Small Group Incentives: A Review of the Literature

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ABSTRACT. A review of the effects of small group incentives indicate that equally-divided small group incentives sustain high levels of productivity and employee satisfaction. Moreover, for groups of 2-12 members, their effects have been comparable to those reported for individual monetary incentives. Although some studies found that differentially-divided group incentives resulted in higher performance than individual incentives and equally-divided group rewards, they were perceived as less fair and satisfying, perhaps due to their competitive nature. Few studies have examined the effects of group incentives on social interactions or the performance of tasks that require interdependent contributions by group members. While results pertaining to the effectiveness of small group monetary incentives have been consistent, questions remain. Particularly important are studies of the relative effects of individual and group feedback when incentives are provided, the effects of group incentives when there are distinct high and low performers, and their effects when pay differences between individual and group incentive conditions are greater. *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-342-9678. E-mail address: getinfo@haworthpressinc.com <Website: http://www.haworthpressinc.com>]*

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In today's global society, businesses are finding it necessary to downsize, streamline, and improve productivity in order to compete in

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the world market. ''The last decade of the twentieth century is witnessing an immense transformation of business systems everywhere-from tightly regulated markets to freer markets, from centralized authoritarian controls to more horizontal systems, from a monopoly on decision making by a few to more widespread participation by widening circles of employees . . . '' (Frederick, Post, & Davis, 1992, p. xxi). This shift was documented by a recent survey conducted by the Hay Group consulting firm. Ninety-one percent of the 500 large and medium US companies surveyed had significantly altered their organizational culture. In addition, 73% acknowledged the need to realign their pay systems to reflect those changes, and 54% had already begun to do so (Flannery, Hofrichter, & Platten, 1996). Toward this end, companies are turning away from traditional hourly wage systems and adopting pay-for-performance plans, a change that began in the early 1980's according to O'Dell and McAdams (1987). These researchers examined the trend of ''nontraditional reward systems'' for the American Productivity Center, and reported that ''More gainsharing, pay-for-knowledge, small group incentive, lump-sum bonus and two-tier plans have been adopted in the last five years than in all of the prior twenty years'' (p. 9).

Organizations are using group-based incentive plans to initiate changes in organizational culture, not merely to support such changes (McAdams & Hawk, 1992). In his book, *The Ultimate Advantage: Creating the High Involvement Organization*, Lawler (1992), whom many consider to be the foremost expert on pay in organizations, advocates paying the person, not the job in order to develop and sustain employee involvement. He states:

> Financial rewards are vital to a proper balance of power, information, knowledge, and rewards in an organization. If such rewards are missing, individuals have no financial accountability for how they use the information, knowledge, and power they are given to improve organizational performance. Lack of financial rewards also can raise major equity issues that can harm an organization's culture. When, as a result of employee efforts, organizational performance improves, employees expect to share in the gains. If they do not share in these gains, they feel exploited and ultimately reject management systems that give them more infor-

> mation, knowledge, and power and ask them for better performance but do not reward them for their performance. (p. 172)

The use of incentives to spur and maintain participative organizational cultures reflects the recent more general trend to improve employee performance by paying for performance. In an article that traced the history of performance pay "from Antiquity to the 1950s," Peach and Wren (1992) commented, "Today, incentives are enjoying a renaissance as critics of the United States' performance in domestic and world markets look for tools to stimulate increased productivity by both workers and managers" (p. 6). That same year, McCoy (1992) heralded "behavior-based incentive compensation" in his book, *Compensation and Motivation,* indicating that the "formula for tapping employee potential" consists of "behavioral psychology + incentive compensation = performance improvement" (p. 16). Acknowledging that trend, also in 1992, the *Journal of Organizational Behavior Management* published a special issue entitled "Pay for Performance: History, Controversy, and Evidence" (Hopkins & Mawhinney, 1992). The Peach and Wren article cited earlier appeared in this volume.

Although pay-for-performance plans vary widely in design, they all have one common element: Employees are given a bonus, incentive, or wage based on their performance, or the performance of their group, department, or organization. Moreover, they are designed to treat compensation as a variable production cost, making the relationship between wages and profitability visible to organizational officials. Thus, officials can control and monitor the cost as they do other economic indices, which helps them improve the organization. "Just as companies seek to maximize the cost/benefit ratio in return on capital investment, they must also maximize the return on their investment in *human* capital" (Buyniski, 1995, p. 62). Because of this, corporate leaders increasingly view pay-for-performance plans as a necessary part of the organizational culture (Rock & Berger, 1991).

Weitzman (1984) advocated profit sharing plans, a popular type of alternative pay system, not primarily as a way to improve organizational performance, but as a way to solve the country's macroeconomic problems. In essence, he views profit sharing as a way to optimize the often conflicting variables of economic progress, employment security and employment growth, the type of research agenda that Mawhinney (1992) more recently challenged behavior analysts to

undertake. According to Weitzman, large scale adoption of profit sharing would decrease unemployment and check inflation during periods of economic instability. As a result, not only would jobs be more secure, but the economy would be spurred. Weitzman's theoretical argument is based on two related assumptions. First, that profit sharing substitutes to some degree for straight wages; that is, that at least part of the worker's pay is put at risk so that labor costs fluctuate in accordance with profits to a degree that permits organizations to retain workers when profits fall (Blinder, 1990). Second, profit sharing must improve employee performance and profitability; that is, the costs of profit sharing must outweigh the incentives paid to employees (Blinder, 1990). Blinder points out the relationship between these two assumptions in the following quote:

> But his argument is predicated on the idea that sharing substitutes for straight wages. If, instead, workers on profit sharing earn more than workers on straight wages, we should not expect profit sharing to raise employment-unless, of course, it raises productivity sharply. . . (p. 3)

Both assumptions of profit sharing have been challenged. Mitchell, Lewin, and Lawler (1990), for example, found that incented workers were not paid lower straight wages and, in addition, earned more per hour than other workers. As noted by Blinder (1990), if these higher wages were offset by productivity improvements, then the goals of profit sharing would still be realized. However, several notable researchers and compensation experts have convincingly argued that both data and theory belie such productivity improvements (e.g., Blinder, 1990; Card, 1990; Dickinson & Gillette, 1993; McCoy, 1992; Lawler, 1990, 1992). It is beyond the scope of the current paper to present their detailed arguments, but nonetheless, at this point in time, it appears that profit sharing has not led to the macroeconomic gains that were proposed by Weitzman, and thus should not be promoted on this basis.

