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Budgeting effects and evaluation by self, peers, and superiors
with moderating effects of personal and social identity

Parker, Robert James, Ph.D.

Temple University, 1993

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BUDGETING EFFECTS AND EVALUATION BY SELF, PEERS, AND SUPERIORS
WITH MODERATING EFFECTS OF PERSONAL AND SOCIAL IDENTITY

Author

Robert J. Parker

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by

Robert J. Parker

August 1993

ABSTRACT

BUDGETING EFFECTS AND EVALUATION BY

SELF, PEERS, AND SUPERIORS

WITH MODERATING EFFECTS OF

PERSONAL AND SOCIAL IDENTITY

By Robert J. Parker

Doctor of Philosophy

Temple University 1993

Major Advisor: Dr. Penelope Greenberg

The study investigates psychological motivations to achieve budget goals. The study proposes that individuals seek to achieve budget goals to enhance self and social-esteem. Budget goals may represent internal standards of competency which individuals seek to surpass to increase self-esteem. Budgets also represent standards by which superiors and peers may evaluate individuals; consequently, individuals strive to reach budget to enhance social-esteem.

To test these ideas, the interaction between budget and identity orientation is examined. Individuals with strong social identities are theorized to be concerned about social evaluation and therefore strongly affected by budgets when peer or superior evaluation is present. Individuals with

strong personal identities are theorized to be concerned about self-evaluation. They may be strongly affected by budget goals regardless of the social evaluation context.

To examine the issues, a laboratory experiment was conducted. Student subjects were asked to decode computer cards during a timed session. The number of cards decoded is defined as performance, the dependent variable of the study. The experiment had a 2 x 2 x 2 design involving the following three manipulations: budget goal (present, absent); superior evaluation (present, absent); and peer evaluation (present, absent). Subjects also completed an Aspects of Identity Questionnaire to determine their identity orientation.

Results partially support the hypothesized relations between social evaluation and performance. In general, individuals with strong social identities are more affected by superior and peer evaluation than individuals with weak social identities.

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CHAPTER 1

INTRODUCTION

Budgeting serves three managerial functions: planning, control, and motivation (Ronen and Livingstone [1975]). The current study examines how budgets motivate employee behavior. As Tosi [1975] notes, budgets, by influencing motivation, affect performance since individual performance is a function of motivation and ability [p. 151]. Given a relationship between budgets, motivation, and performance, explaining how budgets affect motivation constitutes an important research issue for not only accounting but business in general.

Several accounting researchers, such as Ronen and Livingstone [1975], have attempted to develop models of budget motivation based upon expectancy theory. The theory proposes that individual motivation is a function of (among other things) the valences (rewards) associated with a successful outcome. As Ronen and Livingstone [1975] indicate, financial rewards, such as bonuses and pay raises, and career rewards, such as promotions, are among the more obvious valences in the workplace that motivate individuals to achieve budget.

The motivational effects of budgets do not stem entirely from organizational rewards involving money or career. Hofstede [1968], in his field study of budgeting in industrial plants, notes that budgets affect individual motivation even when the individual expects no organizational rewards (punishments) for reaching (not reaching) budget. As Ronen and Livingstone [1975] acknowledge, budgets motivate, in part, because achieving budget provides the opportunity to gain psychological rewards such as a sense of achievement. The current study attempts to develop a theoretical framework to explain how psychological rewards motivate individuals to pursue budget goals.

The current study develops its theoretical framework from a number of sources, including prior accounting research, goal setting theory, and social psychology. According to the proposed framework, budgets represent internal standards of competency which individuals attempt to surpass to increase self-esteem. Budgets also represent standards by which others may evaluate individual performance. To gain favorable evaluations from peers and superiors, i.e., to enhance social-esteem, individuals strive to achieve budget. To summarize, the psychological reward of achieving budget is positive self and social evaluation.

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To test the theoretical framework, the interaction between budget and identity orientation is examined. Prior research in psychology proposes that an individual's identity is based upon social and personal elements. Individuals with identities that are predominantly socially oriented are concerned with how others view them; consequently, the threat of evaluation by others may influence their performance in a budgetary context. If so, social identity orientation and budget interact. Individuals with identities that are predominantly personally oriented are concerned with inner, private assessments; consequently, their performance may be influenced by internal standards of competency which a budget goal may provide. If so, personal identity orientation and budget interact.

The current study also examines the related issue of how evaluation by superiors and peers affects performance in non-budgeting situations. Prior researchers report that the threat of evaluation by others increases performance but why this occurs is unclear. According to the theory proposed by the current study, individuals who expect evaluation increase performance to protect social-esteem. If so, individuals with strong social identities are more affected by evaluation threats, i.e., social identity interacts with evaluation.

To examine the issues, a laboratory experiment is conducted in which student subjects are given a simple task, decoding computer cards. The number of cards decoded during a timed session is defined as performance and is the dependent variable in the statistical analysis. The experiment has a 2 x 2 x 2 design involving the following three manipulations: budget goal (present, absent); superior evaluation (present, absent); and peer evaluation (present, absent). Subjects also completed a survey to assess their identity orientation.

The statistical results indicate that the proposed interactions between budget and identity orientation are not significant. A possible explanation for this is that the budget variable is not a significant factor in the experiment. The theory for the interactions assumes that budget condition affects performance.

The study's theoretical model concerning social evaluation effects is partially supported by the statistical results. Superior and peer evaluation each interact with social identity. As hypothesized, individuals with strong social identities are more affected by superior and peer evaluation than individuals with weak social identities.

These results may help management accountants better understand how evaluation influences individual performance within the organization. Management accountants are

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involved in the evaluation process. They often determine

how individual performance is measured and the standards

(such as budgets) by which performance is judged. An

understanding of how evaluation influences performance may

lead to increased effectiveness for managerial accountants

in their evaluation role.

CHAPTER 2

LITERATURE REVIEW

In the accounting literature, two theoretical
frameworks have been proposed to explain individual
motivation to achieve budget goals: agency theory and
expectancy theory. Both approaches have neglected the role
of psychological rewards in motivating budget performance.
In contrast, Hofstede [1968], using a human needs approach,
focuses on psychological rewards, particularly esteem
considerations. His ideas parallel those of several
researchers in the goal setting literature. Although
relatively few accounting researchers have used it, goal
setting theory represents a potentially rich source for
investigating budget motivation. The relevant accounting
and goal setting literature is discussed in detail in the
literature review.

In general, agency studies have neglected psychological
factors in their models of motivation (with the exception of
attitudes toward risk). The agency framework views agents,
i.e., employees, as economic entities who seek to maximize
their material welfare while minimizing effort. Arrow
[1985], in his review of agency theory, comments that agency
models focus almost exclusively on monetary rewards in

discussing employee motivation while ignoring other types of rewards such as socially mediated rewards. Demski and Feltham [1978], in their seminal article on agency theory and budgeting, acknowledge that their approach ignores non-financial incentives. Subsequent agency researchers investigated perquisites but continued to neglect psychological factors.

Expectancy theory represents another theoretical framework of employee motivation found in the accounting literature. Ronen and Livingstone [1975] were among the first accounting researchers to apply expectancy theory to budgeting. Their formulation of expectancy theory typifies the expectancy models found in later accounting studies (such as Rockness [1977], Ferris [1977], Dillard [1979], Jiambalvo [1979], and Ferris, Dillard and Nethercott [1980]). According to Ronen and Livingstone [1975], an individual's motivation is a function of "(1) his [her] expectations ["expectancy"] that the behavior will result in a specific outcome and (2) the sum of valences, i.e., personal utilities or satisfaction that he [she] derives from the outcome" [p.672]. Ronen and Livingstone [1975] identified two types of valences (rewards): extrinsic and intrinsic. Extrinsic rewards are rewards associated with the consequences of behavior such as promotions. Intrinsic rewards are found in the behavior itself. They include

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psychological rewards such as the valence "associated with successful performance of the task" [p.673]. Successful performance, i.e., achieving budget, generates feelings of competency.

While Ronen and Livingstone [1975] note the existence of psychological rewards in achieving budgets, they do not discuss them in detail. Subsequent expectancy studies exhibit similar limitations (e.g., Rockness [1977]).

Unlike the agency and expectancy studies, Hofstede [1968] focuses on psychological rewards. For theory, Hofstede [1968] relies on Maslow's Hierarchy of Basic Needs. Maslow [1954] argues that the individual has a hierarchy of needs that are satisfied in sequential order. The most basic needs, the needs for safety and physical maintenance, are satisfied first. Once satisfied, the individual seeks to satisfy the "higher" needs of affiliation, esteem, and finally, self actualization. Many needs can be satisfied by reaching budget goals at the workplace. For example, the need for physical security (food, safety, etc.) could be satiated if the individual reaches budget and gains organizational rewards [note 1].

Hofstede [1968] conducted a field study of budgeting at several industrial plants. He noted that budgets had motivational effects that were not related to organizational rewards such as promotions or pay increases. Based upon his

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interviews with workers, he reported that budget goals often were internalized by employees as standards for self-appraisal. For these employees, reaching budget provided a sense of achievement which increased self-esteem. Some employees also were motivated to achieve budget to gain favorable appraisals from others, i.e., to increase "esteem from others."

In the current study, the theoretical framework of Hofstede [1968] will be expanded by drawing upon the goal setting literature. In the goal setting studies, found primarily in the psychology and management literatures, the relationship between the assigning of goals and individual motivation has been extensively explored. Given the obvious parallels between assigned goals and budgets, goal setting theory represents a potentially rich theoretical source for examining the motivation effects of budgets. Tosi [1975] notes the potential contributions of goal setting to budgeting. After reviewing both budgeting studies and goal setting studies, he "concluded that the 'motivating effect' of the budget derives from simply the fact that it [the budget] is a statement of explicit goals" [p.150].

In their review of goal setting theory, Locke and Latham [1990] identify its core hypothesis: goals affect task performance [p. 16, intro]. The personal goals of the individual directly affect the individual's performance in

work tasks. Research evidence also supports a relationship between assigned goals and performance (Locke and Latham [1990, p.29-30]). Both in laboratory and field settings, individuals who are given goals by experimenters or supervisors tend to accept such goals as personal goals and expend effort to achieve the goals. In general, individuals with assigned goals outperform individuals who are not given goals. Further, individuals assigned difficult goals outperform individuals assigned easy goals.

Relatively few accounting researchers have used goal setting theory in budgeting studies. Chow [1983] examined the relationship between performance and goal difficulty and found similar results to the goal setting studies. Hirst [1987] examined moderating variables in the relationship between assigned goals and performance. Merchant and Manzoni [1989] conducted a field study of how firms set the achievability of budget goals.

Hirst [1987] argues that accounting researchers are justified in relying on goal setting theory to examine budgeting issues. The types of goals found in the goal setting studies are similar to the budget goals found in the accounting literature. Also, the results reported in the goal setting studies have been found to be highly robust and replicable.

An important contribution of the goal setting
literature to budgeting is evidence regarding the existence
of psychological rewards in motivating budget performance.
In goal setting studies, laboratory subjects have attempted
to reach assigned goals when financial (and career)
incentives to do so have been absent. Goals influence
performance regardless of financial and career rewards which
suggests the existence of psychological rewards.

Without extrinsic rewards such as money, why do
individuals attempt to reach assigned goals? Hofstede
[1968] suggests that esteem considerations motivate
individuals. Yet Hofstede's [1968] conclusion could be
considered as only preliminary, since it is based upon
unstructured interviews with employees. In the goal setting
literature, the motivation question has been investigated
without resolution. As Locke and Latham [1990] note,
assigned goals are usually accepted as personal goals but
why this occurs is unclear.

Meyer, Schacht-Cole, and Gellatly [1988] theorize that
assigned goals are accepted because they represent
evaluation standards. Assigned goals provide standards for
the individual to self-evaluate and for the supervisor
(experimenter) to evaluate the individual. The individual
seeks to achieve the budget goal, i.e., accepts the budget
as a personal goal, to secure favorable evaluation from self

and from the supervisor (experimenter). This view is similar to the esteem approach proposed by Hofstede [1968]. Meyer, Schacht-Cole, and Gellatly [1988] did not empirically test their proposition or offer extensive theoretical justification since their experiment was designed to test other relationships.

