation norms often serve to minimize conflict among group members, to maximize members' productivity, or to enhance stable group membership (e.g., Deutsch 1975; Freedman and Montanari 1980; Greenberg and Cohen 1982; Rusbult et al. 1988; Walster, Berscheid, and Walster 1976). Thus it is not surprising that groups frequently adhere to norms such as equity, equality, or need, and that benefits frequently are distributed among group members on the basis of their contributions to the group's instrumental or social-emotional goals (see Freedman 1978; Podsakoff 1982).

Yet although social scientists have studied allocation processes for well over three decades, and although philosophers have discussed issues of fairness and justice since time immemorial (see Cohen and Greenberg 1982; McClintock and Keil 1982), we know

little about the role of *seniority level* as a basis for reward allocation. Is the duration of time over which a group member has contributed to group goals an important consideration in shaping allocation behavior? If so, how and why do such effects obtain? The literature on allocation processes does not adequately answer such questions—an especially noteworthy omission in light of the apparent prevalence of seniority-based reward distribution in everyday life.

The present research investigates the manner in which members' seniority influences reward allocation in formal groups; it explores two key explanations of this tendency. First, to determine whether seniority-based reward distribution emerges as a consequence of the assumed covariation of seniority with member competence, we examined allocations to group members who differed in both task competence and social competence. In addition, to evaluate the degree to which seniority is a culture-specific value, we conducted our research in both the United States and Taiwan.

### *Previous Research on Seniority in Reward Allocation*

Despite the seeming neglect of the seniority variable in the justice literature, we were sensitized to the potential importance of this

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allocation criterion by research on the emergence of leadership in open groups (Insko et al. 1980, 1982, 1983). In four separate experiments, subjects were assigned to one of several work groups; each of these produced goods and traded their goods with other groups. Over time, "older" members of groups retired and new members replaced them. All four experiments revealed tendencies toward seniority-based selection of leaders. Also, when rewards were not equally divisible among group members, additional profits were allocated on the basis of seniority.

Beyond these experiments, however, little social psychological research has examined seniority as a normative consideration in group allocations. In a study relevant to this point, Reis (1984) explored the variety of norms that may form the basis for group allocations, and identified 17 distinct justice rules. These rules were identified not only from a variety of social science literatures but also from historical, philosophical, and legal sources. Although this list included diverse allocation rules such as proportionality, placing the good of the group over the good of the individual, and doing good for its own sake, it is striking that seniority was not included. We conducted a search of the literatures in psychology, sociology, and organizational behavior to identify recent work on seniority. The search phrase "seniority and justice" yielded only two relevant citations. Lansberg (1988) presented a theory of organizational justice based on social comparison with two categories of referent: own category (referent similar to self) and other category (referent dissimilar to self). He identified seniority as relevant to both forms of comparison (e.g., junior faculty, senior faculty). Also, Suppes (1977:233) discussed productivity and seniority as justifications for income inequality, placing particular emphasis on seniority "because of its neglect in the normative literature of economics and philosophy."

Although seniority has been relatively neglected by social scientists interested in justice issues, our search yielded more material in a review of research on compensation processes. For example, positive correlations between seniority and salary have been observed for organizational managers, university personnel, and professional athletes (Danziger 1982; Dworkin and Park 1986; Kopelman and Schneller 1987; Nathan,

Lubin, and Matarazzo 1981). Seniority also has been shown to be correlated with outcomes other than salary, such as promotion rules, length of vacation, and the resolution of employees' grievances (Green and Potepan 1988; Ingram and Bellenger 1983; Leap and Stahl 1985; Schnell 1987). In addition, the link between seniority and compensation is moderated by variables such as employees' level and unionization (Barbezat 1989; Ronan and Organt 1973).

In light of our interest in examining the cross-cultural strength of seniority rules, we were particularly interested in studies of seniority-based allocation in Eastern cultures. Empirical studies of allocation behavior in the United States and in Japan have suggested fairly consistently that the tendency toward seniority-based compensation is stronger in Japan (Bowman 1986; Exall 1985; Lincoln 1989). Some authors, however, believe that this practice may be changing (Mroczkowski and Hanaoka 1989), and that in any event, the tendency toward seniority-based allocation does not apply to temporary workers, who constitute the majority of the Japanese workforce (Baer 1987).

#### *How and Why Might Seniority Affect Reward Allocation?*

On the assumption that senior group members indeed receive greater-than-average allocations of group rewards and resources, it is important to ask *why* this might be so. In the present work, we take preliminary steps toward examining two possible explanations. One explanation suggests that seniority-based allocation represents, to some extent, *second-order merit-based reward*. Specifically, it is possible 1) that senior group members exhibit greater *task competence*, or 2) that allocators and other group members assume that seniority implies task competence. For many sorts of task-relevant behavior, experience and practice in fact yield superior performance. Thus, senior group members may receive larger rewards because they are believed to contribute greater inputs toward the group's instrumental goals; in direct or subtle ways, senior members' task inputs may be perceived as greater in quantity or quality.

In parallel fashion, it is possible 1) that senior group members possess greater *social-emotional competence*, or 2) that allocators and other group members assume that senior-

ity implies social competence. It would not be surprising if experience with the social-emotional complexities of group functioning were to yield enhanced social sensitivity or savvy. Among university faculty members, for example, greater experience in socializing graduate students, dealing with complex collegial relations, and negotiating the rapids of university politics may produce greater social-emotional wisdom. Thus, senior group members may receive larger rewards in part because they are believed to contribute greater inputs toward the group's social-emotional goals; in direct or subtle ways, senior members may be perceived to smooth group conflicts and to enhance group morale.

The extant research demonstrates clearly that variations in task competence influence allocations: individuals with greater instrumental inputs receive greater portions of the group's rewards (e.g., Ilgen, Mitchell, and Fredrickson 1981; Leventhal and Michaels 1969; Rusbult et al. 1990; Tindale and Davis 1985). Also, although the literature on social competence and reward allocation is limited, the available evidence indirectly supports the claim that individuals with greater social-emotional inputs receive greater rewards (e.g., Erickson et al. 1978; Lin, Insko, and Rusbult 1991; Sypher and Zorn 1986). Given that members with greater task and social competence typically receive greater rewards—and on the assumption that senior group members may be thought to possess greater task and social competence—it is possible that senior group members receive greater rewards in part because of the assumed covariation of seniority with task or social competence. If this line of reasoning has merit, the tendency to base allocations on seniority level should be plausible primarily when a group member exhibits competence of one or both sorts. When an employee exhibits some degree of competence, the allocator has the wherewithal to form further inferences on the basis of the employee's seniority level. Under conditions of low task or social competence, however, the presumed covariation of seniority with competence is “denied,” and seniority effects should be attenuated.