While there are many forms of alternative pay systems (e.g., pay-for-knowledge, lump-sum bonuses, two-tiered wage systems), there are four basic plans that use a predetermined formula to tie compensation to objective operational or economic measures: individual incentives, group incentives, gainsharing, and profit sharing (Abernathy, 1989; McAdams & Hawk, 1992). Although some refer to other types

of plans as ''pay-for-performance'' systems, without an announced formula and objective measures, pay cannot truly be contingent on worker performance (Abernathy, 1989; Mitchell et al., 1990). The defining features of the four basic pay-for-performance plans are identified in the following paragraph together with an analysis of the extent to which the incentives are linked to individual performance.

Individual incentives are based only on the performance of the employee; they do not rely on the performance of others. Thus, of the plans mentioned, they provide the strongest link between an individual's pay and his or her performance. In contrast, group incentives (sometimes referred to as ''team incentives'') rely on both the performance of the employee and that of others in the employee's designated group. Rollins (1989) defines a group incentive plan as ''a unit wide bonus system that is designed to reward all eligible members of a group for improved performance'' (p. 40). Similarly, Heneman and Von Hippel (1995) describe group based reward systems as plans that ''measure group performance and reward individuals on the basis of how well the group performs'' (p. 63). The group may consist of only two members, or the employees of an entire department, but irrespective of the number of group members the amount of the reward is based on the performance of the entire group (Schuster & Zingheim, 1992). Although the amount of money available for disbursement is dependent on the group's performance, the incentives can be divided equally among group members or differentially awarded based on member contribution. The extent to which rewards are linked to individual performance depends upon the size of the group as well as the disbursement method. Gainsharing plans typically reward individuals based on departmental, divisional, or organizational economic goals. In gainsharing, the performance of any one employee often has little influence over the critical measure, and therefore is less related to the reward received. Unlike incentives that are paid to employees in frequent salary checks, gainsharing bonuses are typically distributed monthly or quarterly (Buyniski, 1995). Profit sharing rewards are based on the success of the entire organization, and are usually calculated annually. As with gainsharing, an individual's performance has little effect on the critical measure, company profitability, and, as a result, there is little relation between the employee's performance and the amount of the bonus. The larger the organization, the smaller the relation becomes. Profit sharing awards, as well as some gainsharing

awards, are often placed in the employee's retirement or 401K account, and thus the employee does not actually benefit from the award for years.

As noted by Dickinson and Gillette (1993) and Mitchell et al. (1990), it is difficult to determine the relative prevalence of pay-for-performance systems because surveyors have adopted different definitions and inclusion criteria for pay plans. For example, Lawler, Ledford, and Mohrman (1989) included sales commissions and executive bonus plans as individual incentive systems but Peck (1990) excluded them. Similarly, McAdams and Hawk (1992) excluded any plan (such as profit sharing and gainsharing) that deferred rewards to a savings or pension plan. Nonetheless, in terms of the four basic types of plans, most have concluded that profit sharing is the most common, followed closely by individual incentives, then group incentives and gainsharing (Gowen, 1991; Mitchell et al., 1990; O'Dell & McAdams, 1987). When discrepancies have arisen, they have been due to the reversal of the prominence of profit sharing and individual incentives (Lawler et al., 1989; Peck, 1990). Although group incentives have generally been reported to be more popular than gainsharing, Peck found them to be similarly prevalent (13% and 12%, respectively), as did a 1994 Hay Group survey. Moreover, respondents to this later survey indicated greater interest in group incentives, with 39% reporting that they were considering some form of team based pay (Gross, 1995).

Although not widely used, group incentive systems are currently found in a variety of industries where the work requires group rather than individual effort. Peterson (1992), for example, identified six manufacturing industries in which at least 50% of incented employees were covered by group plans: meat packing, corrugated and solid fiber boxes, clay sewer pipes, wood household furniture, candy and other confectionery, and brick and structural clay. Furthermore, because group pay systems are consistent with the work team philosophy that has become prevalent in US companies, Flannery et al. (1996) predict that their number will increase greatly in upcoming years.

In evaluations, conducted primarily through surveys, group incentive plans based on operational measures have fared well. Conclusions from these surveys are based both on the opinions of organizational officials as well as financial measures such as the dollar value of the organization's performance gain per employee per year, incentive payout per employee per year, and percent of gains shared with employees

(McAdams & Hawk, 1992; McCoy, 1992; O'Dell & McAdams, 1987). Surveys are, of course, prone to response bias. However, those described and reported by McAdams and Hawk (1992) and O'Dell and McAdams (1987) are particularly noteworthy because of their attempts to obtain comparative objective financial measures.

Evaluations have examined the type of plan (e.g., profit sharing, gain sharing, group incentives, and individual incentives) as well as whether payouts are based on operational or financial measures, or a combination of the two. Operational measures include indices of productivity, quality, safety, attendance, and cost reduction. In contrast, financial payouts are based on profit and loss measures such as profits, earnings, and/or return on investment calculations (McAdams & Hawk, 1992). If group plans use financial measures, they are typically referred to as "profit-sharing" or "gain-sharing;" if they use operational measures, they are usually categorized as "group incentive systems." However, the correspondence is not perfect. For example, some gainsharing plans distribute awards based on the profitability of the department, but profitability is directly linked to group operational measures. Moreover, in some cases, the worker's share is determined by the extent to which his or her performance contributes to the group output. These hybrid plans may be classified as either financial or operational plans. With respect to comparative evaluations of effectiveness and acceptance by employees, in 1989, Rollins indicated, "There is increasing evidence from a variety of independent sources that suggest . . . one nontraditional reward system is more effective and better accepted than any other: the productivity-based group incentive plan" (p. 40). In one survey, 75% of the 185 companies who used small group incentives reported positive effects (O'Dell & McAdams, 1987). In another, 81% reported favorable reactions by employees and, while broad-based plans such as gainsharing and profit sharing scored slightly higher in terms of favorable employee reaction, no other reported incentive plan scored higher in the category of improved results (McCoy, 1992). In that survey, 67% of the organizations reported bottom-line improvements.

Several factors may account for the relative success of operational-based group incentive systems. To influence employee behavior, there must be an obvious link between the worker's pay and performance (Conrad, 1994; Dickinson & Gillette, 1993; Jensen & Murphy, 1990; McNally, 1988). Conrad (1994), for example, asserted that in order to

benefit from a pay system ''organizations must design systems that indeed do link rewards to performance'' (p. 157). The tighter the link, the greater the influence on employee performance (Conrad, 1994; Lawler, 1990; McAdams & Hawk, 1992). Most financial plans base payouts on corporate or divisional economic indices. Operational indices not only provide a more direct measure of worker performance, but also measure at lower levels in the organization (e.g., the department or team level). Both features increase a plan's ''line of sight,'' which refers to the extent to which an employee feels that he/she can actually influence results, and hence pay (Lawler, 1990; McAdams & Hawk, 1992). Similarly, Perry (1988) maintains that plans such as profit sharing are not effective motivators because ''most employees have little influence on profits'' (p. 52).