The current paper further developes the theoretical framework suggested by Hofstede [1968] and Meyer, Schacht-Cole, and Gellatly [1988]. As will be discussed in more detail in subsequent pages, assigned goals are accepted by individuals because they represent evaluation standards. Individuals seek favorable self-evaluation to enhance self-esteem and favorable evaluations from the supervisor (experimenter) to bolster social-esteem. Before discussing how budget goals induce concerns about esteem, self and social-esteem must be discussed.

Self and Social-Esteem

Several psychology researchers have suggested that human behavior is regulated by concerns about two selves, a private self and a public self. (See Leary, Barnes, and Griebel [1986], and Barnes et al. [1988] for reviews of this literature.) As Schlenker [1985] argues, each individual has two audiences: self (private self) and others (public self). Associated with private self are concerns about

self-esteem. For example, individuals would like to view themselves as intelligent, competent, and well adjusted. In evaluative contexts, concerns about self-esteem may cause apprehension and lead to increased motivation. As noted by Leary, Barnes, Griebel, Mason, and McCormack [1987], "Among personality and social psychologists, the proposition that people are motivated to maintain and enhance their self-esteem has achieved the status of an axiom" [p.304]. Self-esteem is based primarily upon the internalized standards of the individual. Social-esteem involves how others view the individual. For example, the individual would like others to view him/her as intelligent, competent, and well adjusted. The public self of the individual seeks the approval of others. As was the case with self-esteem, in evaluative contexts, concerns about social-esteem may cause apprehension and lead to increased motivation.

As Barnes et al. [1988] note, prior studies have demonstrated that situational factors arouse concerns for self and/or social-esteem. The current study proposes that budget goals induce concerns about social-esteem via evaluation apprehension while inducing concerns about self-esteem via self-evaluation.

Evaluation Apprehension

The evaluation apprehension literature originated in the social facilitation studies of social psychology. Researchers found that, in their laboratory experiments, the presence of others usually "facilitated" (increased) individual production. Cottrell [1968] theorized that the increased drive originated in subject apprehension about being evaluated by others. Later studies support this viewpoint. (See literature review of Geen and Gange [1977].)

Several psychology researchers argue that evaluation by others represents a threat to social-esteem (Leary et al. [1987]; Barnes et al. [1988]). These studies also report that evaluation by others increases anxiety. Other studies have demonstrated that evaluation by others may result in increased performance (White, Mitchell, and Bell [1977]; Shalley, Oldham, and Porac [1987]).

White, Mitchell, and Bell [1977] investigated the relationship between evaluation apprehension and goal setting. They theorized that the goal setting effects found by prior researchers might be attributable to subject apprehension over potential evaluation by the supervisor (experimenter). In laboratory and field studies of goal setting, "the subjects know or expect that their performance will be evaluated by the experimenter" [p. 666]. To gain a

favorable evaluation from the experimenter, subjects strive to reach assigned goals.

In White, Mitchell, and Bell [1977], student subjects sorted index cards in a laboratory setting. The number of cards sorted, a performance measure, was the primary dependent variable. The two independent variables were experimenter evaluation and the existence of assigned goals. Each variable had separate and independent effects on performance. Subjects who were told that their performance would be evaluated outperformed subjects in non-evaluation groups (where subject anonymity was maintained). Groups given goals outperformed groups without goals. No interaction occurred between the variables; consequently, White, Mitchell, and Bell [1977] conclude that while performance is affected by the threat of evaluation, goal setting effects are not attributable to evaluation.

Accepting the theoretical arguments of White, Mitchell, and Bell [1977], the current study proposes that goal setting effects found by prior researchers are attributable, in part, to evaluation apprehension. The results of White, Mitchell, and Bell [1977] do not support this proposition because of flaws in their instructions to subjects. Subjects in the evaluation condition were told that the experimenter would "carefully evaluate your proficiency at doing this task by comparing your level of output with that

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of others who work on this project" [p.667]. The comparison of individual output with that of others is not the same as comparison with goals. The current study retests the role of evaluation apprehension in goal setting with more appropriate instructions.

While White, Mitchell, and Bell [1977] investigated evaluation apprehension arising from experimenter evaluation, Jackson and Zedeck [1982] investigated evaluation apprehension arising from peer evaluation. Jackson and Zedeck [1982] predicted that an individual would increase performance if the individual believes that peers would know the individual's performance. Since peer evaluation represents a threat to social-esteem, the current study also proposes that peer evaluation influences performance.

In Jackson and Zedeck [1982], student subjects performed tasks in a laboratory setting. In the experimental group, subjects were led to believe that individual performance would be publicly posted on a blackboard. In the control group, no mention of posting was made. Experimental groups outperformed control groups, although the difference was not statistically significant. One of the limitations in the experimental design was that the effect of peer evaluation was not isolated. Subjects in the experimental group probably expected that both

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experimenter and peers would know their performance. Subjects in the control group probably expected that the experimenter would know their performance. A comparison of the two groups' performance tests the incremental effect of peer evaluation given experimenter evaluation. In the current study, the peer effect will be tested separately.

As mentioned, Jackson and Zedeck [1982] found that the incremental power of peer evaluation was not statistically significant. Several possibilities exist to explain this result. A saturation effect may have occurred regarding social-esteem concerns. The threat to social-esteem posed by experimenter evaluation may have maximized social-esteem concerns so that the additional threat of peer evaluation had no impact. Another possible explanation for the nonsignificant results is that evaluation may have no impact if the peers are not known to the subject. In Jackson and Zedeck [1982], 263 students from introductory psychology classes participated in the experiment in groups of three. Students at a large university in introductory courses are unlikely to personally know many of their classmates. In a group of three, the probability that a student will know either of the other two students is low.

Several case studies in business settings have found that public posting of performance affects performance but, as with Jackson and Zedeck [1982], the effect of peer

evaluation was not isolated. Among these case studies are
Newby and Robinson [1983], Latham and Baldes [1975], and
Komaki, Barwick, and Scott [1978].

Self-Evaluation

To review, the current paper proposes two reasons why
individuals attempt to reach budget goals: (1) threat of
evaluation by supervisor (experimenter) and peers; and (2),
concerns about self-evaluation, which the current section
discusses.

Festinger [1954] was among the founders of social
comparsion theory in social psychology. Central to this
theory is the self-concept, i.e., the individual's feelings
of self-worth and self-evaluation regarding abilities,
opinions and values. The individual's self-concept is
formed by comparing individual abilities, opinions, and
values with those of others. The self-concept is
"relativistic since it depends on [sic] comparison with
others" (Suls [1977, p. 1]). As will be discussed in
greater detail in subsequent pages, individuals often
associate assigned goals (budgets) with perceptions of the
average performance of others; consequently, assigned goals
(budgets) become evaluation standards in the social
comparison process. Festinger [1954] also proposes that
individuals have a drive not only to evaluate their

abilities via social comparison but also to appear better than others. Individuals attempt to outperform others for ego enhancement.

The ideas of Bandura [1977, p. 130] are similar, although he does not acknowledge Festinger [1954]. Bandura [1977] argues that individuals seek positive self-evaluation by meeting internal standards of adequacy. Selection of internal standards often depends upon social comparison, i.e., the individual judges self by comparing personal performance with that of others.

Chung and Vickery [1976] found that subjects given normative information, i.e., information about others' performance, outperformed others. Mitchell, Rothman, and Liden [1985] report similar results. They theorized that the social comparison effects of Festinger [1954] and Bandura [1977] may be responsible for the performance effects of normative information.

Extending these findings, Meyer and Gellatly [1988] theorized that assigned goals are viewed as normative information and as such, assigned goals become internal standards of competency which individuals seek to surpass. In their first experiment, Meyer and Gellatly [1988] found that assigned goals influenced subject perceptions of performance norms, i.e., perceptions of how much the average subject could produce. According to Meyer and Gellatly

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[1988], many subjects assume that assigned goals are selected by the experimenter (supervisor) on the basis of average performance. In their second experiment, subjects were given both assigned goals and normative information, both of which had independent effects on performance. Locke and Latham [1990] interpret these results as indicating that assigned goals are effective, in part, because they suggest performance norms. They also theorized that assigned goals have an "authority" effect independent of the norm effect: "Assigned goals affected personal goals independently of norms, indicating that there may be other factors involved in the assigning of goals that makes them effective (e.g., authority as such)" [p. 72].

The current paper assumes that assigned goals affect performance, in part, because goals are viewed as normative information that is internalized as a standard of competency. Assigned goals also are effective because of subject apprehension over supervisor (experimenter) evaluation - a type of authority effect. Meyer and Gellatly [1988] did not isolate the separate effects of self-evaluation and supervisor evaluation. The current study attempts to isolate each effect and expands the theoretical discussion by introducing the moderating variables of self and social identity orientation [note 2].

Social and Personal Identity Orientation

As discussed previously, several psychology researchers theorize that human behavior is regulated by concerns about two selves, a private self and a public self. Researchers also propose that individuals differ in their orientations toward private and public selves (Cheek and Briggs [1982]; Greenwald and Breckler [1985]; Barnes et al. [1988]). Individuals with strong social identities are primarily concerned with the social self, i.e., how others view them. Individuals with strong personal identities are primarily concerned with the private self, i.e., meeting internal standards. As Barnes et al. [1988] demonstrates, identity orientation influences stress reactions to threats to self and social-esteem. For individuals with strong social identities, threats to social-esteem cause high anxiety, whereas for individuals with strong personal identities, threats to self-esteem cause high anxiety.

The current study extends Barnes et al. [1988] by proposing that identity orientation is a moderating variable in the relationship between threats to self and social-esteem and budget performance. As discussed more fully in the hypothesis section, the magnitude of the threat to each type of esteem can be varied in budgeting situations. Individuals may perform differently according to their identity orientation and which type of esteem is most

threatened. For example, if evaluation by the supervisor (experimenter) is emphasized (a threat to social-esteem), individuals with strong social identities may increase performance.

Barnes et al. [1988] report that identity orientation is a moderating variable in the relation between anxiety and threats to self and social-esteem. The rationale for extending the anxiety results to performance is based partly upon intuitive logic. Individuals who respond to esteem threats with strong anxiety may be motivated to perform well. However, as Weick [1983] indicates, anxiety can be counterproductive. At very high levels of "arousal," additional anxiety decreases performance.

White, Mitchell, and Bell [1977] provide limited evidence that the increased anxiety resulting from performing under budgets does not result in decreased performance. In their laboratory experiment, subjects given goals felt more performance "pressure" than subjects without assigned goals. Subjects with goals also outperformed the others. This suggests that the stress caused by assigning goals is positively related to performance.

Summary

To summarize the theoretical framework of the current paper, individuals accept assigned goals (budget goals) as

personal goals because of: (1) concerns over evaluation by supervisor (experimenter); and (2), concerns over self-evaluation with the budget representing a standard of competency. Evaluation by others represents a threat to social-esteem; accordingly, in an evaluative situation, individuals with strong social identities may outperform individuals with weak social identities. Self-evaluation represents a threat to self-esteem; consequently, given a context involving self-evaluation, individuals with strong personal identities may outperform individuals with weak personal identities. Specific hypotheses incorporating these ideas appear in the next chapter.

CHAPTER 3

THEORETICAL DEVELOPMENT

The theoretical model of the current study appears below. Discussion of the terms and the related hypotheses follow.

$$PERF = ABIL + GOAL + SUP + PEER + PERS*GOAL + SOC*GOAL*SUP$$
$$+ SOC*GOAL*PEER + SOC*SUP + SOC*PEER$$

PERF   performance

ABIL   ability

GOAL   budget goal   (absent, present)

SUP   superior evaluation   (absent, present)

PEER   peer evaluation (absent, present)

PERS   personal identity orientation

SOC   social identity orientation

The above model indicates that performance is a function of (among other things) three main effects: budget condition (GOAL), superior evaluation (SUP), and peer evaluation (PEER). As discussed in the literature review, prior researchers have found evidence supporting budget goal and superior evaluation effects. Attempts to find a peer evaluation effect in a laboratory setting have not been

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successful. (See discussion of Jackson and Zedeck [1982] in the literature review.) One of the contributions of the current study is examining peer evaluation with an improved methodology.

The current study examines the budget and evaluation effects primarily to understand what causes them. As discussed in the literature review, theoretical explanations for the budget goal effect have not been developed. As will be discussed, the studies (few in number) that examine superior and peer evaluation do not offer explanations for the effects.