A second explanation of seniority-based allocation centers on *culture-specific values*. Specifically, it has been argued that Eastern cultures place greater emphasis on social role relations than do Western cultures (Bond

1988; Bond and Hwang 1986; Hsu 1981; Hwang 1987; Leung and Bond 1984): “Persons are regarded as inherently part of the social body, with relationships of hierarchical interdependence assumed to be both natural and normatively desirable” (Miller 1991:21). In light of the emphasis on respecting one's elders and honoring experience-based wisdom, this collectivistic orientation should yield marked tendencies toward seniority-based allocation. In contrast, the individualism of Western cultures may yield tendencies to relegate role relations to a lesser position, regarding benevolent behavior in such relationships as voluntary, conditional, and not legitimately subject to social regulation (Bellah et al. 1985; Hofstede 1980; Miller 1991). Accordingly, in Western cultures, self-interest and individual well-being may be accorded higher status, and social obligations may have lower status. Operating from this individualistic orientation should yield greater tendencies toward merit-based allocation and lesser tendencies toward allocation based on social position (i.e., weaker adherence to seniority norms).

#### *Overview of the Current Research*

In this paper we report the results of three experiments in which Chinese and American allocators distributed group rewards to employees who differed in *seniority level* (Exps. 1 and 2), *social-emotional competence* (Exps. 1 and 3), and *task competence* (Exps. 1 and 3). Before conducting this research, we held the general expectation that seniority would exert relatively robust effects on allocation behavior. At the same time, we designed our research in such a way as to examine the two above-mentioned key explanations of seniority effects.

The “second-order merit” explanation suggests that if seniority level interacts with task or social competence—yielding differential allocations primarily under conditions of high task or social competence—it is plausible that seniority effects are partial artifacts of the assumed covariation of seniority with task or social competence. Given some degree of employee competence, it becomes possible to infer further competence on the basis of seniority level. In contrast, given low task or social competence—when the possible seniority implications for competence are contradicted—seniority effects should be attenuated

or eliminated. That is, when assumptions regarding the covariation of competence with seniority are inconsistent, seniority-based reward allocation should be less pronounced.<sup>1</sup>

The "culture-specific value" explanation suggests that if differential allocation on the basis of seniority is stronger among Chinese subjects than among their American counterparts, the evidence for culture-specific seniority norms becomes more plausible. In contrast, if seniority effects are relatively robust and general—if interactions with allocator culture, member task competence, and member social competence are weak or nonexistent—then seniority properly should be regarded as a unique, independent basis for allocation behavior in its own right.

To explore the robustness of seniority effects, we asked subjects to distribute two types of group reward—salary allocations and promotion recommendations. We expected that allocation behavior would be similar for these two types of reward. Also, although we advanced no a priori hypotheses regarding either allocator sex (see Kahn et al. 1980; Watts, Messé, and Vallacher 1982) or employee sex (see Major and Deaux 1982; Taynor and Deaux 1973), to assess the generalizability of our findings, all three experiments examined the effects of allocator sex, and two of the three experiments (Exps. 2 and 3) examined the effects of employee sex.

## METHODS

### *Subjects*

Subjects participated in one of three experiments in partial fulfillment of the requirements for introductory psychology courses at either the University of North

Carolina or the National Taiwan University. One hundred and eight subjects participated in Experiment 1: 65 Americans (31 men, 34 women) and 43 Chinese (22 men, 21 women); 109 subjects participated in Experiment 2: 62 Americans (27 men, 35 women) and 47 Chinese (19 men, 28 women); and 116 subjects participated in Experiment 3: 57 Americans (30 men, 27 women) and 59 Chinese (22 men, 37 women). Subjects were 19 to 20 years old on average (among Americans and Chinese, respective *M*s = 19.07 and 20.35), and most were freshmen or sophomores (among Americans and Chinese, 19% and 52% respectively were freshmen, 63% and 37% were sophomores, 13% and 7% were juniors, and 5% and 3% were seniors).

### *Design*

All three experiments included two between-subjects variables: allocator culture (American vs. Chinese) and allocator sex (male vs. female). Each experiment effected within-subject manipulations of several employee characteristics. Experiment 1 included three within-subject variables: employee seniority (high vs. low), employee social competence (high vs. low), and employee task competence (high vs. low). To examine possible interactions of seniority with employee sex, Experiment 2 included two within-subject variables: employee seniority and employee sex (male vs. female). To examine possible interactions of social competence and task competence with employee sex, Experiment 3 manipulated social competence and task competence along with employee sex.

### *Procedure*

Subjects read essays describing a software development company that produced both mainframe and personal computers, and were asked to place themselves in the role of K, manager of the product development division. Essays explained that the company president evaluated K's performance on the basis of division morale and performance level; indeed, these were said to match K's personal goals as manager. Thus K wished to hire good employees, to keep them satisfied and motivated, to retain strong employees, and to develop an effective support staff. It was time for the annual performance evaluation of

<sup>1</sup> The assumption that low task or social competence should reduce the impact of manipulated seniority when seniority itself is based on assumed high competence is consistent with people's failure to adequately process disconfirming or negative information. An abundance of evidence demonstrates that individuals think more readily in terms of positive-confirming-promotive instances than in terms of negative-disconfirming-preventive instances. This tendency initially was identified by Hovland (1951) and Hovland and Weiss (1953), but more recently has been documented empirically by McGuire and McGuire (1991). In the present research, the only instance in which the positive competence implications of seniority are not contradicted by negative information is when both competence and seniority are high.

eight employees in K's division (in Exp. 2, four rather than eight employees were evaluated). Evaluations were to be completed in private, and employees would not know what evaluations other employees had received. Subjects were asked to allocate salary increases to each employee and to indicate how strongly they would recommend each employee for a promotion.