The size of the payout group also affects the link between worker performance and pay. In small groups, workers can substantially influence the group's performance. However, ''as the group size increases, the capacity of an individual worker to control his or her wages under group incentive conditions decreases'' (Honeywell, Dickinson, & Poling, 1997, p. 262). Blinder (1990) refers to this as the ''1/nth problem,'' in which ''n'' represents the number of employees in the group. As ''n'' increases, worker performance is likely to decrease. Because operational group incentive plans typically cover significantly fewer employees than profit sharing or gainsharing, they are likely to be more successful. Finally, as indicated earlier, group incentives are typically distributed much more frequently than profit sharing or gainsharing bonuses, which is another factor that correlates with the effectiveness of pay-for-performance systems (Lawler, 1990; McAdams & Hawk, 1992).

Table 1 summarizes experimental (as opposed to survey) studies of productivity-based group incentive systems. The studies span from 1952 to 1997, and were published in a variety of journals by researchers from different disciplines. The following sections discuss the major findings of these studies with respect to the effects of: (a) individual and group incentives on performance and satisfaction, (b) individual and group incentives on social interactions, (c) group incentive distribution methods on performance and satisfaction, and (d) group incentives and task structure on performance.

To assist the reader, Tables 2 and 3 summarize the results of the studies presented in Table 1 and the analyses that will be presented in

TABLE 1. Summary of Productivity-Based Small Group Incentive Studies

Authors	Subjects	Dependent Variables	Independent Variables	Results
Allison, Silverstein, & Galante, 1992	Teaching assistants of handicapped children (1 group of 12)	1. Tasks completed 2. Social acceptability	Hourly pay with feedback and feedback with individual, group cooperative, and group competitive incentives	1. Performance higher under incentives, and highest under cooperative incentives 2. Acceptability higher with cooperative incentives
Campbell, 1952	Employees in two factories	1. Productivity 2. Ability to calculate incentives 3. Satisfaction	Group incentives with groups of under 20 to over 100	1. Performance & ability to calculate incentives decreased as group size increased 2. For those who could calculate incentives, satisfaction was not affected; for those who couldn't, satisfaction decreased as group size increased
Farr, 1976	College students (48 groups of 3)	1. Cards sorted 2. Pay fairness 3. Satisfaction	Hourly pay, individual incentives, and group incentives that were equally or differentially divided	1. Performance higher with incentives, and highest with group differential incentives 2. Group differential incentives rated least fair 3. Satisfaction with task and pay did not differ
Honeywell, Dickinson, & Poling, 1997	College students (2 groups of 10)	1. Cards sorted 2. Satisfaction	Individual and group incentives	1. Performance did not differ 2. Satisfaction did not differ, although high performers preferred individual incentives
London & Oldham, 1977	College students (35 groups of 2)	1. Cards sorted	Individual and group incentives based on high, low, or average performance	1. Performance highest under individual & high performer group incentives
Marriott, 1949	Production workers in two companies	1. Productivity	Group incentives, with groups of under 10 to over 50	1. Performance decreased as group size increased

TABLE 1 (continued)

Authors	Subjects	Dependent Variables	Independent Variables	Results
Miroff, Naylor, Lubeach, Greenberg, Gillen, Sitarsky, & Duncan, 1993	College students (4 groups of 5)	1. Parts produced	1. Hourly pay & group incentives 2. Additive or discretionary tasks	1. Performance higher under incentives 2. Incented performance comparable for types of tasks
Roberts & Leary, 1990	College students (5 groups of 2,4, or 9)	1. Parts produced 2. Attendance	1. Individual & group incentives	1. Performance and attendance did not differ
Smoot, 1997	College students (6 groups of 3)	1. Parts produced	1. Hourly pay, group & individual incentives (linear, positively & negatively accelerating)	1. Performance higher under incentives 2. Performance comparable for group and individual incentives
Stoneman & Dickinson, 1989	College students (8 groups of 2,4,5, or 9)	1. Parts produced	1. Individual & group incentives	1. Performance did not differ
Weinstein & Holzbach, 1973	College students (21 groups of 3)	1. Correctly coded surveys	1. Group incentives that were equally or differentially divided 2. Additive or conjunctive tasks	1. Performance highest with differentially divided incentives and additive task
Zywiczynski, Thurkow, Vunovich, & Shimamune, 1992	College students (2 groups of 4)	1. % of positive and negative social interactions	1. Individual & group incentives	1. Positive interactions slightly greater with group incentives 2. No change in negative interactions

the remainder of the paper. In effect, these tables provide a cross-tabulation of the independent and dependent variables examined in these studies. Table 2 displays the effects of group incentives on performance, satisfaction, and social interactions, and Table 3 displays the effects of group incentives on the performance of tasks that are structured differently. The first column of these tables indicates the type of comparison that is being made. For example, the first comparison

TABLE 2. Effects of Group Incentives on Performance, Satisfaction and Social Interactions

Type of Comparison	Relevant Study Features (1)	Relevant Study Features (2)	Studies	Results: Performance Higher	Performance Equal	Performance Lower	Satisfaction Higher	Satisfaction Equal	Satisfaction Lower	Social Interactions Higher	Social Interactions Equal	Social Interactions Lower
Group vs Individual Incentives	Equal Rewards	Small Group*	Allison et al. (1992)	X			X					
			Farr (1976)		X			X				
			Honeywell et al. (1997)		X			X			X	
			London & Oldham (1977)		X							
			Smoot (1997)		X							
			Stoneman & Dickinson (1989)		X							
			Roberts & Leary (1990)		X							
			Zywiczynski et al. (1992)							X		
		Large Group	Campbell (1952)			X			X			
			Marriott (1949)			X						
	Differential Rewards	Small Group	Allison et al. (1992)		X							
			Farr (1976)	X					X			
Differentially vs Equally Divided Group Rewards		Small Group	Allison et al. (1992)		X				X			
			Farr (1976)	X					X			
			Weinstein & Holzbach (1973)	X								