The identity orientation interactions in the model test the theoretical explanations proposed by the study. As discussed in detail later in this chapter, concerns about self and social-esteem may motivate individuals who are given budgets or expect evaluation by others. If so, individuals with strong social or personal identities will be more affected by budgets or evaluation than individuals with weak social or personal identities, i.e., identity orientation will interact with budget and external evaluation. Detailed hypotheses involving the interactions appear subsequently in this chapter.

Main Effects -- Budget and Evaluation Hypotheses

One of the tenets of goal setting research is that individuals with goals outperform individuals without them. This proposition is retested by the current study:

H1   Individuals given budget goals will outperform individuals given instructions of do your best.

As discussed in the literature review, what causes the budget goal effect is unclear. Examining the interactions between budget goal and identity orientation may clarify this issue. The interactions are discussed in the next section.

In addition to a budget effect, evaluation effects resulting from superior and peer evaluation also are hypothesized.

H2   Individuals who expect to be evaluated by superiors will outperform individuals who do not expect the evaluation.

White, Mitchell, and Bell [1977] report evidence indicating that evaluation effects occur both in goal setting and non-goal setting situations. However, they do not develop a theoretical explanation for the results. As will be discussed, the current paper offers an explanation which is tested by examining the interactions between superior evaluation and social identity.

H3   Individuals who expect to be evaluated by their peers will outperform individuals who do not expect the evaluation.

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Jackson and Zedeck [1982] hypothesized a peer effect but did not find support for it. The proposition is retested in the current study with an improved methodology. Jackson and Zedeck [1982] also did not develop a theoretical argument for the peer effect. The current study attempts to do so and tests it by examining the interaction of peer evaluation and social identity.

Interactions -- Budget Goal

As discussed in the literature review, concerns about self and social-esteem may be responsible for the budget goal effects found by previous researchers. This argument is developed more fully in this section. First, the relationship between budgets and self-esteem is discussed.

As indicated in the literature review, individuals strive for positive self-evaluation to enhance self-esteem. In a performance context, self-evaluation often is based upon perceptions of how others perform. Budget goals may be used to form these perceptions. If so, individuals will strive to reach budget goals to achieve positive self-evaluation.

Individuals with strong personal identities may be more concerned about self-evaluation than individuals with weak personal identities. As discussed in the literature review, individuals with strong personal identities are concerned

about the private self and internally generated standards.
If the budget is viewed as a measure of how others perform,
the budget will be accepted as a relevant standard for self-
evaluation; consequently, individuals with strong personal
identities may react strongly to budgets. In a budget
situation, individuals with strong personal identities will
outperform individuals with weak personal identities. In
other words, personal identity interacts with budget goal.
Confirmation of the following hypothesis would support the
theoretical framework proposed by the current paper. (The
relevant variables in the theoretical model appear in
parenthesis.)

    H4 The budget goal effect (predicted in H1) will be
larger for individuals with strong personal identities than
individuals with weak personal identities.   (GOAL*PERS)

The above hypothesis is based upon concerns about self-
esteem and is relevant whether external evaluation is
present or absent. Social-esteem considerations may
contribute to the budget effect when external evaluation is
present. The existence of a goal implies that the goal will
be used by others to evaluate the individual. The budget,
by providing an evaluative standard, increases the threat to
social-esteem posed by external evaluation. As discussed in
the literature review, individuals with strong social
identities may be particularly sensitive to this type of
threat. These individuals are highly concerned with how

others view them; consequently, they may react strongly to budget goals when external evaluation is present. Given budget goals and external evaluation, individuals with strong social identities may outperform individuals with weak social identities, i.e., social identity interacts with budget goal (when external evaluation is present).

The current study examines two forms of external evaluation: superior and peer. An interaction between social identity and budget goal is hypothesized for both types of external evaluation:

H5 Assuming superior evaluation, the budget goal effect will be larger for individuals with strong social identities than individuals with weak social identities. (GOAL*SOC*SUP)

H6 Assuming peer evaluation, the budget goal effect will be larger for individuals with strong social identities than individuals with weak social identities. (GOAL*SOC*PEER)

Interactions -- Superior and Peer Evaluations

The threat of evaluations by others, whether superiors or peers, represents a threat to social-esteem. As discussed, individuals with strong social identities may be more concerned with this threat than individuals with weak social identities. If so, external evaluation interacts with social identity. The related hypotheses follow:

H7 The superior evaluation effect (predicted in H2) will be larger for individuals with strong social identities than individuals with weak social identities. (SOC*SUP)

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H8 The peer evaluation effect (predicted in H3) will be larger for individuals with strong social identities than individuals with weak social identities. (SOC*PEER)

To test the preceding hypotheses, a laboratory experiment was conducted. The experimental design is discussed in the next chapter.

CHAPTER 4

METHODOLOGY

The current study conducts a laboratory experiment in which the primary dependent variable is task performance. The experiment has a 2 (budget condition) x 2 (experimenter evaluation) x 2 (peer evaluation) factorial design (see figure one). For the budget condition factor, the two treatments are: no budget with instructions of do your best, and an assigned budget goal. The other independent variables involve evaluation by others: experimenter evaluation (present, absent), and peer evaluation (present, absent). Experimenter evaluation proxies for supervisor evaluation at the workplace. Peer evaluation proxies for co-worker evaluation at the workplace. Two moderating variables are theorized to influence task performance: social and personal identity orientation.

Task

Subjects decode computer cards. Each card has 8 prepunched holes that represent 4 different alphabetic characters. Subjects are given a decoding key that matches the position of the hole on the card (by row and column) with the correct letter. Performance is defined as the

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number of cards which are correctly decoded [note 3]. Chow [1983] and Rockness [1977] used a similar task to investigate the relation between budget goals and performance. Both Chow [1983] and Rockness [1977] argue that the task simulates assembly line work in producing small computers, where, as part of the production process, workers must verify the location of integrated circuits on circuit boards.

For concerns about self and social-esteem to influence subject behavior, subjects must view task performance as ego involved. Barnes et al. [1988] told subjects that their test measured intelligence, which is overtly ego threatening. Leary et al. [1987] used a similar approach. Leary, Barnes, and Griebel [1986] informed subjects that their test measured "personal and social adjustment." In the current study, to heighten ego involvment, subjects were told that task performance is based, in part, on visual recognition skills and memory ability.

Besides motivation, ability is an important factor in task performance. Since cell sizes are relatively small, randomization of ability may not occur. To overcome this problem, ability is statistically controlled. Performance during a trial production period (in which experimental manipulations are absent) is defined as ability. In analyzing performance during the subsequent experimental

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sessions, ability is considered an independent variable that affects performance. As described in the statistical analysis section, treating ability as a covariate in analysis of covariance (ANCOVA) accomplishes this objective.

Subjects

Subjects were undergraduate students enrolled in a large urban university in the Northeast United States. All were enrolled in accounting courses. Almost all were accounting majors in their junior or senior years. Subjects received course credit for participating in the experiment. Prior to the actual experiment, subjects completed the AIQ (Aspects of Identity Questionnaire, described below) to determine their identity orientation.

Aspects of Identity Questionnaire

The AIQ (Cheek [1982]) asks respondents to rate the importance of 21 items to the individual's "sense of who you are." The AIQ has two subscales corresponding to the two identity orientations. The social identity score reflects how important social considerations are to self-identity. For example, individuals with a strong social identity rate the following items as important to their sense of identity: group membership, attractiveness to others, reputation, and popularity. The personal identity score measures how important personal considerations are to self-identity.

Individuals with a strong personal identity rate the following items as important: personal emotions and feelings, personal thoughts and ideas, personal hopes and goals for the future.

Barnes et al. [1988] review prior use of the AIQ which indicates that the scale has interitem reliability and construct validity [note 4]. In Barnes et al. [1988], the Cronbach alpha is .73 for the personal identity subscale and .82 for the social identity subscale.

Procedures

The experiment was conducted during class time as part of course requirements. The class instructor aided in the administration of the experiment. Students received homework or quiz grade credit for participating. Students had the option of not participating and doing other work for course credit; however, no one selected this option.

Preliminary procedures were the same for all subjects regardless of experimental group. At the beginning of class, the experimenter explained that he was conducting dissertation research and that the class instructor was involved in the research. The purpose of the experiment was explained as an investigation of the relationship between task performance, ability, and individual characteristics. All comments regarding the experiment were made according to

a prescribed script so that subjects in different classes received uniform information.

Subjects were given questionnaires requesting background information and the AIQ items. After the questionnaires were completed, each subject was given a folder with the experimental materials. Within the folder appeared additional information about the experiment's objectives. Detailed instructions concerning the decoding task and practice cards also were provided. Subjects had approximately ten minutes to read the instructions, learn how to decode, and practice decoding cards.

Following the learning session, subjects participated in two timed practice sessions. Subjects were told that the objective of these sessions was to give them additional practice. Each session was four minutes. The number of cards decoded during the second practice session was used as a measure of ability.

After the second practice session, subjects were told to read the instructions for the final session. The final session is the experimental session. Each of the eight groups in figure one were given unique instructions that contained the experimental manipulations. The instructions for each group are discussed subsequently.

Experimental Manipulations

Half the experimental groups, groups 1 - 4, were not given budget goals (see figure one). The subjects were informed in their written instructions to "do your best to decode as many cards as possible." Across groups 1 - 4, the budget condition remained constant while the evaluative context varied. Subjects in group one performed the task anonymously. They were informed that neither the instructor nor the experimenter would know their identity. Only the subject would know his/her performance. In group two, the threat of superior evaluation existed. Subjects were instructed to place their names on the answer sheet for the final session so that their individual performance could be reviewed by the experimenter and the instructor.

In group three, the threat of peer evaluation without superior evaluation existed. The written instructions to the final session informed the students that neither the experimenter nor the instructor would know their performance. However, their classroom peers would know their performance. After the final session, a student volunteer would place their names and scores on the blackboard so that individuals could compare their relative performance. While this occurred, the experimenter and the instructor would leave the room so that they would not know

the results. Before returning to the room, the results would be erased.

In group four, the threat of both peer and superior evaluation existed. Subjects were told that the results of the final session would be posted on the blackboard by the experimenter and the instructor; consequently, both their peers and the experimenter/instructor would know their individual performance.

Whereas subjects in groups 1 - 4 received instructions of "do your best," subjects in groups 5 - 8 were given a "budget goal" of 44 cards to be decoded during the final session (see figure one). Instructions regarding superior and peer evaluation remained the same. For example, subjects in group five were given the budget goal and informed that their results were anonymous.

The budget goal of 44 cards was established in a pilot study. Forty-eight students in an accounting class were instructed to "do your best to decode as many cards as possible." Students were instructed to place their names on the results but were not given any information about possible evaluation. Approximately 25% of the subjects decoded 44 or more cards. The 44 card goal was chosen to represent a moderately difficult goal, a goal that could be achieved by most individuals with strong effort. Goal setting studies have found that moderately difficult goals

maximize performance. "Easy" goals lead to comparatively poor performance. Extremely difficult goals are not accepted by individuals and hence also lead to poor performance [note 5].

After the experimental session, subjects in every group completed a questionnaire containing manipulation checks. Subjects were asked to identify who they had believed would know their performance. To control for possible contamination, subjects were also asked whether they had discussed the experiment with prior participants.

Statistical Analysis

The data is analyzed using analysis of covariance (ANCOVA), a technique similar to analysis of variance (ANOVA). As previously described, the primary dependent variable, task performance, is based upon the number of cards correctly decoded during the experimental session. The independent variables are qualitative. Given a quantitative dependent variable and qualitative independent variables, ANOVA is an appropriate technique. ANCOVA, a related approach, is appropriate if an additional independent variable exists that is quantitative and is not experimentally controlled. In the current study, ability fulfills these requirements and will be used as a covariate in ANCOVA. Using ability as a covariate statistically

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controls its effect on performance. This isolates the
effects of the other independent variables on performance.