Employees differed along several dimensions. *Employee seniority* was manipulated through variations in job tenure: for example, "D has been working in the company for about 19 years, a very long time" versus "S has not been a company member for long; he took the job 10 months ago." *Social competence* was manipulated through variations in employee pleasantness and social skill: for example, "F is a really loyal employee whose devotion and optimism are contagious; his contributions to group morale are very important" versus "T is a short-tempered, irritable employee; when he's working on a group project, the group invariably experiences conflict, tension, and unhappiness." *Task competence* was manipulated through variations in employee performance: for example, "P is a superb programmer because his knowledge is up-to-date—he's very good at keeping up with the fast-changing technology of computer science" versus "L is a sloppy and inefficient programmer, prone to develop careless programs that require numerous costly hours of debugging." In Experiment 1, all employees were male. In Experiments 2 and 3, *employee sex* was manipulated: for example, "Ms. M is a really talented programmer who is noted for her creativity at developing unique programming algorithms. She is a very pessimistic, negative sort of person who depresses other group members and harms group cohesiveness."

Before developing employee descriptions, we pretested 24 statements regarding employee social competence and 24 statements regarding employee task competence. Twenty-seven subjects at the University of North Carolina (12 men, 15 women) provided pretest ratings, indicating the degree to which each statement on social competence described an employee who was socially skilled (0 = terrible social skills, 8 = excellent social skills) and to which each statement on task competence described an employee who was competent at his or her job (0 = not at all competent, 8 = extremely competent). Social

competence statements were rated independent of task competence statements. We selected four statements for each level of each variable: four descriptions of high social competence ( $M = 7.23$ ,  $SD = 0.77$ ), four descriptions of low social competence ( $M = 1.04$ ,  $SD = 1.02$ ), four descriptions of high task competence ( $M = 7.17$ ,  $SD = 0.77$ ), and four descriptions of low task competence ( $M = 1.57$ ,  $SD = 1.25$ ). We also created descriptions of four employees with tenures ranging from 16 to 18 years (high seniority) and four employees with tenures ranging from a few months to about a year (low seniority). (We did not pretest employee seniority statements because these statements were based on objective manipulations of employee job tenure.)

In Experiment 1, we created a composite employee by randomly selecting a high seniority statement, a high social competence statement, and a high task competence statement. Without replacing statements, we created the next employee: high seniority, high social competence, and low task competence. Once we had developed eight employee descriptions (i.e., the full  $2 \times 2 \times 2$  design), we ordered the descriptions randomly. We used parallel procedures to create composite employees for Experiment 2 (four employees differing in seniority and sex) and Experiment 3 (eight employees differing in social competence, task competence, and sex).

Instructions and experimental materials were written in the subjects' native language. The original English materials were translated into Chinese by the third author, and the Chinese version then was translated back into English by another bilingual graduate student in social psychology (see Lin et al. 1991). We made some changes in both versions to achieve equivalence of meaning between the two forms.

### *Dependent Measures*

Allocation behavior was measured as "part of the company's annual evaluation system"—a system that included both salary allocations and evaluations of each employee's potential as a manager. To measure *salary allocations*, we asked subjects to divide 100 points among employees, indicating the percentage of the available salary funds that each employee should receive (i.e.,

total allocations across employees summed to 100). To measure *promotion recommendations*, we asked subjects to indicate how strongly they would recommend each employee for a promotion (0 = not recommended at all, 100 = recommended completely).

Before evaluating employee performance, subjects completed a six-item question concerning allocator goals: "In deciding how to evaluate employees' performance, what are the most important goals for you to consider?" Subjects used a nine-point scale (0 = not at all important, 8 = extremely important) to rate the importance of six goals: three concerned *task-oriented allocation goals* (e.g., "rewarding high quality programming productivity") and three concerned *social-emotional allocation goals* (e.g., "rewarding pleasant and compatible work group behavior"). The items for the two allocation goals exhibited only modest reliability: across the three experiments, the alpha for task goal items was .54 (.43 for Americans, .58 for Chinese; alphas for the three experiments ranged from .40 to .61) and the alpha for social-emotional goal items was .61 (.59 for Americans, .65 for Chinese; alphas for the three experiments ranged from .40 to .70). Despite these low reliabilities, correlations with allocation goals may illuminate our understanding of allocation tendencies. Therefore we calculated the average scores for each goal and retained these measures for use in exploratory analyses.

## RESULTS

We analyzed the data from each experiment using multivariate analysis of variance. Each experiment included two between-subjects variables (culture and allocator gender) along with either two within-subject variables (Exp. 2) or three within-subject variables (Exps. 1 and 3)—combinations of employee seniority, social competence, task competence, and gender. To avoid capitalizing on chance, we adopted a conservative criterion for declaring an effect reliable: we discuss a given result only if the multivariate effect was significant beyond the .01 criterion *and* if the univariate effects were significant for both promotion recommendations and salary allocations. Yet because our work focuses primarily on the effects of seniority, and because it is important to evaluate the

robustness of seniority effects by determining whether they are qualified by interactions with other variables, we briefly mention additional, weaker results involving seniority. Table 1 presents means for effects involving seniority, social competence, and task competence, along with the results of analyses of variance and follow-up tests of simple effects.

### *Do Employee Seniority, Social Competence, and Task Competence Affect Allocation Behavior?*

The first step in analyzing the data we obtained was to determine whether allocation behavior in fact is influenced by variations in employee seniority, social competence, and task competence. In agreement with expectations, the analyses revealed significant multivariate main effects of seniority level for both experiments in which this variable was manipulated (Exps. 1 and 2; in Table 1, see statistics in italics under "Seniority Main Effect"; for example, in Exp. 1, the *F* for the multivariate main effect of seniority was 66.75). The univariate analyses revealed that the seniority effect was significant for both salary allocations and promotion recommendations (see statistics under *F*, *df*, and *p*<; for example, for salary allocations in Exp. 1, the *F* for the univariate main effect of seniority was 81.33). Examination of the means in Table 1 reveals that subjects consistently allocated greater rewards to employees with high seniority than to their counterparts with low seniority (see means under "High Seniority" and "Low Seniority"). Also, the analyses revealed significant multivariate main effects of social competence and task competence for both experiments in which these variables were manipulated (Exps. 1 and 3). Subjects consistently allocated greater rewards to employees with high social and task competence than to those with low social and task competence, for both salary and promotions.