*Small Group = 2-12 members

made in Table 2 is between group and individual monetary incentives. An ''X'' in the ''Higher'' Performance column indicates that subject performance was higher under group incentives than under individual incentives. An ''X'' in the ''Lower'' Satisfaction column indicates that subjects were less satisfied with group incentives than they were with individual incentives. The second comparison made in Table 2 is between differentially-divided rewards and equally-divided rewards. In this case, an ''X'' in the ''Higher'' Performance column indicates that differentially-divided rewards resulted in higher performance. The relevant dimensions of the studies are listed in the columns headed ''Relevant Study Features.'' In Table 2, these columns indicate whether rewards were equally or differentially divided among group members and whether the size of the group was small (2-12 members) or large (over 20 members). Similarly, in Table 3, these columns

TABLE 3. Effects of Group Incentives on the Performance of Tasks That Are Structured Differently

Type of Comparison	Relevant Study Features (1)	(2)	(3)	Studies	Performance Higher	Equal	Lower
Group Incentives vs. Base Pay	Equal Rewards	Small Group*	Additive and Discretionary Tasks	Miroff et al. (1993)	X		
Additive vs. Discretionary Task	Equal Rewards	Small Group		Miroff et al. (1993)		X	
Additive vs. Conjunctive Task	Equal Rewards	Small Group		Weinstein & Holzbach (1973)	X		
Additive vs. Conjunctive Task	Differential Rewards	Small Group		Weinstein & Holzbach (1973)	X		

*Small Group = 2-5 members

indicate: (1) whether the rewards were equally or differentially divided; (2) whether the group size was small or large; and (3) the type of task examined in the study. Several studies are listed in multiple cells in both tables. This occurs because they are relevant to more than one comparison.

THE EFFECTS OF INDIVIDUAL AND GROUP INCENTIVES ON PERFORMANCE AND SATISFACTION

As indicated earlier, compensation experts maintain that pay and performance must be linked in order for pay to affect performance (Conrad, 1994; Dickinson & Gillette, 1993; Jensen & Murphy, 1990; Lawler, 1990; McAdams & Hawk, 1992; McNally, 1988). Moreover, these experts suggest that the stronger the link, the higher the performance. Individual incentives provide the strongest connection between performance and pay, because incentives are based solely on the performance of the individual. With group incentives, the worker's pay depends upon the group's productivity, and hence workers have less control over their earnings. Furthermore, that control decreases as the group size increases. As a result, performance may suffer accordingly.

Many of the preceding compensation experts have also reasoned

that individual incentive systems are more effective than group incentive systems. Dierks and McNally (1987) argue that group rewards decrease the performance of top performers because they see their earnings reduced by less productive group members. Poor performers, on the other hand, continue to perform below average because they benefit from the labor of others. Dickinson and Gillette (1993) note that this poor performer "free rider effect" probably becomes more pronounced as the size of the group increases. With larger groups there are more members to sustain the group's performance, and hence poor performers perceive that their rewards will not be significantly reduced by their own low productivity.

As discussed earlier, Blinder (1990) also states that incented performance is a function of the number of group members: Given the formula 1/n, with n equaling the number of group members, as "n" increases, performance decreases. Similarly, Lawler (1990) notes that as the group size increases, workers no longer feel that they can influence the productivity of the group and, as a result, do not perform as well. Mullen, Johnson, and Drake (1987) appeal to the "other-total ratio" to explain why workers in small groups out-perform those in larger ones. The other-total ratio is an algorithm derived from self-attention theory, and mathematically defined as "the number of people in the other subgroup divided by the sum of both the number of people in the other subgroup and the number of people in one's own self subgroup" (p. 144). The theory predicts that individuals will work harder when their other-total ratios are higher, that is, when they are part of a small subgroup of the organization. For example, if an employee works in an office of 20 employees and is on a project team with two other employees, his other-total ratio is .85 [17/(17+3)]. If the worker is part of an eight-member team, his other-total ratio is .60 [12/(12+8)]. Because the worker has greater "self-attention" in the small group, he would perform better.

Productivity is not the only concern when analyzing the effects of incentive systems; employee acceptance is critical to the success of a pay system as well. Moreover, Mawhinney (1984) has insightfully argued that organizational interveners have an ethical responsibility to evaluate employee satisfaction: "We propose to jointly improve productivity and quality of work life (job satisfaction). But we rarely measure satisfaction" (p. 27). "Unless the contingencies designed to improve productivity are patently positive (joy producing), some

technology for estimating the condition it produces in people must be employed'' (Mawhinney, 1984, p. 7). Employee reaction to incentive systems has been assessed primarily through surveys, and these data, as they relate to group incentive systems, were presented earlier.

Performance

Seven studies have compared the effects of individual and group incentives on performance, with groups ranging in size from two to twelve members (Allison, Silverstein, & Galante, 1992; Farr, 1976; Honeywell et al., 1997; London & Oldham, 1977; Roberts & Leary, 1990; Smoot, 1997; Stoneman & Dickinson, 1989). Farr (1976) examined the effectiveness of four types of pay on the performance of three-person groups: hourly pay, individual incentives, equally-distributed group incentives, and differentially-distributed group incentives. In the equal-distribution condition the incentives earned by the group were equally divided. In the differential-distribution condition, the highest performer received 50% of the available incentives, the middle performer 33%, and the lowest performer 17%. A between-group experimental design was used. Subjects sorted computer data cards that were punched with various combinations of holes. Both individual and group incentives resulted in significantly higher productivity than hourly pay. Individual and equally-distributed group incentives resulted in similar productivity, while differentially-distributed group incentives resulted in the highest productivity.

In a 1977 study, London and Oldham compared hourly pay, individual incentive pay and three types of group incentive pay using two-person groups. In the group incentive conditions, incentives were based on the average performance of the two performers, the performance of the high performer, or the performance of the low performer. In the latter two conditions, both group members received the amount of incentives earned by the high or low performer, respectively. The experimental design was a between group design, and the task consisted of sorting computer cards into piles based on the 12-hole pattern punched in each card. Productivity was comparable for the individual and high-performer group incentive conditions, and significantly greater for these two conditions than for the other pay conditions.

Smoot (1997) examined individual and group incentives with six three-member groups. Subjects were college students who assembled pop bead widgets when exposed to the following pay conditions: flat

rate, individual incentive, and group incentive. Three types of incentive pay scales were examined: linear, positively accelerating and negatively accelerating. In the linear condition, subjects earned the same amount of money for each widget, regardless of the number assembled. In the positively accelerating condition, the amount of the per piece incentive increased as production increased and, conversely, in the negatively accelerating condition, the amount decreased as production increased. Subjects were exposed to one type of pay scale under both individual and group pay conditions in a within-subject multiple-baseline design. Regardless of the type of pay scale, individual and group incentives increased productivity above that found with flat rate pay. Performance was comparable under individual and group incentives.