The complete statistical model appears below:

PERF = ABIL + GOAL + SUP + PEER + PERS*GOAL + SOC*GOAL*SUP +

SOC*GOAL*PEER + SOC*SUP + SOC*PEER + (PERS + SOC

+ SOC*GOAL + GOAL*SUP + GOAL*PEER)

The preceding model is an extension of the theoretical
model presented on page 24. The terms within the
parenthesis have been added to the theoretical model so that
theorized terms can be statistically assessed. For example,
several hypotheses propose interactions involving personal
and social identity (PERS and SOC). To statistically assess
the interactions, PERS and SOC must appear as main effects
in the model. The current study does not theorize that
either personal or social identity has a main effect; they
appear as main effects only for statistical purposes.
Similarly, since SOC*GOAL*SUP and SOC*GOAL*PEER are
hypothesized (H5 and H6), related second order terms appear
in the above model within the parenthesis (SOC*GOAL,
GOAL*SUP, GOAL*PEER).

Besides using ANCOVA to analyze the data, the current
study calculates and compares the mean performance of

selected experimental groups. T-tests for differences between means are performed.

Limitations

The primary limitations are those inherent in laboratory experiments in the social sciences. Experiments are often criticized for creating artificial conditions that are unrealistic of the "real" world. Detractors argue that laboratory results are applicable only to the narrow environment created in the experiment. A particular concern in the current study is that results may be task specific. The current study also may have limitations arising from using student subjects. Student subjects may not be representative of employees in business organizations.

Evidence in the goal setting literature suggests that these limitations should not jeopardize the validity of the current study. Latham and Lee [1986], in their review of the literature, report that laboratory results involving goal setting effects closely parallel the results found in field settings of actual organizations. They argue that results are generalizable from laboratory to field settings. Locke and Latham [1990], in their review of the literature, report that goal setting effects are generalizable across not only laboratory and field settings but also tasks and subjects, including student subjects [chap. 2].

CHAPTER 5

RESULTS

There were 254 subjects who participated in the
experiment. The 254 sample reduced to 204 after eliminating
all subjects who failed a manipulation check concerning
external evaluation. In the post-test questionnaire,
subjects were asked whether they had believed that the
experimenter and/or their peers would be able to identify
their personal performance. Subjects who incorrectly
answered this question were eliminated from the sample.

Figure two summarizes information concerning the
experimental groups. For each group, figure two indicates
number of subjects, mean ABIL (ability), sample standard
deviation of PERF (performance, the dependent variable) and
mean PERF, both adjusted and unadjusted for covariates.
(Adjustments to means are discussed later in this chapter.)

As previously mentioned, ANCOVA, among other methods,
is used to analyze the data. ANCOVA has a number of
statistical assumptions regarding the dependent variable.
One of the more important assumptions is that, for each
ANCOVA cell, the dependent variable is normally distributed.
Another important assumption of ANCOVA with regard to the
dependent variable is that cells have equality of variance

(homoscedasticity). Both of these assumptions appear to hold across the experimental groups. Tests of the assumptions are discussed in note six.

To assess interitem reliability of the AIQ, Cronbach alpha was calculated for the personal and social identity subscales. For the 204 subjects, alpha equals .79 for the social identity subscale and .76 for the personal identity subscale. The alpha values correspond to values reported by prior researchers (Barnes et al. [1988]; Leary, Wheeler, and Jenkins [1986]; Penner and Wymer [1983]).

To analyze the effect of the experimental variables on performance, the statistical model presented on page 39 is run using ANCOVA. Results appear in table one. To assess the statistical significance of individual variables, F values using partial sum of squares, as reported in the table, are relevant. These indicate that ABIL (ability) has the most significant effect on performance. This result parallels that of Chow [1983].

Interpreting the F values of variables other than ABIL is difficult given the number and complexity of the interactions. For example, in the statistical model, GOAL (budget goal), is a main effect and appears in several interactions. Because of the interactions, determining the significance of the GOAL main effect is difficult. The F value associated with GOAL is not relevant.

To circumvent the limitations of table one, additional statistical approaches are used to examine the hypotheses. They are discussed in conjunction with the hypotheses.

Budget Hypothesis

Hypothesis one predicts a budget effect. According to H1, individuals with budgets outperform individuals without budgets. As discussed, because of interactions, examining the F value for GOAL in table one is not appropriate for testing the budget effect. To test H1, comparisons of mean performance are performed. In the experiment, about half the subjects were given a budget while the other half were not. The mean performance of each group is compared using t-tests.

To compare means, mean performance is adjusted for the covariates appearing in the statistical model (page 39). The covariates include ABIL (ability), PERS (personal identity), SOC (social identity), and their interactions. Another adjustment to mean performance results from the unbalanced design present in the experiment. Mean performance reported by the study is a "least-squares" mean which adjusts for unequal cell sizes.

According to H1, the budget group should outperform the no budget group. For the no budget group, adjusted mean performance is 38.1 while for the budget group, the mean is

38.7. The p value for the hypothesized difference is .128, indicating a marginal effect. On average, the budget condition has only a marginal effect on performance.

Examining the average effect has limitations in that the budget effect could vary across evaluative contexts. As figure two indicates, the budget variable is manipulated across four evaluative contexts: no external evaluation (G1, G5); superior evaluation (G2, G6); peer evaluation (G3, G7); and both superior and peer evaluation (G4, G8). Figure two reveals the adjusted mean performance (**P) for each group so that comparisons of budget/no budget groups can be made within each of the four evaluative contexts. The difference between budget/no budget groups is significant in only one case, that of peer evaluation (G3, G7). In this case, individuals with a budget significantly outperform individuals without a budget (p = .030).

External Evaluation Hypotheses

Hypothesis two predicts a superior evaluation effect. According to H2, individuals expecting superior evaluation outperform individuals who do not expect it. The statistical evidence does not support this proposition. The adjusted mean performance for individuals expecting superior evaluation is 38.2 while the mean for those not expecting

superior evaluation is larger, 38.6. This result contradicts the hypothesis.

Hypothesis three predicts a peer evaluation effect, i.e., individuals expecting peer evaluation outperform individuals who do not expect it. The statistical evidence supports this hypothesis. The adjusted mean performance for individuals expecting peer review is 39.4, while for individuals not expecting evaluation, the mean is 37.3. The difference in means has a p value of .001.

Hypotheses Involving Budget Goal Interactions

Hypothesis four examines the relationship between budget goal and personal identity. According to H4, individuals with strong personal identities are more affected by a budget than individuals with weak personal identities, i.e., personal identity and budget goal interact (PERS*GOAL). Table one provides an F value for PERS*GOAL; however, the presence of third order interactions involving GOAL complicates the interpretation of the F value.

To circumvent this problem, a simpler model, without third order interactions, is applied to specific pairs of the experimental groups. As discussed, the budget goal effect appears in four evaluative contexts in the experimental design. Within each evaluative condition, one experimental group receives a budget while the related group

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does not. Subjects in the two groups are combined and
ANCOVA is performed. The significance of PERS*GOAL can be
determined since a simpler ANCOVA model can be used to
analyze the data.

The model used to examine PERS*GOAL appears below. The
model is based upon the theoretical model (page 24) but is
simpler since only two experimental groups are involved:

PERF = ABIL + GOAL + SOC + SOC*GOAL + PERS + PERS*GOAL +
     PERS*SOC

    PERF performance, number of cards decoded in last
           session

    ABIL ability, number of cards decoded in trial session

    GOAL budget goal (present, absent)

    PERS personal identity orientation

    SOC   social identity orientation

ABIL adjusts for differences in ability across individuals.
The model also contains GOAL, PERS, SOC, and all possible
two way interactions between them.

Statistical results indicate that, in all evaluative
contexts, the interaction between budget goal and personal
identity is insignificant; consequently, H4 is unsupported.
Table two demonstrates that PERS*GOAL is insignificant in
the case of no external evaluation (G1, G5). Table three

indicates that, in the case of superior evaluation (G2, G6), PERS*GOAL is insignificant. Table four reveals the same result in the case of peer evaluation (G3, G7) while table five reveals the same result assuming both peer and superior evaluation (G4, G8).

Besides predicting an interaction between budget and personal identity, the current paper also hypothesizes an interaction between budget and social identity when external evaluation exists (H5, H6). The statistical evidence does not support this assertion. H5 predicts an interaction between social identity and budget in the context of superior evaluation (SOC*GOAL*SUP). As table one indicates, SOC*GOAL*SUP is insignificant (p = .222). H6 predicts an interaction between social identity and budget in the context of peer evaluation (SOC*GOAL*PEER). Table one indicates that SOC*GOAL*PEER is insignificant (p = .297).

Hypotheses with Superior Evaluation Interactions

Hypothesis seven predicts that individuals with strong social identities are more affected by superior evaluation than individuals with weak social identities, i.e., social identity and superior evaluation interact (SOC*SUP). Table one presents an F value for SOC*SUP; however, given the presence of third order interactions involving SOC and SUP, the F value for SOC*SUP is difficult to interpret.

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To overcome this problem, a simpler ANCOVA model, without third order interactions, is applied to selected pairs of the experimental groups. (This approach parallels that used to investigate PERS*GOAL.) To examine the interaction between social identity and superior evaluation within a pair of groups, one group must receive superior evaluation while the other does not. Both groups should be in the same budget condition. While several pairs of experimental groups fit this criteria, the most meaningful examinations of SOC*SUP occur when peer evaluation is absent (G1, G2; G5, G6). Hypothesis eight proposes an interaction between social identity and peer evaluation; consequently, the presence of peer evaluation could confound the assessment of an interaction between social identity and superior evaluation.

The ANCOVA model used to examine the interaction between social identity and superior evaluation appears below. The model is based upon the theoretical model but is simpler since only two groups are examined.

PERF = ABIL + SUP + SOC + SOC*SUP + PERS + PERS*SUP + SOC*PERS

    PERF   performance, number of cards decoded in last session

    ABIL   ability, number of cards decoded in trial session

SUP   superior evaluation (absent, present)

SOC   social identity orientation

PERS personal identity orientation

The preceding model was applied to subjects in G1 and
G2 with the results appearing in table six. The interaction
between social identity and superior evaluation (SOC*SUP) is
marginally significant (p = .112).

To investigate the issue further, the above model was
rerun using a dichotomous measure of social identity. SOC
scores above the sample median, 24, are defined as high
("strong") while SOC scores below 24 are defined as low
("weak"). The following model was applied to subjects in G1
and G2:

PERF = ABIL + SUP + DS + DS*SUP + PERS + PERS*SUP + PERS*DS

    DS   represents dichotomous SOC

The results appear in table seven. Mean performance in
the table is adjusted for covariates and unequal cell sizes.
Assuming no external evaluation, individuals with weak and
strong social identities exhibit similar performance.
However, in the case of superior evaluation, individuals
with strong social identities outperform those with weak
social identities (p = .053). This suggests a synergistic

interaction between SUP and SOC as predicted by H7. The plot in table eight also suggests this.

In the case of no budget, G1 and G2, the interaction of SOC and SUP receives limited support. In the case of a budget goal, G5 and G6, the evidence supporting the interaction is stronger. Table nine indictes that, for subjects in G5 and G6, SOC*SUP is significant at the .001 level. Using a dichotomous measure of social identity, table ten suggests that the interaction is synergistic as predicted. The plot in table eleven also suggests this.

To summarize the current section, the statistical evidence indicates an interaction between social identity and superior evaluation as predicted by H7. In the case of no budget, the support is marginal, while in the case of a budget, the evidence is stronger.

Hypotheses Involving Peer Evaluation Interactions

Hypothesis eight proposes that individuals with strong social identities are more affected by peer evaluation than individuals with weak social identities, i.e., social identity interacts with peer evaluation (SOC*PEER). Table one presents an F value for SOC*PEER but the problem of higher order terms in the model is present.

To circumvent this problem, a simpler ANCOVA model, without third order interactions, is applied to selected

pairs of the experimental groups. (This approach parallels that used to investigate superior evaluation interactions.) To examine the interaction between social identity and peer evaluation within a pair of groups, one group must receive peer evaluation while the other does not. Both groups should be in the same budget condition. While several pairs of experimental groups fit this criteria, the most meaningful examinations of SOC*PEER occur when superior evaluation is absent (G1, G3; G5, G7). Hypothesis seven proposes an interaction between social identity and superior evaluation; consequently, the presence of superior evaluation could confound the assessment of an interaction between social identity and peer evaluation.