The analyses also revealed an unexpected multivariate interaction of social competence with task competence—an effect that was significant for both allocation measures in both experiments in which these variables were manipulated (Exps. 1 and 3; for example, for salary allocations in Exp. 1, the *F* for the univariate interaction of social competence within the condition of high task competence was 212.81). The two-factor

Table 1. Effects of Employees' Seniority, Social Competence, and Task Competence: Means for Each Experimental Condition, Multivariate and Univariate Analyses of Variance, and Follow-Up Tests of Simple Effects

	Seniority Main Effect		F	df	p<
	High Seniority	Low Seniority			
Seniority Mult. F (Exp. 1)			<i>66.75</i>	<i>2,103</i>	<i>.01</i>
Salary allocations	14.07	11.11	81.33	1,104	.01
Promotion recommendations	51.76	40.31	105.67	1,104	.01
Seniority Mult. F (Exp. 2)			<i>52.77</i>	<i>2,104</i>	<i>.01</i>
Salary allocations	29.24	20.77	99.24	1,104	.01
Promotion recommendations	52.29	41.10	47.01	1,104	.01
	Social Competence Main Effect				
	High Social Competence	Low Social Competence			
Social Competence Mult. F (Exp. 1)			<i>282.44</i>	<i>2,103</i>	<i>.01</i>
Salary allocations	16.79	8.39	268.25	1,104	.01
Promotion recommendations	65.52	31.25	548.39	1,104	.01
Social Competence Mult. F (Exp. 3)			<i>480.28</i>	<i>2,110</i>	<i>.01</i>
Salary allocations	17.39	7.65	572.96	1,112	.01
Promotion recommendations	68.71	23.90	734.48	1,111	.01
	Task Competence Main Effect				
	High Task Competence	Low Task Competence			
Task Competence Mult. F (Exp. 1)			<i>509.43</i>	<i>2,103</i>	<i>.01</i>
Salary allocations	17.21	7.98	388.01	1,104	.01
Promotion recommendations	66.10	30.67	747.56	1,104	.01
Task Competence Mult. F (Exp. 3)			<i>538.63</i>	<i>2,110</i>	<i>.01</i>
Salary allocations	18.05	6.99	765.38	1,112	.01
Promotion recommendations	66.04	26.57	619.71	1,111	.01
	Social Competence by Task Competence Interaction				
	High Social Competence	Low Social Competence			
Social Competence × Task Competence Mult. F (Exp. 1)			<i>21.13</i>	<i>2,103</i>	<i>.01</i>
Salary allocations			31.63	1,104	.01
High task competence	22.52	11.89	212.81	1,107	.01
Low task competence	11.06	4.89	186.76	1,107	.01
Promotion recommendations			29.81	1,104	.01
High task competence	89.03	43.16	509.43	1,107	.01
Low task competence	42.00	19.34	323.11	1,107	.01
Social Competence × Task Competence Mult. F (Exp. 3)			<i>36.11</i>	<i>2,110</i>	<i>.01</i>
Salary allocations			52.83	1,112	.01
High task competence	24.30	11.80	350.64	1,115	.01
Low task competence	10.48	3.49	327.03	1,115	.01
Promotion recommendations			52.14	1,112	.01
High task competence	92.93	39.14	651.74	1,115	.01
Low task competence	44.48	8.65	332.70	1,115	.01
	Seniority by Social Competence Interaction				
	High Seniority	Low Seniority			
Seniority × Social Competence Mult. F (Exp. 1)			<i>10.39</i>	<i>2,103</i>	<i>.01</i>
Salary allocations			15.33	1,104	.01
High social competence	18.77	14.81	73.31	1,107	.01
Low social competence	9.36	7.41	25.20	1,107	.01
Promotion recommendations			10.96	1,104	.01
High social competence	72.44	58.59	90.69	1,107	.01
Low social competence	31.08	22.03	54.97	1,107	.01

Note: Multivariate statistics are presented in italics.

interaction was explained by the fact that although social competence consistently influenced allocations, the effect of variations in social competence was somewhat stronger among employees with high task competence than among those with low task competence; that is, variations in social competence “mattered more,” given high task competence.

*Does Seniority-Based Allocation Result from Second-Order Merit-Based Reward?*

Earlier we speculated that allocators might distribute rewards on the basis of seniority in part because of the assumed covariation of seniority with merit. That is, senior group members may receive greater rewards not simply because they are senior, but because they are believed to possess greater task competence or social competence. Accordingly, across the several experiments we “unconfounded” seniority by orthogonally manipulating seniority, social competence, and task competence. If the “second-order merit” explanation is valid, seniority should interact with social competence and/or task competence in affecting allocations: seniority-based allocation should be most evident when a group member exhibits high competence of one or both sorts. Under conditions of low task or social competence, seniority effects should be attenuated or eliminated.

In partial support of the second-order merit explanation, when employee seniority and social competence were manipulated in a single experiment (Exp. 1), these variables interacted in influencing allocations (see Table 1). Tests of simple effects revealed that the tendency toward seniority-based allocation was significant among employees with both high *and* low social competence. The two-factor interaction was explained by the fact that although seniority consistently influenced allocations, the effects of this variable were somewhat stronger among employees with high social competence than among those with low social competence; that is, variations in seniority “mattered more” under conditions of high social competence.

Inconsistent with the second-order merit explanation was our finding that results for the two-factor interaction of seniority with task competence did not meet our criterion for declaring an effect reliable: the multivariate

effect was weak, and was explained by only one allocation measure. Moreover, tests of simple effects revealed that variations in seniority influenced allocations across all levels of task competence: the *F*s for all tests of simple effects exceeded 30.00. Also, seniority-based allocation was greater, if anything, among employees with *low* task competence than among those with high task competence: for salary and promotions, the *F*s for the seniority simple effect within the condition of high task competence were 32.78 and 46.41, whereas those for the condition of low task competence were 74.33 and 93.17. No other interactions of seniority with either task competence or social competence met our criterion for declaring an effect reliable. The only effect that approached this standard was the three-factor interaction of seniority with social competence and task competence: the multivariate effect was weak, and was explained by only one measure. Once again, tests of simple effects revealed that variations in seniority exerted strong effects on allocation behavior across all combinations of social and task competence (the *F*s for all tests of simple effects exceeded 20.00); the impact of seniority was not seriously qualified by this weak three-factor interaction.