Reasoning that group incentives may be less effective in larger groups, Stoneman and Dickinson (1989) compared the effects of individual and group incentives with groups of two, four, five, and nine using an ABA experimental design. In this design each subject was exposed to individual incentives and group incentives in a group of a particular size (A = individual incentives and B = group incentives with N members). Subjects assembled parts made from bolts, nuts and washers. Individual performance was comparable under the two pay systems, regardless of group size.

Roberts and Leary (1990) replicated Stoneman and Dickinson (1989), comparing hourly pay with individual and group incentives for groups of two, four, and nine members. The design was a single-subject withdrawal design. In two related experiments, 46 college students assembled widgets made from pop beads during 15-minute work sessions. Subjects assembled more widgets when they received incentives than when they were paid hourly, but assembled a comparable number when they received individual and group incentives, again regardless of group size.

Allison et al. (1992) compared the performance of a group of 12 employees under four conditions: individual feedback with hourly pay, and individual feedback with individual, cooperative group or competitive group incentives. In the individual incentive condition, each subject received an incentive equal to p ($20.00) where p equaled the percentage of target behaviors performed by that subject. In the cooperative group incentive system, the worker's incentive was determined by multiplying $20.00 by the average percentage of target

behaviors completed by the group. In the competitive group condition, the total amount of available incentives ($200.00) was divided equally among the top three performers. Performance was better when staff received incentives, regardless of the type. The cooperative incentives produced the highest performance, but the differences between conditions were small. While a statistically significant difference was found between the cooperative and individual incentive condition, differences between the cooperative and competitive and between the competitive and individual conditions were not statistically significant.

Honeywell et al. (1997) examined the effects of individual and group incentives with two groups of ten, noting that the most common sized incentive group in work settings is ten (Peck, 1990). College students sorted pre-punched cards onto boards with corresponding wooden dowels. An alternating treatments design was used in which group and individual incentive pay were alternated during each successive 20-minute session for 14 sessions. Performance did not differ under group and individual incentives.

The results of the preceding studies have been consistent: All have found small group incentives to be at least as effective as individual incentives with groups of two to twelve. While London and Oldham (1977) reported that rewards based on average performance and divided equally were not as effective as individual incentives, this finding appears to be an anomaly. Thus, although the analyses presented earlier (Blinder, 1990; Dickinson & Gillette, 1993; Dierks & McNally, 1987; Lawler, 1990, Mullen, Johnson & Drake, 1987) predict that performance will be higher under individual incentives than group incentives and decrease as the size of the group increases, small group incentives appear to be as effective as individual incentives. This may well be due to the fact that in small groups workers can influence the group's productivity substantially, thereby markedly raising or lowering their own earnings. Therefore, the link between performance and pay is sufficiently preserved.

No well-controlled studies have examined larger groups, although two field studies have been reported. In these studies, each worker received an incentive that was based on the group's productivity, with the amount pro-rated based on the worker's hourly pay and hours worked (Campbell, 1952; Marriott, 1949). In Marriott (1949) the groups ranged in size from under ten to over fifty, and in Campbell (1952), from under twenty to over one hundred. In both, group productivity decreased as the size of the group increased.

Without further investigation, it is not possible to delineate the variables responsible for the discrepancies between the studies reviewed earlier and the two field studies, but they may include group size, length of exposure to the pay systems, the amount of the incentives, and/or differing types of social interactions. Nonetheless, the current research suggests that group incentives will sustain the performance of individuals when they are members of small groups, specifically, groups that range in size from two to twelve members.

Satisfaction

The current section reviews four studies that examined participant reactions to group incentives (Allison et al., 1992; Campbell, 1952; Farr, 1976; Honeywell et al., 1997). As noted by Mawhinney (1984), few researchers have measured such reactions.

In actual work settings, incentives are sometimes based on subjective performance appraisals by supervisors. In those situations it is not clear whether ratings of satisfaction and fairness reflect the worker's perceptions of the veracity of the appraisal or the features of the actual incentive system. In the studies described below, incentives were based on the actual performance of subjects. Thus, while it is not possible to identify with complete confidence the variables that controlled the verbal responses of subjects, the ratings cannot be attributed to subjective evaluations of performance.

Farr (1976) compared the effects of hourly pay, individual incentives and two types of group incentives (equally or differentially divided) on pay fairness and satisfaction with three-person groups. Pay fairness and satisfaction with one's own performance were assessed using 7-point Likert scales. A modified Job Description Index (Smith, Kendall, & Hulin, 1969) was used to measure satisfaction with the task, pay, the experimenter and other subjects. Subjects in the differential reward group were more satisfied with their fellow subjects than those in the other pay conditions; however, all other measures of satisfaction were comparable for subjects exposed to individual and both types of group incentives. Ratings of pay fairness were equivalent for individual and equally-distributed group incentives, with both perceived as fair. Differentially-distributed group incentives, however, were reported to be unfair. To summarize, individual and equally-distributed group incentives were rated similarly with respect to both

satisfaction and fairness, while differentially-distributed group incentives were found to be less fair than either.

Honeywell et al. (1997) probed the extent to which members of two ten-person groups found individual and equally-divided group incentives satisfying and demanding, using 5-point Likert rating scales. All subjects, regardless of how well they performed, rated the two incentive systems similarly on both factors. However, when asked which pay system they would choose to work under, high performers chose individual incentives while low performers chose group incentives. These data may reflect the fact that high performers earned more money when paid individual incentives while the reverse was true for low performers.

Allison et al. (1992) assessed reactions to individual incentives, group cooperative incentives and group competitive incentives using verbal ratings and behavioral choice. The 12 workers rated their satisfaction with the three types of pay on a 7-point Likert scale. In addition, after exposure to all incentive conditions, they were asked to choose the incentive system for the following week. Staff voted privately, and were told that a simple majority would be used to determine which pay condition would be implemented. Although the ratings of satisfaction were moderately high and comparable for the three types of incentives, all of the staff selected the group cooperative incentives for the final week of the study. Thus, while moderately satisfied with all types of incentive pay, these workers preferred the equally-divided group cooperative incentives when forced to choose among them.

Campbell (1952) analyzed the effects of incentives on employee satisfaction with intact work groups, ranging in size from under 20 to over 100. He also assessed whether workers could calculate the amount of their incentives, to determine if ''knowledge of results'' would affect their attitudes. The satisfaction of employees who could not calculate their earnings decreased as group size increased, while the satisfaction of those who could calculate their wages was not affected by group size. While the data are correlational, they suggest that such self-generated feedback, or what Lawler (1990) refers to as a clear ''line of sight,'' may influence worker satisfaction with large group incentives. Bettenhausen (1991), reviewing non-incented group performance, reported that ''A meta-analysis of eight US studies revealed that as work groups got larger, members were more likely to be dissatisfied . . . '' (p. 354). Campbell's data suggest that ''knowledge

of results'' or an understanding of the relation between performance and pay may mitigate decreases in satisfaction in larger groups.