The ANCOVA model used to examine the interaction between social identity and peer evaluation appears below:

PERF = ABIL + PEER + SOC + SOC*PEER + PERS + PERS*PEER + PERS*SOC

      PERF   performance, number of cards decoded in last session

      ABIL   ability, number of cards decoded in trial session

      PEER   peer evaluation (absent, present)

      PERS   personal identity orientation

      SOC   social identity orientation

The preceding model is applied to subjects in G1 and G3 (no budget condition). Table twelve indicates that the interaction between social identity and peer evaluation (SOC*PEER) is statistically insignificant (p = .981). The preceding model is also applied to subjects in G5 and G7 (budget goal condition). Table thirteen indicates that SOC*PEER is statistically significant (p = .006). Table fourteen appears to confirm this finding using a dichotomous measure of social identity. The interaction appears synergistic as predicted by H8. The plot in table fifteen also suggests this.

To summarize, the interaction between social identity and peer evaluation appears to be dependent upon the presence of a budget goal. In the case of no budget, the interaction is insignificant; however, when a budget exists, the interaction is highly significant.

Although not hypothesized, personal identity appears to be an important factor in explaining the peer evaluation effect. In the case of peer evaluation with no superior evaluation, the interaction between personal identity and peer evaluation (PERS*PEER) is statistically significant across both budget conditions. For G1 and G3 (no budget), PERS*PEER is significant at the .054 level (table 12). Table sixteen, using a dichotomous measure of PERS, appears to confirm this. Individuals with strong personal

identities are significantly more affected by peer evaluation than individuals with weak personal identities. Table seventeen plots the interaction between peer evaluation and personal identity.

In the case of a budget goal, PERS*PEER also is significant. For G5 and G7 (budget goal), the PEER*PERS interaction is significant at the .017 level (table 13). Table eighteen and the plot in table nineteen demonstrate that individuals with strong personal identities are more affected by peer evaluation than those with weak personal identities.

Comparison of Superior and Peer Evaluation

To understand superior and peer evaluation more fully, the two evaluation effects are compared. As discussed in the next paragraphs, the statistical evidence suggests that peer evaluation groups outperform superior evaluation groups. Also, peer evaluation has a greater effect on individuals with strong personal identities than does superior evaluation.

In comparing superior and peer evaluation, the most meaningful comparisons, in the framework of figure two, are: G2 versus G3; and G6 versus G7. The comparison of G2 versus G3, superior evaluation versus peer evaluation in the context of no budget, is discussed first.

As figure two indicates, in the case of no budget, subjects who expect peer evaluation (G3) outperform subjects who expect superior evaluation (G2). The p value for the difference in adjusted means is .085. In an attempt to understand why this result occurred, the following ANCOVA model was applied to individuals in G2 and G3:

PERF = ABIL + EVAL + SOC + SOC*EVAL + PERS + PERS*EVAL +
    SOC*PERS

    EVAL   represents external evaluation which has two
           levels: superior evaluation, peer evaluation.

Results appear in table twenty. The interaction of personal identity and external evaluation, PERS*EVAL, is marginally significant (p = .071). Table twenty-one, using a dichotomous measure of personal identity, indicates that peer evaluation has a significantly greater effect on individuals with strong personal identities than does superior evaluation.

The comparison of peer and superior evaluation in the case of a budget is similar. As figure two indicates, subjects expecting peer evaluation (G7) outperform subjects expecting superior evaluation (G6). The p value for the difference in adjusted means is .001. Applying ANCOVA to the subjects in G6 and G7 reveals that the interaction

between personal identity and external evaluation, PERS*EVAL, is marginally significant (p = .140, table 22). As table twenty-three indicates using a dichotomous measure of personal identity, the peer evaluation effect is significantly stronger than superior evaluation in the case of strong personal identity.

To summarize the comparison of superior and peer evaluation, peer evaluation appears to have the stronger effect on performance in both budget conditions. This difference could stem from the greater effect that peer evaluation has on individuals with strong personal identities. An interpretation of these findings is presented in the next chapter.

CHAPTER 6

CONCLUSION

The primary objective of the current study is to
understand what causes budget goal and evaluation effects.
According to the proposed theory, the desire to protect self
and social-esteem motivates individuals in goal and
evaluative contexts. Measures of identity orientation are
theorized to capture differences between individuals in
their susceptibility to the esteem threats posed by budgets
and evaluation. Tests of the proposed theory involve
examining the interactions between identity orientation and
budget/evaluation factors. The statistical results
regarding the interactions are discussed, in detail, in the
prior chapter. The current chapter attempts to summarize
and interpret the results. The findings regarding the
budget goal effect are discussed first followed by a
discussion of the evaluation effects.

Budget Goal Effect

In the experiment, in general, the budget goal
manipulation did not result in a budget effect. As
discussed in the results section, the budget goal
manipulation significantly affects performance in only one

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evaluative context, peer evaluation. In the three other evaluative contexts tested in the experiment (no evaluation, superior evaluation, peer and superior evaluation), the budget variable is not significant. Given the significance of the budget effect in prior studies, the lack of significance in the current study suggests that the study's budget manipulation did not operate in the same manner as previous studies. Examining the interaction results of the current study to understand the budget results of prior studies may not be productive.

Why a budget effect did not occur in the current study is unclear. A number of possible explanations exist including feedback difficulties. Prior research demonstrates that feedback and goal effects are interdependent (see Locke and Latham [1991, chapter 8]). Individuals with goals need feedback, i.e., information about their performance, to adjust their effort so that goals can be reached. If feedback is missing or difficult to understand, the goal effect may not occur. In the current experiment, performance during the trial session served the feedback function. Individuals could monitor the relationship between effort and performance in the trial session and use this information to estimate how much effort would be required in the final session to reach budget. The feedback of the trial session may have been diminished by

the use of different time intervals in the trial and final
sessions. The trial session lasted four minutes while the
final session lasted twelve minutes, three times as long.
The difference in time intervals may have deterred some
subjects from using feedback information from the trial
session.

Another possible explanation of the budget results is
the language of the instructions. Subjects in the no budget
condition were instructed to "do your best to correctly
decode as many cards as possible." This wording may be
"stronger," i.e., elicit greater effort, than the wording
found in prior goal setting studies. For example, Jackson
and Zedeck [1982], cited in the literature review, had the
following instructions for subjects in the no budget
condition: "try to do your best on this task - just do the
best you can" [p. 761]. This instruction may elicit less
effort than instructions to decode as many cards as
possible. Many goal effect studies do not provide the
subjects with any special instructions in the no budget
condition. White, Mitchell, and Bell [1977], cited in the
literature review, apparently did not give any special
instructions to subjects in the no budget condition.
Subjects were told simply to do the experimental task, sort
cards.

Future studies could investigate the issue of whether wording makes a difference in the no goal condition. Results may indicate that the wording in the curent study, decode as many cards as possible, represents a relatively powerful non-numerical goal.

Evaluation Effects

The statistical results demonstrate some support for the theorized explanation of superior evaluation. According to the current study, the superior evaluation effect results from individuals attempting to protect social-esteem. Because superior evaluation may threaten social-esteem, individuals with strong social identities may be more affected by superior evaluation, i.e., social identity and superior evaluation interact (H7). The interaction is marginally significant ($p = .112$) in the case of no budget (G1, G2) and highly significant ($p = .001$) in the case of a budget (G5, G6).

Peer evaluation results are more complex and difficult to interpret. As predicted in H3, peer evaluation significantly increases performance. The current paper also theorizes that social identity and peer evaluation interact (H8). The interaction is significant ($p = .006$) in a budget context (G5, G7) but insignificant in the case of no budget

(G1, G3). Why the difference between budget conditions exists is unclear.

Although not theorized, peer evaluation has a significant interaction with personal identity. In the case of no budget (G1 and G3), the interaction is significant at the .054 level while in the budget condition (G5 and G7), the significance level is .017. A possible explanation for this result is that the peer evaluation manipulation in the experiment contains two apprehension effects: (1) apprehension about what peers may think of the individual's performance; (2) self-evaluation apprehension concerning how the individual ranks compared to others in the group. In the experiment, individuals received information about their relative performance since all scores were posted. This information may pose a threat to self-esteem which could result in a significant interaction between personal identity and peer evaluation. Future research could attempt to disentangle the two potential apprehension effects.

Among the subjects in the experiment, peer evaluation exhibits a stronger effect on performance than does superior evaluation. As discussed in the prior chapter, individuals with strong personal identities are more affected by peer evaluation than by superior evaluation. This result again may reflect the possibility that the peer evaluation

manipulation of the experiment poses a strong threat to self-esteem.

Contributions

The current study attempts to develop a theoretical understanding of how budgets and evaluation influence performance within social groups such as business organizations. Such an understanding could aid management accountants who are involved in the overlapping areas of budgeting and performance evaluation. Management accountants need to be aware of the motivational forces behind budget goals and performance evaluation.

To develop a theoretical framework, the current study draws heavily upon psychology literature. The concepts of personal and social identity orientation are used to try to explain task performance. Apparently, this represents a new application of the concepts. The results involving social identity suggest that identity orientation may be useful in explaining certain dimensions of individual performance.

Another contribution of the study involves the finding of a peer evaluation effect and the presentation of possible explanations for it. Jackson and Zedeck [1982] predicted a peer evaluation effect but did not find evidence supporting the effect and did not develop a theoretical explanation for it. The current study, by improving the methodolgoy, finds

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significant results. The methodology of the current study could be used to further investigate peer evaluation and related issues.

As an example of a related issue, several field studies have indicated that public posting of employee performance increases performance. Why the results occur is unclear. Isolating the effect of posting from other confounding effects (such as feedback, training, etc.) is difficult in a field study. The results of the current study, although preliminary, suggest that both social and self-esteem factors may be contributing to the posting effect observed in the field studies.

NOTES

     1 Hofstede [1968] attempts to integrate the ideas of
Maslow [1954] within an expectancy framework. Budgets
provide the opportunity to gain valences related to
fulfilling basic needs. For this reason, Hofstede [1968]
might be considered an expectancy study. However, the
current paper does not classify his study as such.
Hofstede's [1968] discussion of expectancy theory is brief
and he does not integrate it extensively with the needs
approach of Maslow [1954]. For example, Hofstede [1968]
does not integrate the expectancy concept with need based
motivation. Hofstede's [1968] ideas regarding the role of
basic needs in budget motivation do not rely on expectancy
theory.

     2 Meyer and Gellatly [1988] theorized that normative
information affects performance via: (1) the individual's
desire to appear competent; and (2), expectancy. According
to the expectancy model, individual motivation to reach
assigned goals will be high given a high probability
(expectancy) that the goal can be reached. If subjects
believe that assigned goals are based upon normative
information, i.e., information about the average performance
of others, subjects may believe that the assigned goal is
reachable; consequently, subjects will be highly motivated.
Meyer and Gellatly [1988] do not disentangle this effect
from the motivation to appear competent. Assuming both
motivational factors are valid, separating them would be
difficult.
     The current study proposes that the expectancy effect
is less relevant. Harrell and Stahl [1984] performed a
budgeting experiment using the expectancy framework. They
found that potential rewards for reaching budget goals were
a "much greater" motivational factor than expectancy.
Further, the current paper theorizes that the relationship
between rewards and expectancy differs for the psychological
rewards of appearing competent to self and others. A budget
goal is not a dichotomous measure of competency in the sense
that achieving it indicates competency while not achieving
it indicates incompetency. Missing a budget goal by a
relatively small margin has psychological rewards compared
to missing budget by a relatively large margin. In the case
of extrinsic rewards, the relationship between motivation
and expectancy may be far stronger. For example, with a

budget bonus, missing the budget by a small or large margin has the same result - no bonus. If the individual believes that he/she can not reach budget, the individual may not exert effort to achieve the extrinsic reward, the bonus.

3 Performance is measured in physical quantities rather than dollars. As discussed in the methodology section, the experimental budget goals also are expressed in physical quantities (number of cards to be decoded). As Horngren and Foster [1991] note, management accountants may measure performance in dollars or physical quantities [Chap. 13]. Budgets also may be expressed in dollars or physical units [Chap. 6].

4 In their review of prior studies using the AIQ, Barnes et al. [1988] cite the following: Cheek [1982]; Cheek and Briggs [1982]; Cheek and Hogan [1983]; Leary, Wheeler, and Jenkins [1986]; Penner and Wymer [1983].

5 Chow [1983] also selected a moderately difficult goal which Chow termed as "tight but reasonably attainable." The goal was based upon pre-experiment trials in which no goals were given to the subjects. Chow chose the goal based upon a 25% cutoff point.