Thus the tendency toward seniority-based reward allocation is quite robust, and is evident among group members with both low and high task competence, among members with both low and high social competence, and for both salary allocations and promotion recommendations. Also, we found little evidence that seniority-based allocation was seriously attenuated among members with low task competence; in fact, seniority-based reward was somewhat stronger among members with *low* task competence. At the same time, we found some support for the proposition that seniority-based allocation may result from the assumed covariation of seniority with social competence. The seniority-by-social competence interaction was significant: the tendency to engage in seniority-based allocation was stronger among members with high social competence than among their counterparts with low social competence. These findings partially support the claim that seniority-based allocation results in part from second-order merit-based reward, emerging as a partial artifact of the assumed covariation of seniority with social competence.

*Is Seniority-Based Allocation a Culture-Specific Value?*

Earlier we speculated that the tendency toward seniority-based allocation might be a culture-specific value—a value that is more compatible with the collectivistic orientation of Eastern cultures than with the individualistic orientation of Western cultures. We anticipated that Western individualism might yield greater tendencies toward reward distribution based on individual merit. Accordingly we conducted our experiments in both the United States and Taiwan. If the “culture-specific value” explanation has merit, seniority should interact with culture in affecting allocations: tendencies toward seniority-based allocation should be stronger among Chinese than among American subjects. Table 2 presents means for effects involving allocator culture, along with the results of analyses of variance and follow-up tests of simple effects.

In keeping with our characterization of Western individualism, the multivariate interaction of allocator culture with task competence was significant for both experiments in which task competence was manipulated (Exps. 1 and 3). Tests of simple effects revealed that employees with high task competence consistently received greater allocations than did those with low task competence. The two-factor interaction was explained by the fact that although task competence consistently influenced allocations, differentiation on the basis of this variable was stronger among American than among Chinese allocators; that is, American allocators paid more attention than did Chinese allocators to variations in employee task competence.

This effect was qualified by an interaction of culture with task competence and employee sex. Follow-up analyses and tests of simple effects revealed 1) that task competence consistently affected allocations, regardless of culture or employee sex, but 2) that the effect of task competence tended to be stronger among American than among Chinese allocators, and 3) that especially among Chinese, allocation on the basis of task competence tended to be stronger in allocations to female than to male employees. That is, the task-competence effect was greatest among American allocators distributing rewards to male or female employees, intermediate for Chinese distributing rewards

to female employees, and weakest for Chinese distributing rewards to male employees.

Inconsistent with the culture-specific value explanation advanced in our introduction, the multivariate interaction of culture with seniority was not significant in either experiment in which we examined this effect (Exps. 1 and 2). Instead the analyses revealed a significant multivariate interaction of culture with employee seniority and employee sex. Follow-up analyses and tests of simple effects revealed 1) that variations in seniority level consistently affected allocations to male employees, 2) that among male employees, the seniority effect was significantly stronger among Chinese than among American allocators, and 3) that among female employees, the seniority effect was significantly stronger among American than among Chinese allocators. (The seniority effect was not significant among Chinese allocators distributing rewards to female employees.) That is, the tendency toward seniority-based allocation was greatest for Chinese allocators distributing rewards to male employees, intermediate for Americans distributing rewards to male or female employees, and weakest for Chinese distributing rewards to female employees.

No other interactions of culture with seniority, task competence, or social competence met our criterion for declaring an effect reliable. The only effect that approached this criterion was a marginally significant three-factor multivariate interaction of culture with seniority and task competence—an effect that was explained by just one of two measures. Follow-up tests revealed that variations in seniority consistently influenced allocations (the *F*s for all tests of simple effects exceeded 10.00), and that, if anything, the effects of seniority were stronger among Americans than among Chinese: for promotions, the *F*s for the seniority effect within the conditions of low and high task competence were 38.23 and 50.72 among Americans, but only 10.82 and 43.81 among Chinese.

What are the implications of these findings for our knowledge of culture-specific values regarding reward allocation? First, although both American and Chinese allocators exhibited merit-based allocation—distributing greater rewards to group members with greater task competence—this tendency was somewhat more marked among Americans. Even when we take into account interactions with employee sex, it remains clear that the

Table 2. Effects Involving Allocator Culture, Allocator Sex, and Employee Sex: Means for Each Experimental Condition, Multivariate and Univariate Analyses of Variance, and Follow-Up Tests of Simple Effects

	Culture by Task Competence Interaction				
	High Task Competence	Low Task Competence	F	df	p<
Culture × Task Competence Mult. F (Exp. 1)			<i>21.84</i>	<i>2,103</i>	<i>.01</i>
Salary allocations			19.70	1,104	.01
American allocators	17.98	7.15	290.58	1,064	.01
Chinese allocators	16.03	9.22	1551.71	1,042	.01
Promotion recommendations			29.19	1,104	.01
American allocators	67.98	21.76	613.07	1,064	.01
Chinese allocators	63.25	32.35	242.85	1,042	.01
Culture × Task Competence Mult. F. (Exp. 3)			<i>25.53</i>	<i>2,110</i>	<i>.01</i>
Salary allocations			41.26	1,112	.01
American allocators	19.35	5.75	457.42	1,056	.01
Chinese allocators	16.80	8.18	324.42	2,058	.01
Promotion recommendations			23.97	1,112	.01
American allocators	67.94	20.93	468.40	1,056	.01
Chinese allocators	64.15	32.10	217.01	1,058	.01
	Culture by Employee Sex by Task Competence Interaction				
	High Task Competence	Low Task Competence			
Culture × Employee Sex × Task Competence Mult. F. (Exp. 3)			<i>6.39</i>	<i>2,110</i>	<i>.01</i>
Salary allocations			5.90	1,112	.02
American allocators					
Male employees	19.00	5.72	357.80	1,056	.01
Female employees	19.69	5.79	440.52	1,056	.01
Chinese allocators					
Male employees	16.42	9.14	149.05	1,058	.01
Female employees	17.18	7.22	284.08	1,058	.01
Promotion recommendations			9.43	1,111	.01
American allocators					
Male employees	68.99	24.46	305.81	1,056	.01
Female employees	66.89	17.41	458.32	1,056	.01
Chinese allocators					
Male employees	63.24	38.77	103.20	1,058	.01
Female employees	65.06	25.43	234.28	1,058	.01
	Culture by Employee Sex by Seniority Interaction				
	High Seniority	Low Seniority			
Culture × Employee Sex × Seniority Mult. F. (Exp. 2)			<i>9.44</i>	<i>2,104</i>	<i>.01</i>
Salary allocations			18.99	1,104	.01
American allocators					
Male employees	29.15	20.95	28.42	1,061	.01
Female employees	29.12	20.77	34.57	1,061	.01
Chinese allocators					
Male employees	34.19	19.33	85.88	1,047	.01
Female employees	24.56	21.96	2.28	1,047	.14
Promotion recommendations			6.51	1,104	.01
American allocators					
Male employees	54.26	39.79	18.07	1,061	.01
Female employees	50.26	43.63	4.04	1,061	.05
Chinese allocators					
Male employees	59.42	34.81	59.86	1,047	.01
Female employees	45.23	45.82	0.03	1,047	.86