The results of the preceding studies suggest that worker satisfaction with individual and equally-divided group incentives is, in general, comparable. However, in Honeywell et al. (1997) while high performers rated the two types of incentives similarly, all preferred individual incentives when asked to choose between them. These data may be of import to managers who desire a workplace where productivity and satisfaction are positively correlated. On the other hand, Allison et al.'s (1992) staff members also rated individual and group incentive systems similarly, but selected equally-divided group incentives as their subsequent pay method. The discrepancy between the results of these two studies may be due to differences in the amount earned by subjects when paid individual and group incentives. Honeywell et al.'s top performers earned more in the individual incentive condition. Because Allison et al. did not report individual data or earnings, it is not possible to determine how the individual and group incentives affected the pay of their subjects. If there were no discernible high and low performers, that is, if all staff members performed comparably, then their earnings would have been similar in the individual and cooperative group incentive conditions, eliminating the amount earned as a reason to prefer one over the other.

Finally, it should be noted that subjects in Farr's study (1976) found differentially-divided incentives to be less fair than either individual or equally-divided group incentives. This finding will be discussed further in the ''Incentive Distribution Method'' section.

THE EFFECTS OF INDIVIDUAL AND GROUP INCENTIVES ON SOCIAL INTERACTIONS

Although group interaction has been studied extensively (see Bettenhausen, 1991), the effects of group incentives on such interactions have not. With non-incented groups, interaction among group members has been found to affect performance. For example, Walsh, Henderson, and Deighton (1988) found that the amount of interaction among group members was positively related to the group's performance. Others have reported that group members who interacted more were more likely to complete their tasks (Hiltz, Johnson, & Turoff, 1986) and have a more accurate perception of their productivity within

the group (Ambrose & Kulik, 1988; Schnake & Drumler, 1987). Because group incentives are based on the group's productivity, members have a vested interest in how well others perform, and hence may initiate attempts to influence their performance. Group members may, for example, remind others that increases in productivity will raise pay, suggest how others can improve their performance, and praise and criticize the work of others. In turn, these interactions may influence productivity. Moreover, both the extent and nature of interactions evoked by group incentives are of interest, as positive ones can create a pleasant working environment, while negative ones can create a stressful one.

Zywiczynski, Thurkow, Vunovich, and Shimamune (1992) compared the effects of individual and group incentives on the social interactions of college students. Two groups of four subjects worked on crossword puzzles, sharing a dictionary. Group incentives increased the number of positive interactions, but did not change the number of negative ones. In contrast, Honeywell (personal communication, 1996) videotaped the interactions of two 10-member groups under individual and group incentive conditions and found no difference. The discrepancy may be due to the type of tasks used in the two studies. Zywiczynski et al.'s task required subjects to interact when sharing the dictionary, while subjects in Honeywell et al. could complete their card sorting task independently and without interaction. Results from Littlepage (1991) lend credence to this explanation. Littlepage examined the number of comments made by members of two-, five- and ten-person groups when performing an independent task and a shared task. Subjects made considerably more comments when working on the shared task. Clearly, more research is warranted.

THE EFFECTS OF INCENTIVE DISTRIBUTION METHODS ON PERFORMANCE AND SATISFACTION

Group incentives can be equally distributed to members or differentially divided based on a formula that considers the performance of the group and the individual's contribution to it. When group incentives are differentially distributed, the link between a worker's performance and pay is strengthened, and thus higher performance may occur. On the other hand, differential distribution methods may create intragroup competition and perceptions of unfairness if one member bene-

fits from the poorer performance of another and/or if the amount of the incentive does not accurately or reasonably reflect member contributions. For example, consider the situation where the top performer is awarded a large percentage of the available incentives. His performance may differ only slightly from that of the other members, yet his incentive is considerably higher. Moreover, another member of the group would benefit economically if the top performer did not perform as well. While competition might increase productivity, it may also have deleterious effects, as members may attempt to hinder the performance of others.

Performance

Three studies have investigated ways of dividing incentives among group members (Allison et al., 1992; Farr, 1976; Weinstein & Holzbach, 1973). Weinstein and Holzbach (1973) equally or differentially distributed rewards to members of 21 three-person groups. Subjects coded questionnaire responses onto standardized answer forms, and the group earned $.06 for every correctly coded questionnaire. In the equal reward condition, each member received one-third of the group's earnings, while in the differential reward condition, the highest performer received one-half, the second highest performer received one-third, and the lowest performer received one-sixth. Group performance was significantly greater with differential rewards than with equal rewards.

Farr (1976) extended Weinstein and Holzbach's study by examining the same group incentive distribution methods and comparing them with hourly pay and individual incentives. As indicated in a preceding section, individual and equally-divided rewards resulted in similar performance, while, consistent with Weinstein and Holzbach (1973), differentially-divided rewards resulted in the highest performance.

Allison et al. (1992) analyzed the effects of three incentive distribution systems on group member performance: individual, cooperative group incentives and competitive group incentives. In the cooperative group condition, a condition analogous to equally-divided rewards, each of the 12 employees received the same incentive, which was based on the performance of the total group. In the competitive group incentive condition, only the three best performers received an incentive, but the amount of the incentive was considerably higher than that

in the other pay conditions. Cooperative and competitive group rewards resulted in comparable performance.

In summary, differentially-divided rewards have been found to be more effective or as effective as equally-divided rewards. These results are not surprising because differentially-distributed rewards strengthen the association between an individual's performance and pay. On the other hand, a word of caution seems appropriate. The types of differential reward systems that have been examined to date have competitive features, and thus may have detrimental long-term effects. Over time, group members may come to hinder the performance of others in order to claim the top spot and, hence, the much greater reward. Moreover, if one group member consistently out-performs the others, the other group members may decrease their performance. These and other potential problems of competitive reward programs have been well addressed by Daniels (1989, 1994).