6 An important assumption of ANCOVA is that, for each cell, the dependent variable is normally distributed. The Shapiro-Wilk statistic, W, can be used to test the normality assumption with small samples. With the Shapiro-Wilk statistic, the null hypothesis is that the sample is derived from a population that is normally distributed. The values of W range from zero to one with values near zero indicating a rejection of the null hypothesis. Figure two presents W statistics and their p values for each of the experimental groups. Apparently, the normality assumption is valid for all groups.
Another important assumption of ANCOVA with regard to the dependent variable is that cells have equality of variance (homoscedasticity). To test this assumption, the F max procedure developed by Hartley [1950] was performed. The F max statistic is a ratio of cell variances: the variance of the cell with the largest sample variance divided by the variance of the cell with the smallest variance. The null hypothesis is that the variances are equal. If true, equality of variances will be true for all cells. In the study, G10 has the largest sample variance, 119.2, while G2 has the smallest variance, 49.8. The G10/G2 ratio is 2.39. From the Hartley's F max table, the critical value for a 5% significance test is approximately 3.12.

(Assuming eight independent cells with an average of 31
subjects each.) Since 2.39 is less than the critical value,
the null hypothesis can not be rejected. The
homoscedasticity assumption in the study appears to hold.

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Figure One

Experimental Design

External Evaluation	Peer Evaluation			
	No		Yes	
Budget Condition	Superior Eval.		Superior Eval.	
	No	Yes	No	Yes
No Budget Do Your Best Instructions	G1	G2	G3	G4
Budget Goal	G5	G6	G7	G8

*   To simplify presentation, figure one shows only variables theorized to have a direct relationship with the dependent variable, performance. The social and personal identity variables are not shown. They are theorized to interact with the variables indicated above.

Figure Two

Experimental Results

External Evaluation	Peer Evaluation			
	No		Yes	
	Superior Eval.		Superior Eval.	
Budget Condition	No	Yes	No	Yes
No Budget Do Your Best Instructions	G1 n=25 *ABIL=10.8 *PERF=35.6 **P=37.2 s=9.5 W=.99 (p=.98)	G2 n=25 *ABIL=10.8 *PERF=35.9 **P=37.7 s=7.1 W=.96 (p=.47)	G3 n=25 *ABIL=10.9 *PERF=37.4 **P=39.2 s=9.9 W=.98 (p=.92)	G4 n=33 *ABIL=12.0 *PERF=40.1 **P=38.3 s=10.9 W=.98 (p=.69)
Budget Goal	G5 n=27 *ABIL=11.3 *PERF=36.8 **P=36.6 s=10.5 W=.94 (p=.15)	G6 n=29 *ABIL=11.5 *PERF=38.4 **P=37.7 s=8.9 W=.96 (p=.45)	G7 n=22 *ABIL=12.1 *PERF=42.8 **P=41.3 s=9.4 W=.95 (p=.41)	G8 n=18 *ABIL=12.3 *PERF=41.3 **P=38.9 s=7.9 W=.93 (p=.26)

*ABIL mean performance, trial session
*PERF mean performance, final session, unadjusted
**P   mean performance, final session, adjusted for
       covariates
s   sample standard deviation for performance
W   Shapiro-Wilk statistic
p   p values for Shapiro-Wilk statistic given null
       hypothesis that population distribution is normal

APPENDIX B

TABLES

Table 1

Ancova Using All Subjects

Dependent Variable: PERF   R-square .8568

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	14	15980.9	1141.5	81.0	.0001
Error	189	2670.9	14.1		
Total	203	18651.9			

Source	DF	Sum of Squares	F value	Pr > F
ABIL	1	14140.2	1000.58	.001
GOAL	1	73.9	5.23	.023
SUP	1	57.2	4.05	.046
PEER	1	21.7	1.53	.217
PERS*GOAL	1	55.1	3.90	.050
SOC*GOAL*SUP	1	21.2	1.50	.222
SOC*GOAL*PEER	1	15.5	1.10	.297
SOC*SUP	1	51.9	3.67	.057
SOC*PEER	1	6.0	0.43	.515
PERS	1	86.4	6.11	.014
SOC	1	3.3	0.24	.628
SOC*GOAL	1	18.1	1.28	.260
GOAL*SUP	1	22.4	1.58	.210
GOAL*PEER	1	8.5	0.60	.440

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Table 2

Ancova Using Subjects in G1 and G5

Dependent Variable: PERF   R-square .9085

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	4600.3	657.2	62.6	.0001
Error	44	463.4	10.5		
Total	51	5063.7			

Source	DF	Sum of Squares	F value	Pr > F
ABIL	1	4214.8	400.21	.001
GOAL	1	1.4	0.13	.717
SOC	1	40.0	3.80	.058
SOC*GOAL	1	28.1	2.67	.110
PERS	1	38.1	3.62	.064
PERS*GOAL	1	20.3	1.93	.172
SOC*PERS	1	54.9	5.21	.027

Table 3

Ancova Using Subjects in G2 and G6

Dependent Variable: PERF   R-square   .8215

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	2861.6	408.8	30.3	.0001
Error	46	621.7	13.5		
Total	53	3483.3			

Source	DF	Sum of Squares	F value	Pr > F
ABIL	1	2736.19	202.46	.001
GOAL	1	20.97	1.55	.219
SOC	1	29.39	2.17	.147
SOC*GOAL	1	3.46	0.26	.615
PERS	1	9.03	0.67	.418
PERS*GOAL	1	14.84	1.10	.300
SOC*PERS	1	19.30	1.43	.238

Table 4

Ancova Using Subjects in G3 and G7

Dependent Variable: PERF   R-square .8703

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	3973.2	567.6	37.3	.0001
Error	39	592.0	15.2		
Total	46	4565.2			

Source	DF	Sum of Squares	F value	Pr > F
ABIL	1	3358.3	221.25	.001
GOAL	1	12.2	0.80	.376
SOC	1	1.2	0.08	.782
SOC*GOAL	1	12.0	0.79	.380
PERS	1	2.7	0.18	.674
PERS*GOAL	1	5.8	0.38	.540
SOC*PERS	1	0.9	0.06	.814

Table 5

Ancova Using Subjects in G4 and G8

Dependent Variable: PERF   R-square   .8923

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	4354.4	622.1	51.0	.0001
Error	43	525.3	12.2		
Total	50	4879.7			

Source	DF	Sum of Squares	F value	Pr > F
ABIL	1	3286.0	268.98	.001
GOAL	1	50.5	4.14	.048
SOC	1	20.0	1.64	.207
SOC*GOAL	1	29.2	2.39	.130
PERS	1	10.2	0.83	.367
PERS*GOAL	1	19.1	1.56	.218
SOC*PERS	1	22.1	1.81	.186

Table 6

Ancova Using Subjects in G1 and G2

Dependent Variable: PERF   R-square   .8540

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	2862.8	409.0	35.3	.0001
Error	42	489.3	11.6		
Total	49	3352.1			

Source	DF	Sum of Squares	F value	Pr > F
ABIL	1	2731.9	234.50	.001
SUP	1	10.6	0.91	.346
SOC	1	3.7	0.32	.577
SOC*SUP	1	30.7	2.63	.112
PERS	1	0.1	0.01	.994
PERS*SUP	1	0.1	0.01	.994
SOC*PERS	1	2.7	0.23	.631

Table 7

Mean Performance of Subjects in G1 and G2

by Social Identity

EXTERNAL EVALUATION SOCIAL IDENTITY	No External Evaluation (B1)	Superior Evaluation (B2)
Weak (D1)	36.4	35.2
Strong (D2)	36.3	37.8

Mean performance for PERF as adjusted for covariates

Weak social identity defined as SOC < 24

Strong social identity defined as SOC > 24

PERF = ABIL + SUP + PERS + PERS*SUP + DS + DS*SUP + DS*PERS

n= 45

Comparison of Cell Means

Superior effect for weak SOC: (B2,D1) > (B1,D1) p > .50

Superior effect for strong SOC: (B2,D2) > (B1,D2) p= .182

SOC effect (inverse) for no eval: (B1,D2) < (B1,D1) p= .479

SOC effect for superior eval: (B2,D2) > (B2,D1) p= .053

Table 8

Performance of Subjects in G1 and G2

Plotted by Social Identity
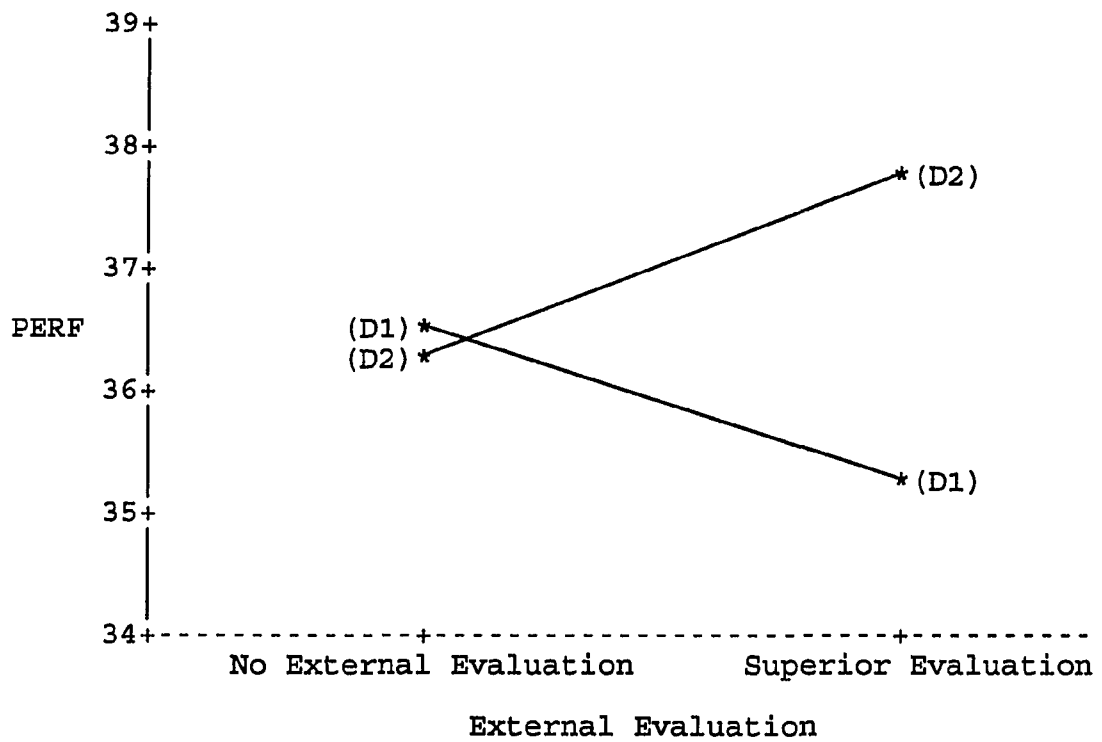
```
39+
   |
   |
38+                                              *(D2)
   |
   |
37+
   |
PERF         (D1) *
   |         (D2) *
36+
   |
   |                                             *(D1)
35+
   |
   |
   |
34+--------------+--------------------------+----------
      No External Evaluation        Superior Evaluation
```

External Evaluation

PERF   mean performance, final session, adjusted for
       covariates

D1   weak social identity (SOC < 24)

D2   strong social identity (SOC > 24)

Table 9

Ancova Using Subjects in G5 and G6

Dependent Variable: PERF   R-square   .8830

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	4529.7	647.1	51.8	.0001
Error	48	600.5	12.5		
Total	55	5130.2			

Source	DF	Sum of Squares	F value	Pr > F
ABIL	1	4066.5	325.06	.001
SUP	1	73.5	5.87	.019
SOC	1	96.6	7.73	.001
SOC*SUP	1	181.1	14.48	.001
PERS	1	87.0	6.95	.011
PERS*SUP	1	5.1	0.40	.528
SOC*PERS	1	100.5	8.03	.001

Table 10

Mean Performance of Subjects in G5 and G6

by Social Identity

EXTERNAL EVALUATION SOCIAL IDENTITY	No External Evaluation (B1)	Superior Evaluation (B2)
Weak (D1)	38.9	36.9
Strong (D2)	33.8	39.5