Note: Multivariate statistics are presented in italics.

tendency to base allocations on task competence was stronger among Americans. These findings are consistent with our assumption that Western individualism yields greater tendencies toward reward distribution based on individual merit. Culture-specific values regarding seniority, however, appeared in a form that differed somewhat from expectations. Chinese allocators exhibited greater tendencies than Americans toward seniority-based allocation among male group members; among female group members, however, this tendency was greater among Americans. (Chinese did not attend to seniority in allocating rewards to females.) Thus the presumed greater collectivism of Eastern cultures appears to operate in a rather selective manner, yielding enhanced attention to issues involving hierarchical role relations primarily among male group members. These findings support the argument that seniority-based allocation is colored by cultural values, although such values appear to differ in form from that which we had anticipated.

*Additional Results Involving Employee Sex*

The analyses revealed two significant multivariate effects involving employee sex. Table 3 presents means for effects involving this variable, along with the results of

analyses of variance and follow-up tests of simple effects.

First, the multivariate interaction of task competence with employee sex was significant: differential allocation on the basis of task competence was somewhat stronger among female than among male employees. Recall that this effect was qualified by a higher-order interaction with culture (see Table 2, "Culture by Employee Sex by Task Competence Interaction"): although task competence consistently affected allocations, this effect tended to be stronger among Americans than among Chinese allocators. Among Chinese, allocation on the basis of task competence tended to be stronger in allocations to female than to male employees.

Second, the multivariate interaction of seniority with employee sex was significant: differential allocation on the basis of seniority was somewhat stronger among male than among female employees. Recall that this effect, too, was qualified by a higher-order interaction with culture (see Table 2, "Culture by Employee Sex by Seniority Interaction"): among American allocators, the seniority effect was significant for both male and female employees. In contrast, Chinese allocators exhibited significant seniority-based allocation for male but not for female employees.

Table 3. Additional Effects Involving Employee Sex: Means for Each Experimental Condition, Multivariate and Univariate Analyses of Variance, and Follow-Up Tests of Simple Effects

	Employee Sex by Task Competence Interaction				
	High Task Competence	Low Task Competence	F	df	p<
Employee Sex × Task Competence					
Mult. F (Exp. 3)			<i>21.22</i>	<i>2,110</i>	<i>.01</i>
Salary allocations			14.91	1,112	.01
Male employees	17.69	7.46	364.09	1,115	.01
Female employees	18.42	6.51	619.99	1,115	.01
Promotion recommendations					
Male employees	66.09	31.67	301.78	1,115	.01
Female employees	65.97	21.46	618.44	1,115	.01
	Employee Sex by Seniority Interaction				
	High Seniority	Low Seniority			
Employee Sex × Seniority					
Mult. F (Exp. 2)			<i>11.55</i>	<i>2,104</i>	<i>.01</i>
Salary allocations			17.59	1,104	.01
Male employees	31.35	20.25	91.71	1,109	.01
Female employees	27.13	21.29	26.89	1,109	.01
Promotion recommendations			20.38	1,104	.01
Male employees	56.51	37.62	61.65	1,109	.01
Female employees	48.06	44.58	2.13	1,109	.15

Note: Multivariate statistics are presented in italics.

*Correlations with Allocator Goals*

In addition to distributing salary and recommending promotions, subjects rated the importance of task and social-emotional goals as the basis for evaluating employees. Although the set of measures designed to tap each allocation goal exhibited only moderate reliability, we retained these measures in the hope that they might nevertheless illuminate our understanding of allocation processes. First, we collapsed the data across experiments and performed a two-factor multivariate analysis of variance to determine whether allocator goals differed as a function of allocator culture or allocator sex. This analysis revealed a significant multivariate effect of allocator culture (Mult,  $F[2, 328] = 15.53, p < .01$ ). In keeping with the results for actual allocation behavior, Americans reported stronger task goals than Chinese (respective  $M_s = 3.55$  vs.  $3.27$ ;  $F[1, 329] = 30.91, p < .01$ ); the main effect of culture was not significant for social-emotional goals ( $F[1, 329] = 0.12, n.s.$ ). The multivariate main effect of allocator sex was not significant, nor was the interaction of allocator culture with allocator sex.

Then, to evaluate the link between allocator goals and actual allocation behavior, we had to develop summary measures of allocation behavior. For each subject—separately for the salary and the promotion measures—we calculated four measures: *seniority-based allocation*—average allocation to employees with high seniority minus average allocation to those with low seniority; *social competence-based allocation*—average allocation to employees with high social competence minus average allocation to those with low social competence; *task competence-based allocation*—average allocation to employees with high task competence minus average allocation to those with low task competence; and *sex-based allocation*—average allocation to men minus average allocation to women. We then calculated correlations between 1) measures of the two allocator goals, social-emotional and task-oriented; and 2) eight measures of actual allocation behavior: seniority-based, social competence-based, task competence-based, and sex-based allocation behavior for both salary and promotions. The strength of the obtained correlations did not differ significantly between salary and promotions. Also,

we performed parallel analyses separately for American and for Chinese women and men; we observed no substantively meaningful differences across subgroups. Accordingly, using Fischer's  $r$ -to- $z$  transformation, we averaged the results of these analyses across type of reward (salary, promotions) and across experiments.