Abernathy (1996) has developed a unique differential incentive program that does not have competitive features. In this program, the total amount of money available for disbursement is based on group profitability measures. A specific portion of those monies is reserved for individual workers depending upon their current salary. The actual amount received is based on the worker's personal "scorecard," which reflects his or her performance. This program has several notable features. First, employee incentives are linked to organizational economic measures. Second, the amount of money available for incentives is dependent upon the group's performance, promoting cooperation. Third, because a proportion of the proceeds is reserved for each individual, workers are not vying against one another: A worker does not profit from another's misfortune. Finally, an individual's pay is linked to his or her performance by the personal scorecard. Although conceptually very sound, this type of differential reward program has yet to be experimentally investigated.

Satisfaction

As reported earlier, Farr's (1976) subjects found differentially-divided rewards to be less fair than either individual or equally-divided incentives. Similarly, when Allison et al.'s (1992) staff were allowed to choose cooperative or competitive group rewards, they unanimously selected the cooperative group rewards. These findings clearly indicate a preference for equally-distributed, as opposed to differentially-

distributed, group rewards. Thus, a pay system that offers equal pay for different performance is more appealing than one that offers substantially different pay for potentially small differences in performance. The competitive nature of differentially-distributed rewards may account for this preference, as Weinstein and Holzbach's (1973) subjects perceived that differentially-divided group rewards led to significantly greater competition than did equally-divided rewards.

Although differentially-divided rewards resulted in high performance, subjects reported that they were unfair and promoted competition. Equally-distributed incentives were found to be as effective as individual incentives, and were perceived as fair. Given these data, managers would be wise to favor equally-distributed group rewards, or differentially-divided group incentive programs that do not contain competitive contingencies, like the one offered by Abernathy (1996).

THE EFFECTS OF GROUP INCENTIVES AND TASK STRUCTURE ON PERFORMANCE

Steiner (1972) developed a taxonomy that classifies group tasks into four categories: disjunctive, conjunctive, additive and discretionary. With a disjunctive task, the group output is considered to be the best individual performance from the group, but individual efforts are not identified or rewarded. The group may assign the task to one member, or all may complete the same task with the group selecting the performance that constitutes its output. Conjunctive tasks differ in that all group members provide a unique contribution to the group's output, and thus the group can only perform as well as the lowest performer. The additive task also requires each member to participate, but each individual's performance is added together to produce an aggregate group output. One member's performance is not dependent upon another's. With a discretionary task, the group is permitted to determine what individual members will do and how individual contributions will be combined to form the group's output (i.e., assign the total task to one group member, assign different parts of the task to different group members, or ask each member to complete the same task, adding the results together).

Steiner's (1972) taxonomy has led to rich conceptualizations of how task structure may affect group performance (e.g., Littlepage, 1991; Shaw, 1981). Furthermore, it has been used to classify tasks in

several research studies (e.g., Frank & Anderson, 1971; Kerr & Bruun, 1983; Laughlin, 1980). However, most of the studies have examined the effects of other independent variables on tasks classified in this manner, and thus, at this point in time it is not clear how task structure affects non-incented group performance. In one notable study, Saavedra, Earley, and Van Dyne (1993) examined the complex relationships among four different interdependent task structures, individual versus group goals, and individual versus group feedback. In a laboratory setting, 118 three-person groups worked on a performance appraisal task. The experimental design consisted of a 4 (task structure: pooled, sequential, reciprocal, or team) 2 (individual versus group goals) 2 (individual or group feedback) crossed factorial design. According to Steiner's classification, the pooled task is an additive task, the sequential and reciprocal tasks, conjunctive tasks, and the team task, a discretionary task. With respect to task structure, the quality and quantity of performance were significantly lower in the sequential task condition than in the other task conditions. Moreover, the type of goals and feedback influenced performance within task conditions. For example, performance was highest for the reciprocal and team conditions when group goals and group feedback were provided, while performance was highest in the pooled condition when individual goals and feedback were provided. These results are particularly valuable for performance managers, and certainly merit further study. Furthermore, they suggest that the effectiveness of different types of incentive systems may well depend upon the way the group task is structured.

Despite the implications of the preceding study, few studies have examined how group incentives affect the performance of tasks that are structured differently. In one of the rare studies, Weinstein and Holzbach (1973) differentially or equally-divided incentives among three subjects who worked on an additive or conjunctive task. The dependent variable was the number of correctly coded questionnaires. In the additive task condition, each subject coded all of the questionnaire problems onto an answer form while in the conjunctive condition each coded one problem and then passed the questionnaire to another group member who coded the next problem. Subjects who performed the additive tasks were more productive, regardless of whether incentives were equally or differentially divided. Productivity was highest when the task was additive and rewards were differential-

ly distributed. These data are quite consistent with those reported by Saavedra et al. (1993) as those researchers found that (1) productivity was higher for additive (pooled) tasks than for sequential tasks, and (2) for additive tasks, productivity was higher when individual goals and feedback were provided than when group goals and feedback were provided. With respect to the latter results, differentially-divided rewards provide more individualized feedback than do equally-divided rewards.

Miroff et al. (1993) examined the effects of flat rate pay on the performance of additive, conjunctive and discretionary tasks, and the effects of equally-divided group incentives on the performance of additive and discretionary tasks. In the additive task conditions each subject completed his or her own widgets, made from pop beads. In the conjunctive task conditions the experimenter assigned different widget production tasks to specific group members such that each worker completed one portion of the widget. In the discretionary task conditions, subjects shared the production tasks, but devised their own division of labor. A combined single subject and group design was used, with five members in each of four groups. Two groups initially performed the conjunctive and additive tasks for several sessions under flat rate pay, and then received group incentives for the additive task. The other two groups performed the additive task, followed by the conjunctive and discretionary tasks under flat rate pay. Incentives were then provided for the performance of the discretionary task. Thus, group members received incentives for either the additive or discretionary task. Under flat rate pay, additive task performance was consistently higher than conjunctive or discretionary task performance. When incentives were provided for the performance of the additive (Groups 1 and 2) or discretionary (Groups 3 and 4) tasks, it was higher than it had been for any of the preceding tasks (additive, conjunctive or discretionary) under the flat rate pay. Moreover, in spite of the fact that the non-incented performance of the additive task was higher than the non-incented performance of the discretionary task, the incented performances did not differ.

In summary, Miroff et al. (1993) found that group incentives increased the performance of additive and discretionary tasks, and eliminated non-incented performance differences. Weinstein and Holzbach (1973), on the other hand, found that additive task performance was higher than conjunctive task performance when incentives were pro-

vided, regardless of whether the incentives were equally- or differentially-divided. Weinstein and Holzbach suggest that conjunctive tasks, in contrast to additive tasks, restrict group performance because constraints are placed on the performance of high performers–they can only be as productive as the least productive member of the group. Results from Saavedra et al. (1993) support this analysis as well.