Mean performance for PERF as adjusted for covariates

Weak social identity defined as SOC < 24

Strong social identity defined as SOC > 24

PERF = ABIL + SUP + PERS + PERS*SUP + DS + DS*SUP + DS*PERS

n= 49

Comparison of Cell Means

Superior effect for weak SOC: (B2,D1) > (B1,D1)   p > .50

Superior effect for strong SOC: (B2,D2) > (B1,D2)   p= .003

SOC effect (inverse) for no eval: (B1,D2) < (B1,D1)   p= .006

SOC effect for superior eval: (B2,D2) > (B2,D1)   p= .054

Table 11

Performance of Subjects in G5 and G6

Plotted by Social Identity

```
        |
    40 +                                          * (D2)
        |
        |
        |
    39 +              (D1) *
        |                   
        |
    38 +
        |
        |
    37 +                                          * (D1)
PERF    |
        |
    36 +
        |
        |
    35 +
        |
        |
    34 +
        |              (D2) *
        |
    33 +--------------+--------------------------+----------
         No External Evaluation      Superior Evaluation
```

External Evaluation

PERF   mean performance, final session, adjusted for
        covariates

D1   weak social identity (SOC < 24)

D2   strong social identity (SOC > 24)

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Table 12

Ancova Using Subjects in G1 and G3

Dependent Variable: PERF   R-square .8893

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	4057.8	579.7	48.3	.0001
Error	42	505.2	12.0		
Total	49	4563.0			

Source	DF	Sum of Squares	F value	Pr > F
ABIL	1	3784.4	314.65	.001
PEER	1	28.3	2.36	.132
SOC	1	3.5	0.29	.591
SOC*PEER	1	0.1	0.01	.981
PERS	1	4.5	0.37	.544
PERS*PEER	1	47.3	3.93	.054
SOC*PERS	1	2.7	0.23	.638

Table 13

Ancova Using Subjects in G5 and G7

Dependent Variable: PERF   R-square   .9084

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	4711.0	673.0	58.0	.0001
Error	41	475.2	11.6		
Total	48	5186.2			

Source	DF	Sum of Squares	F value	Pr > F
ABIL	1	3843.1	331.61	.001
PEER	1	119.3	10.29	.003
SOC	1	120.1	10.37	.003
SOC*PEER	1	97.9	8.44	.006
PERS	1	141.6	12.22	.001
PERS*PEER	1	71.5	6.17	.017
SOC*PERS	1	129.4	11.16	.002

Table 14

Mean Performance of Subjects in G5 and G7

by Social Identity

EXTERNAL EVALUATION SOCIAL IDENTITY	No External Evaluation (C1)	Peer Evaluation (C2)
Weak (D1)	39.7	41.5
Strong (D2)	34.4	42.1

Mean performance for PERF as adjusted for covariates

Weak social identity defined as SOC < 24

Strong social identity defined as SOC > 24

PERF = ABIL + PEER + PERS + PERS*PEER + DS + DS*PEER + DS*PERS
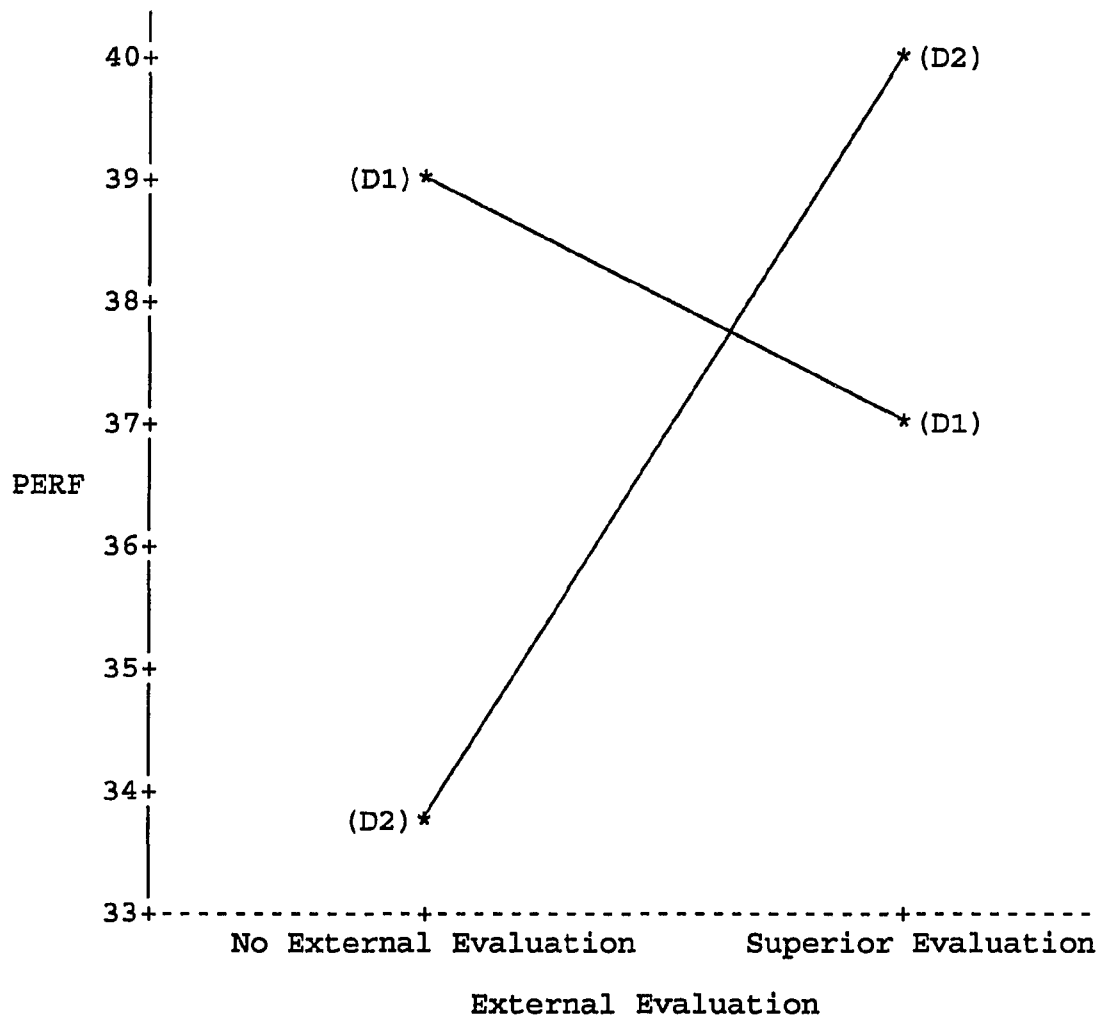
n= 44

Comparison of Cell Means

Peer effect for weak SOC: (C2,D1) > (C1,D1)   p= .169

Peer effect for strong SOC: (C2,D2) > (C1,D2)   p= .001

SOC effect (inverse) for no eval: (C1,D2) < (C1,D1)   p= .004

SOC effect for peer evaluation: (C2,D2) > (C2,D1)   p= .381

Table 15

Performance of Subjects in G5 and G7

Plotted by Social Identity


```
      |
   42+|                                              * (D2)
      |
      |                                          * (D1)
   41+|
      |
      |
   40+|
      |      (D1) *
      |
   39+|
PERF  |
   38+|
      |
      |
   37+|
      |
      |
   36+|
      |
      |
   35+|
      |           (D2) *
      |
   34+----------------+------------------------+----------
          No External Evaluation       Peer Evaluation

                    External Evaluation
```

PERF   mean performance, final session, adjusted for
          covariates
D1   weak social identity (SOC < 24)
D2   strong social identity (SOC > 24)

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Table 16

Mean Performance of Subjects in G1 and G3

by Personal Identity

EXTERNAL EVALUATION PERSONAL IDENTITY	No External Evaluation (C1)	Peer Evaluation (C2)
Weak (D1)	36.5	35.2
Strong (D2)	32.9	37.7

Mean performance for PERF as adjusted for covariates

Weak personal identity defined as PERS < 40

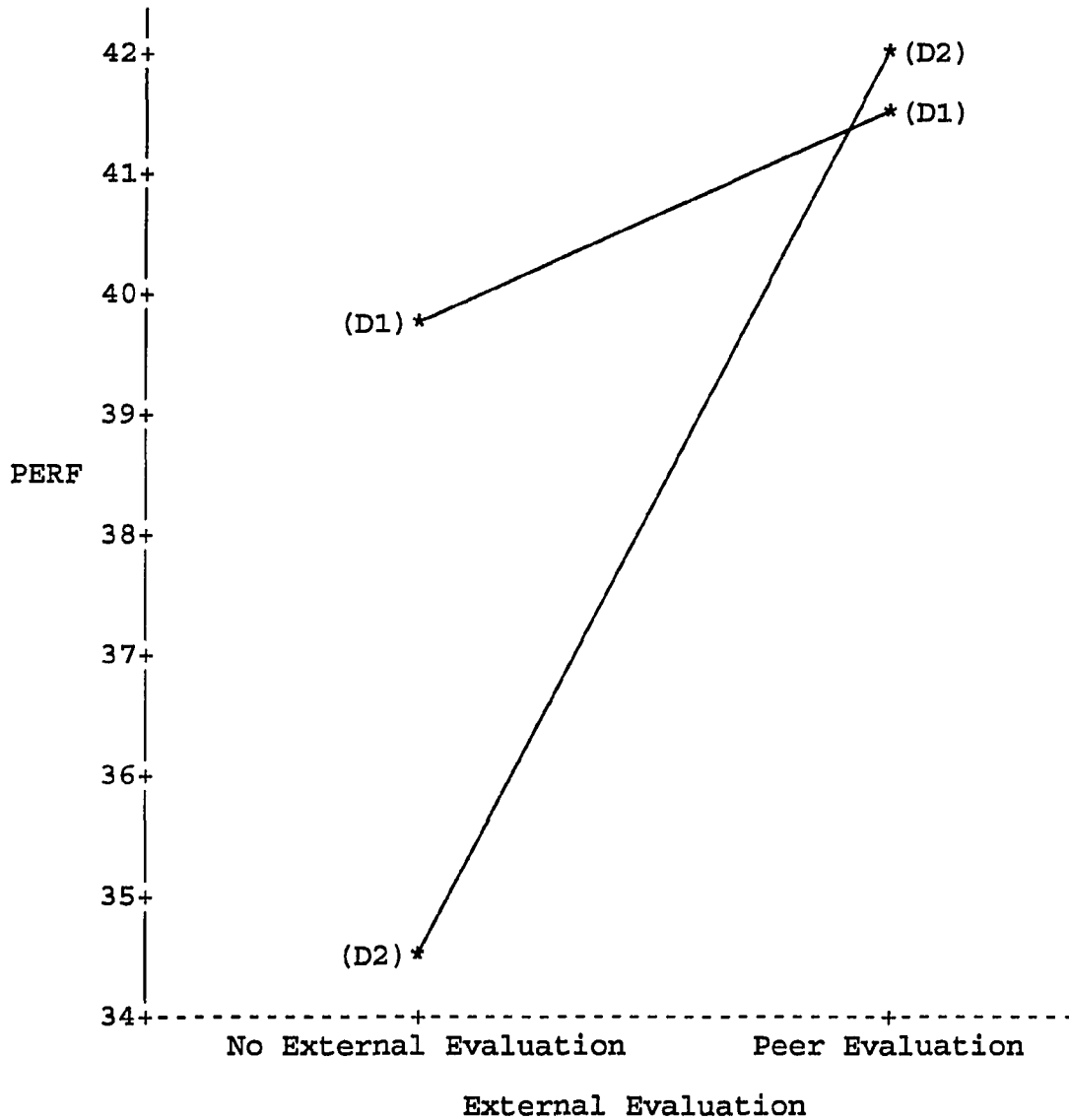Strong personal identity defined as PERS > 40

PERF = ABIL + PEER + SOC + SOC*PEER + DP + DP*PEER + DP*SOC

n= 48

Comparison of Cell Means

Peer effect for weak PERS: (C2,D1) > (C1,D1)   p > .50

Peer effect for strong PERS: (C2,D2) > (C1,D2)   p= .001

PERS effect (inverse) for no eval:(C1,D2) < (C1,D1)   p= .011

PERS effect for peer evaluation: (C2,D2) > (C2,D1)   p= .046

Table 17

Performance of Subjects in G1 and G3

Plotted by Personal Identity

```
        |
    38 +                                              * (D2)
        |
        |
        |
    37 +
        |
        |
  (D1) *
    36 +
        |
PERF    |
        |                                              * (D1)
    35 +
        |
        |
        |
    34 +
        |
        |
  (D2) *
    33 +
        |
        |
        |
    32 +- - - - - - - - - - - -+- - - - - - - - - - - - - - - - - - - - - - -+- - - - - - - - -
          No External Evaluation              Peer Evaluation

                         External Evaluation
```