In keeping with expectations, social competence-based allocation was correlated positively with social-emotional allocation goals ( $r = .21, p < .05$ ) but was not correlated with task goals ( $r = -.04, n.s.$ ; these correlations differ significantly,  $z = 3.74, p < .01$ ). That is, subjects with stronger social-emotional goals exhibited greater tendencies to differentiate on the basis of social competence. Also in agreement with expectations, task competence-based allocation was correlated positively with task-oriented goals ( $r = .26, p < .01$ ); surprisingly, task competence-based allocation was correlated *negatively* with social-emotional goals ( $r = -.18, p < .05$ ; these correlations differ significantly,  $z = 6.59, p < .01$ ). That is, subjects exhibited greater tendencies to differentiate on the basis of task competence insofar as they had stronger task-oriented goals and weaker social-emotional goals. Thus, despite their unreliability, one can argue that our measures are valid indices of allocation motives.

Given that social-emotional goals promote differential allocation on the basis of social competence, and given that task goals promote differential allocation on the basis of task competence, our measure of seniority-based allocation should be correlated significantly with one or both measures of allocation goals, insofar as seniority-based allocation occurs in part because of the assumed covariation of seniority with social or task competence. Seniority-based allocation behavior, however, was correlated with neither task-oriented goals ( $r = .10, n.s.$ ) nor social-emotional goals ( $r = -.01, n.s.$ ; these correlations do not differ). Also, sex-based allocation was correlated with neither task goals ( $r = .05, n.s.$ ) nor social-emotional goals ( $r = -.03, n.s.$ ; these correlations do not differ).

## DISCUSSION

The present research revealed some support for the proposition that seniority-based allocation emerges in part because of the assumed covariation of seniority with competence.

Such assumed covariation, however, appears to be limited to social competence: as hypothesized, the interaction of seniority with social competence was significant; seniority exerted more powerful effects on reward allocation to socially competent group members than to those with low social competence. In contrast, the interaction of seniority with task competence did not meet our criterion for declaring an effect to be reliable. If anything, the analyses suggested that seniority-based allocation was stronger among members with *low* task competence than among their counterparts with high task competence. In addition, correlational analyses revealed that the tendency to distribute rewards on the basis of seniority was uncorrelated with task-oriented and social-emotional allocation goals. Moreover, the tendency toward seniority-based allocation was pervasive, occurring in weaker but significant form even among group members with low social competence. Thus the second-order merit explanation is supported only partially, and provides only a partial account of the robust tendency toward seniority-based distribution of group rewards.

Do culture-specific values form the basis for reward allocation behavior? In keeping with expectations, the interaction of culture with members' task competence was significant: the tendency to allocate rewards on the basis of task competence was more marked among Americans than among Chinese. This finding is congruent with the claim that the intense individualism of Western culture promotes enhanced tendencies toward merit-based allocation (Bellah et al. 1985; Hofstede 1980; Miller 1991). The greater collectivism of Eastern culture, however, was manifested in an unexpected form. In partial support of the claim that seniority is a greater consideration in Eastern than in Western cultures, the Chinese exhibited greater seniority-based allocation among male group members than did the Americans. Chinese allocators, however, did not attend to seniority when distributing rewards to female group members: senior women received remarkably low rewards. This finding is reminiscent of research cited earlier, in which Eastern cultures were said to employ seniority norms in a rather contingent manner, applying them primarily to "full status" employees (see Baer 1987). It is possible that among Chinese, female workers are not considered career employees, or that

women are regarded otherwise as second-class group members.

In addition, seniority was quite a robust determinant of reward distribution, exerting significant effects on allocation behavior regardless of culture and of member attributes. The qualifications to this effect tended to be relative rather than absolute. Thus, despite almost complete neglect of this topic in the literature on justice norms, the strength and the consistency of seniority-based distribution suggest that seniority level is quite a general normative basis for reward allocation.

Accordingly it becomes important to ask why the seniority norm exists. This question involves two key subissues: 1) why do seniority norms emerge in the first place? and 2) how and why do seniority norms persist over time? We assume that group norms governing the distribution of rewards emerge because they have functional value: that is, at some level such rules promote effective group functioning or enhance the group members' well-being. What group goals might be served by adhering to seniority norms?

Insko et al. (1980) outlined three possible bases for seniority norms. First, adherence to seniority rules may guarantee that groups benefit from the wisdom of their more experienced members—a variant on our earlier suggestion that seniority stands as second-order merit-based reward. Indeed, the present work revealed evidence that seniority has the greatest impact when combined with social-emotional wisdom. Second, seniority-based allocation may be congruent with "the greater degree of social familiarity among the older members and the lesser familiarity with and among the younger members" (e.g., "good ol' boy networks"; p. 446). It is also possible that senior members have contacts outside the group which have the potential to enhance group functioning (i.e., general "networking" effects). Third, seniority may reduce conflict among group members in that "it guarantees widespread potential access to leadership" and other group rewards (p. 446). That is, seniority rules may serve as an opiate, soothing short-term irritations and perceived injustices by holding out the hope of later recognition. Thus, seniority may be a temporally extended version of the equality rule (i.e., a rather long-term version of turn-taking): if a member remains in the

group long enough, he or she eventually will reap the benefits accruing to senior members.

We also suggest three additional bases for seniority norms. First, rewarding senior members may represent an indirect means of maintaining stable group membership, in that cleaving loyally to the group demonstrably pays off in the long run. Second, if an individual's identity is based to some degree on the group with which he or she is associated (Tajfel and Turner 1986), rewarding senior members may be a means of repaying persons who have contributed to preserving a key self-defining social institution. Finally, it is possible that the seniority effect has a biological basis in that enhanced orientation toward one's elders (i.e., possible attachment objects) plausibly is one component of the attachment system (Bowlby 1969). In future work it would be fruitful to explore these and other nonmerit-based accounts of seniority effects.