CONCLUSIONS AND FUTURE RESEARCH

The effects of productivity-based group incentives have been analyzed in well-controlled laboratory and field studies. In all comparisons of group incentives and hourly pay, group incentives increased performance. In six of seven studies, they produced performance levels that were equal to or better than those produced by individual incentives (Allison et al., 1992; Farr, 1976; Honeywell et al., 1997; London & Oldham, 1977; Roberts & Leary, 1990; Stoneman & Dickinson, 1989). Moreover, satisfaction ratings were comparable for individual and group incentives in three studies that conducted such an assessment (Allison et al., 1992; Farr, 1976; Honeywell et al., 1997). However, it should be noted that in one (Honeywell et al., 1997), high performers expressed a preference for individual incentives when asked to choose between them, results that do require further investigation. Nonetheless, results indicate that small group incentives can produce high levels of performance and satisfaction.

Differentially-divided rewards were more effective than equally-divided rewards in two laboratory studies (Farr, 1976; Weinstein & Holzbach, 1973), while their effects were comparable in one field study (Allison et al., 1992). In all three studies, however, subjects reacted more negatively to differentially-divided rewards, perceiving them to be competitive and unfair. Thus the higher performance was accompanied by lower satisfaction. The effects of noncompetitive differentially-divided group incentives, the type proposed by Abernathy (1996), have yet to be experimentally examined. The latter type of rewards have great promise for group and team situations, and the field would benefit from an empirical demonstration of their effects on the performance and satisfaction of workers, as well as from comparisons of their effects with those of individual and competitively-based group incentives.

Two laboratory studies found group incentives to be equally effec-

tive with groups ranging in size from two to nine members (Roberts & Leary, 1990; Stoneman & Dickinson, 1989), while two field studies reported that large group productivity declined as group size increased (Campbell, 1952; Marriott, 1959). Clearly, group size may account for the differences, as may the length of exposure to the incentive system. Future studies should parametrically examine how equally-divided group incentives affect the protracted performance of groups with over ten members. Such research is admittedly difficult to conduct, given the number of subjects and financial resources that are required. However, simulated groups could be used in such studies, increasing the feasibility of such research. Results from the study of simulated groups have been shown to mimic the results of actual groups with certain independent variables and for certain types of tasks (e.g., Farr, 1976; Harcum & Badura, 1990; Hollingshead, McGrath, & O'Connor, 1993). Recently, computerized simulations of groups and group performance have been used to examine the effects of various independent variables on group performance, and show great promise (Mullen, Johnson, & Anthony, 1994; Weaver, Bowers, Salas, & Cannon-Bowers, 1995). Of particular relevance to the present suggestion that computer simulations be used to examine the effects of group incentives with groups of differing sizes, Mullen et al. (1994) successfully manipulated group size in a computerized simulation. In that study, subjects who believed that their sub-group constituted either 25% or 75% of the total group performed differently on a classification task.

The effects of group incentives on social interactions and on the performance of tasks that are structured differently both warrant further study as well. Two studies analyzed the effects of group incentives in conjunction with the type of work task the participants completed (Miroff et al., 1993; Weinstein & Holzbach, 1973). Both found that the incentives improved performance. In Miroff et al. (1993) productivity was comparable on additive and discretionary tasks when group members received incentives. Weinstein and Holzbach (1973) found performance to be higher when members performed an additive, rather than a conjunctive, task. Despite the similarity of these findings, there is not enough research to draw significant conclusions. However, the results reported by Saavedra et al. (1993), who studied the relationships among the type of task, goals and feedback on the performance of non-incented groups, revealed that individual versus group goals and feedback do influence the performance of tasks struc-

tured differently; findings that provide fertile ground for the study of the effects of different types of incentive systems on tasks that are structured differently.

Overall, the results of laboratory investigations are consistent with the findings of surveys of productivity-based group monetary incentive programs. Both have found that these pay systems increase productivity and satisfy workers. However, as is evident from this review, relatively few experimental investigations have examined the effects of group monetary incentives on the performance of groups that are of the size typically found in the work place. Moreover, in spite of the consistent findings, questions remain. For example, in most of the studies that examined groups of 5 to 10 workers, both individual and group feedback were provided along with the incentives. In contrast, in many organizations, only group feedback is available. Thus, future research should address the differential effects of individual and group feedback when group incentives are provided. Additionally, in studies that compared the relative effectiveness of group and individual incentives with groups of 5-12 members, distinct high and low performers were evident in only one (Honeywell et al., 1997). And, in that study, pay differentials between the two incentive systems were relatively small. When members perform comparably and/or their pay remains relatively constant when exposed to individual and group incentives, the consequences of performance do not differ, and, as a result, performance differences would not be expected. Thus, studies of the effects of group incentives when there are distinct high and low performers in the group and when pay differences between individual and group incentive conditions are greater than those that existed in the current studies are of particular import.

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ERRATUM

In the first paragraph of page 15 of the article by Mawhinney and Austin entitled "Speed and Accuracy of Data Analysts' Behavior Using Methods of Equal Interval Graphic Data Charts, Standard Celebration Charts, and Statistical Process Control Charts," that appeared in *Journal of Organizational Behavior Management*, Volume 18, Issue 4, the days during which interventions occurred for data sets By and Bz and B and Bx are incorrectly stated as follows: The intervention was a one week long token-based lottery that occurred during week three (days 15 through 19) for the day shift (By and Bz) and week four (days 20 through 21) for the evening shift (B and Bx). (For details see Fellows and Mawhinney, 1997.)

When corrected the sentence should read as follows:

The intervention was a one week long token-based lottery that occurred during week three (days 16 through 20) for the day shift (By and Bz) and week four (days 21 through 25) for the evening shift (B and Bx). (For details see Fellows and Mawhinney, 1997.)

Also, in the lower panel of Figure 5 page 28 of the same article, the first (left most) dashed vertical line that is supposed to divide baseline from intervention data points is incorrectly drawn. It appears to divide the data between weeks 17 and 18 when it should divide the data between weeks 18 and 19.

On page 10 of *JOBM* 19(1) the following sentence incorrectly states that Alyce Dickinson was elected director of the OBM Interest Group: "Nevertheless, when Alyce Dickinson was *elected* OBM Interest Group Director at the 1984 meetings in Nashville for the upcoming year (1985) those present at our meeting could have been counted on the hands of one in tact person" The correct sentence reads as follows:

"Nevertheless, at our 1984 meetings in Nashville when we learned that Alyce Dickinson had been appointed to serve as one of our OBM Interest Group program coordinators for 1985, those present at the meeting could have been counted on the fingers of one intact person."