PERF   mean performance, final session, adjusted for
        covariates

D1   weak personal identity (PERS < 40)

D2   strong personal identity (PERS > 40)

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Table 18

Mean Performance of Subjects in G5 and G7

by Personal Identity

EXTERNAL EVALUATION PERSONAL IDENTITY	No External Evaluation (C1)	Peer Evaluation (C2)
Weak (D1)	39.4	38.2
Strong (D2)	36.2	43.4

Mean performance for PERF as adjusted for covariates

Weak personal identity defined as PERS < 40

Strong personal identity defined as PERS > 40

PERF = ABIL + PEER + SOC + SOC*PEER + DP + DP*PEER + DP*SOC
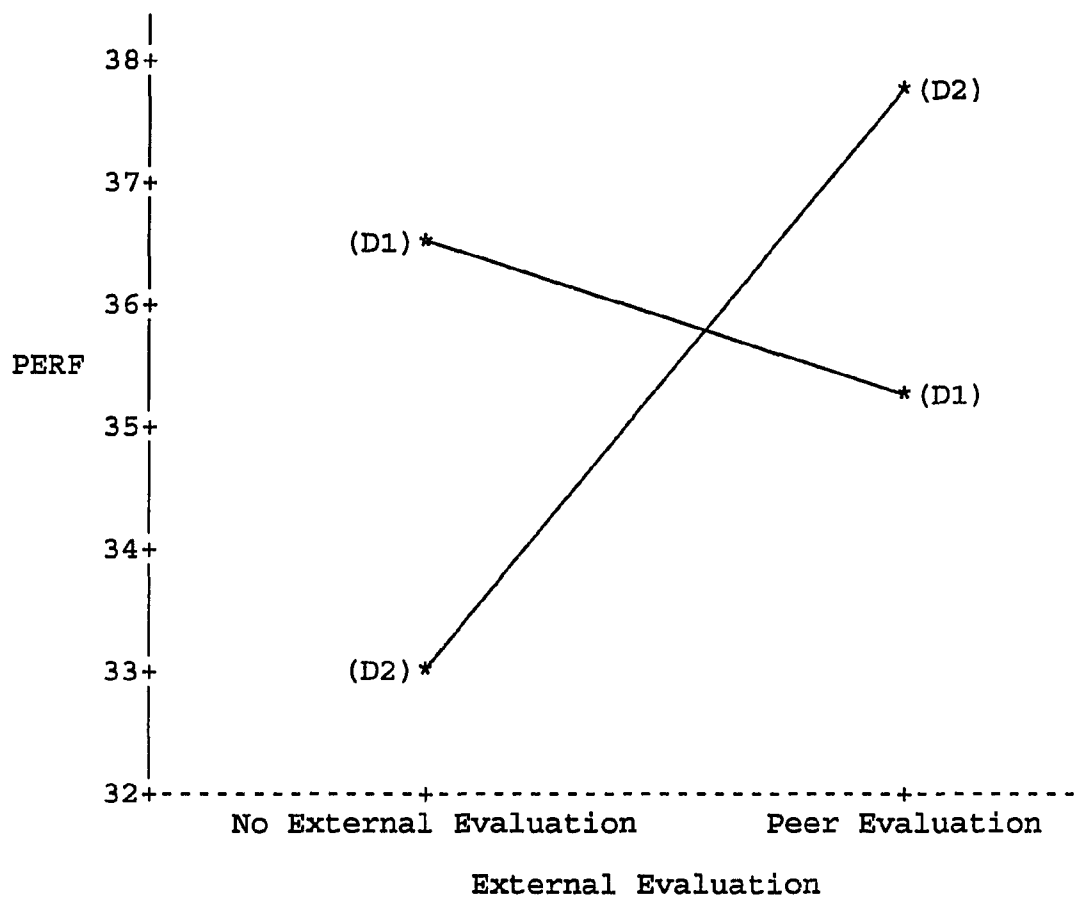
n= 47

Comparison of Cell Means

Peer effect for weak PERS: (C2,D1) > (C1,D1)   p > .50

Peer effect for strong PERS: (C2,D2) > (C1,D2)   p= .001

PERS effect (inverse) for no eval:(C1,D2) < (C1,D1)   p= .016

PERS effect for peer evaluation: (C2,D2) > (C2,D1)   p= .001

Table 19

Performance of Subjects in G5 and G7

Plotted by Personal Identity

```
           |
           |                                          *(D2)
    43+     |
           |
           |
    42+     |
           |
           |
    41+     |
           |
           |
    40+     |
           |                                   *(D1)
           |              (D1)*
    39+     |
           |
PERF       |
           |                                              *(D1)
    38+     |
           |
           |
    37+     |
           |
           |       (D2)*
    36+     |
           |
           +------------------+------------------------+----------
              No External Evaluation        Peer Evaluation

                        External Evaluation
```

PERF   mean performance, final session, adjusted for
          covariates
D1   weak personal identity (PERS < 40)
D2   strong personal identity (PERS > 40)

Table 20

Ancova Using Subjects in G2 and G3

Dependent Variable: PERF   R-square .8152

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	2928.6	418.4	26.5	.0001
Error	42	663.7	15.8		
Total	49	3592.3			

Source	DF	Sum of Squares	F value	Pr > F
ABIL	1	2652.2	167.83	.001
EVAL	1	13.3	0.84	.364
SOC	1	8.2	0.52	.476
SOC*EVAL	1	25.3	1.60	.213
PERS	1	4.7	0.29	.590
PERS*EVAL	1	54.1	3.42	.071
SOC*PERS	1	7.1	0.45	.507

Note: EVAL represents external evaluation. EVAL has two
levels: peer, superior.

Table 21

Mean Performance of Subjects in G2 and G3

by Personal Identity

EXTERNAL EVALUATION PERSONAL IDENTITY	Superior Evaluation (C1)	Peer Evaluation (C2)
Weak (D1)	37.0	35.1
Strong (D2)	34.5	37.8

Mean performance for PERF as adjusted for covariates

Weak personal identity defined as PERS < 40

Strong personal identity defined as PERS > 40

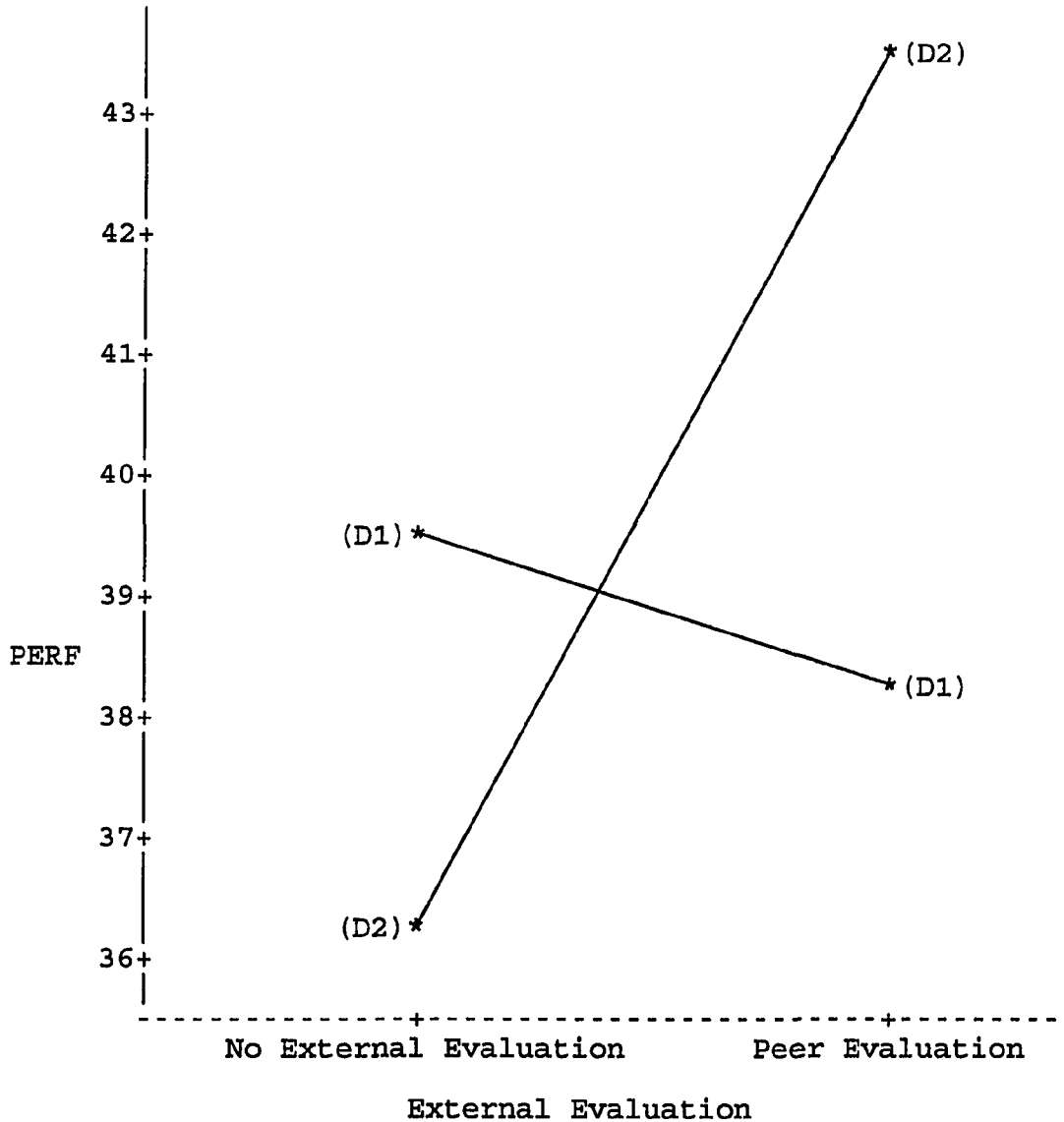PERF = ABIL + EVAL + SOC + SOC*EVAL + DP + DP*EVAL + DP*SOC

n= 47

Comparison of Cell Means

Superior effect for weak PERS: (C2,D1) < (C1,D1) p= .165

Peer effect for strong PERS: (C2,D2) > (C1,D2) p= .024

PERS effect (inverse) for sup ev: (C1,D2) < (C1,D1) p= .089

PERS effect for peer evaluation: (C2,D2) > (C2,D1) p= .063

Table 22

Ancova Using Subjects in G6 and G7

Dependent Variable: PERF   R-square .8670

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	3728.8	532.7	40.1	.0001
Error	43	571.9	13.3		
Total	50	4300.6			

Source	DF	Sum of Squares	F value	Pr > F
ABIL	1	3413.1	256.64	.001
EVAL	1	6.3	0.47	.496
SOC	1	21.5	1.62	.210
SOC*EVAL	1	1.9	0.14	.708
PERS	1	15.9	1.19	.230
PERS*EVAL	1	30.0	2.26	.140
SOC*PERS	1	15.0	1.13	.294

Note: EVAL represents external evaluation. EVAL has two
levels: peer, superior.

Table 23

Mean Performance of Subjects in G6 and G7

by Personal Identity

EXTERNAL EVALUATION PERSONAL IDENTITY	Superior Evaluation (C1)	Peer Evaluation (C2)
Weak (D1)	39.7	41.1
Strong (D2)	39.3	43.0

Mean performance for PERF as adjusted for covariates

Weak personal identity defined as PERS < 40

Strong personal identity defined as PERS > 40

PERF = ABIL + EVAL + SOC + SOC*EVAL + DP + DP*EVAL + DP*SOC

n= 49

Comparison of Cell Means

Peer effect for weak PERS: (C2,L1) > (C1,L1)   p= .184

Peer effect for strong PERS: (C2,L2) > (C1,L2)   p= .005

PERS effect (inverse) for sup ev: (C1,L2) < (C1,L1)   p= .399

PERS effect for peer evaluation: (C2,L2) > (C2,L1)   p= .116