How and why do seniority norms persist over time? Presumably such norms are more likely to persist insofar as they continue to yield direct benefits to the group—benefits of the sort outlined above. Also, the persistence of seniority rules should be enhanced insofar as seniority is a “natural” or “easy” allocation standard—for example, to the degree that seniority does not conflict with other group norms, or to the degree that adherence to seniority rules is not costly or effortful. In line with this assumption, Insko et al. (1980) suggest that seniority norms may persist because they involve a natural “continuation of the parent-child relationship” or because they are congruent with the “status difference implied by the teacher-learner interaction required for group indoctrination” (p. 446). Moreover, it is easy to adhere to seniority rules because seniority is salient and unambiguous. In the broadest sense, however, group norms such as the seniority rule can achieve considerable functional autonomy: in the long run, adherence to such a norm can acquire value in itself, independent of any direct functional value (see Kelley and Thibaut 1978).

Our research also provided strong evidence of merit-based allocation in that larger rewards were distributed to group members with superior task and social-emotional competence—that is, to members with greater potential to further the group's social-emotional and instrumental goals. It is

interesting that these attributes paid off in a multiplicative manner, such that the benefits of social competence were greatest among members who simultaneously exhibited high task competence. Group members who furthered multiple group goals were regarded as especially meritorious. In addition, we found that the impact of task competence was stronger among female than among male group members—a sex-based difference that was greater among Chinese than among Americans. It seems plausible that group members may receive greater rewards insofar as their special competencies are less sex-role stereotypical. Specifically, variations in task competence may be regarded as especially meritorious among members who traditionally have been judged to be less concerned with task competence (i.e., women). (In complementary fashion, the analyses revealed suggestive evidence—albeit weak and inconsistently observed—that variations in social competence exert stronger effects on allocations to men than to women.)

What are the implications of these findings for equity theory, the most prominent extant theory of group allocation behavior (see Homans 1976; Walster et al. 1976)? The answer to this question depends largely on the degree to which equity theory is interpreted as a model of merit-based allocation. The present work has demonstrated that senior group members receive greater rewards than their counterparts with low seniority, even when they exhibit low task competence and social competence. That is, seniority influences reward allocation regardless of members' contributions to group goals. Thus, insofar as equity-based reward is equated with merit-based reward, our findings suggest that seniority-based distribution operates above and beyond equity predictions.

If one adopts a broader conceptualization of “equity”—assuming that seniority can be construed as yet another justifiable “input” in determining what constitutes equitable distribution of group rewards—our results can be construed as compatible with equity theory predictions. Yet although equity theory states that the relevance of an input is in the eye of the perceiver, we believe that defining input so broadly as to include virtually *any* input—regardless of its relevance to members' contributions to overall group goals—is to render equity theory a nontheory. We do

not believe that the authors of the theory intended such a broad definition.

### *Strengths and Limitations*

Before concluding, we should note several limitations of the present research. First, subjects in our studies made hypothetical allocations to group members in the position of hypothetical decision makers; we have not examined “real” allocations. The critical issue, however, concerns the validity of the obtained data as an indicator of allocation preferences—not whether our method bears mundane similarity to allocation situations in the real world. In this broader sense, is there good reason to believe that decisions in hypothetical situations are *qualitatively different* from those which would emerge in real allocation settings? Although the precise size of allocations or the relative strength of adherence to various allocation standards might differ somewhat, we see no cogent reason to believe that allocation preferences would differ *in kind* from that which we observed in our experiments.

A second limitation centers on our subject population: participants were college students who probably lacked extensive experience with allocation decisions. Again, however, the critical issue concerns the validity of the obtained data as an indicator of allocation preferences—not whether our sample resembles real-world allocators. In fact, one could argue that the observed power of seniority as a basis for allocation preferences is especially impressive in light of the youthfulness of our subject population, and that the present findings actually may underestimate the power of seniority norms: if anything, seniority should be a weaker determinant of allocation preferences among young participants with limited experience in group allocation situations, in that younger individuals may not fully value or respect senior group members (e.g., “don’t trust anyone over 30”).

A third, related limitation also centers on our subject population. In light of our cross-cultural goals, it is important to ask whether college students in the United States and Taiwan are typical of the citizens of their respective countries. In particular, students at the National Taiwan University have the reputation of being somewhat more Western than the typical Taiwanese, who in turn may

be more Western than Chinese living in mainland China. Thus it is possible that our cross-cultural findings underestimate true differences between American and Chinese cultures.

Several strengths of the present research are also worth noting. First, our findings are based on data obtained in two quite diverse cultures; thus they enhance confidence in the generalizability of the obtained results. Second, our results are based on relatively large samples of individuals. The use of large samples increases the odds of observing subtle and possibly unreliable effects (i.e., effects that may not replicate, as we noted earlier in adopting conservative criteria for interpreting our findings). At the same time, however, we are confident that we have not missed any reliable allocation effects because of low power. Third, by obtaining allocation decisions regarding two group resources—both salary allocations and promotion recommendations—we have provided an additional standard for judging the reliability of a given finding: was a given effect evident for just one or for both resource categories? And forth, given that we conducted three separate experiments to explore possible interactions of employee seniority, social competence, and task competence with one another and with allocator culture, allocator sex, and employee sex, the generality of our findings would seem to have been tested adequately.

### CONCLUSIONS

The present research revealed four key findings regarding allocation behavior in groups. First, these experiments revealed consistent evidence of two forms of merit-based allocation: group members received greater rewards insofar as they exhibited one or both of the meritorious attributes—task competence and social competence—manipulated in this research. Second, this work revealed interesting cultural differences in allocation behavior: the Americans’ marked tendency to differentiate among group members on the basis of task competence supports the characterization of Western culture as highly individualistic and achievement-oriented. In addition, we obtained partial support for the characterization of Eastern culture as oriented more toward issues of hierarchical interdependence, in that the Chinese tended strongly to differentiate on the

basis of seniority among male group members. In distribution of rewards to women, however, the seniority effect was stronger among Americans. Third, it appears that the seniority effect may be explained in part by the assumed covariation of seniority with social-emotional merit, in that the seniority effect was especially marked among group members with high social competence. And fourth, the effects of seniority were quite pervasive, influencing allocation behavior regardless of member attributes such as task or social competence. The above-noted qualifications tended largely to be a matter of degree rather than kind. Thus a primary conclusion to be drawn from these results concerns the robustness of seniority as an allocation norm. Therefore these findings serve as a trumpet call for further research on the origins and functioning of seniority norms—research that complements and extends the explanations proffered here. How and why do seniority rules emerge? And how and why do seniority rules persist over time?

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