The Impact of Superior-Subordinate Identity and Possible Ex Post Adjustment on Subordinate Expectancy and Performance

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ABSTRACT
Firms often evaluate subordinate performance relative to a difficult, but attainable goal set at the beginning of the evaluation period. For many, a mechanism exists by which this goal may be adjusted downward at the end of the period to account for an uncontrollable negative event. We examine experimentally how the knowledge that a downward ex post goal adjustment is possible affects subordinates’ expectancy of goal attainment and performance when a negative uncontrollable event occurs, and whether high identity, defined as high perceived social connectedness between the superior and subordinate, moderates this effect. We find that, in periods when a negative uncontrollable event occurs, high superior-subordinate identity can offset the otherwise negative impact of the potential for downward ex post goal adjustment on expectancy of goal attainment and individual performance. Thus, creating an organizational culture that promotes identity between superiors and subordinates may complement incentive-based controls in motivating subordinate performance.

Key words: ex post goal adjustment, expectancy, performance, identity.
INTRODUCTION

Extensive evidence on the effectiveness of performance goals at motivating individual effort and performance has led to the widespread use of budget-based incentive structures in organizations (e.g., budget-linear contracts) (Chenhall 2003). Goals linked to the budgeting process are typically set at the beginning of an evaluation period (ex ante) and subordinate performance relative to these same goals is evaluated at the end of the period (ex post) with bonuses paid for performance that meets or exceeds the goal (Merchant 1987). However, events outside of the subordinate’s control can increase the risk that subordinates will be unable to achieve their ex ante goals despite exerting effort at levels desired by their superiors. Consequently, firms often attempt to improve the efficiency of goal-based incentive contracts by allowing superiors discretion to adjust employees’ performance goals downward during their ex post performance evaluations (Gibbs, Merchant, Van der Stede and Vargus 2004; Hoppe and Moers 2011; Libby and Lindsay 2010).1

While prior research has focused extensively on whether and how superiors use their discretion in performance evaluation (e.g., Woods 2012; Bol, Keune, Matsumura and Shin 2010; for a review, see Bol 2008), the purpose of our study is to examine how the knowledge that superiors have discretion over ex post goal adjustment impacts subordinate’s expectancy of goal attainment and performance in periods of negative uncontrollable events.2 In addition, we examine whether subordinates’ expectancy or goal attainment and performance in such periods are moderated by the degree of identity between the subordinate and their superior where identity

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1 We focus on uncontrollable events with a negative rather than a positive impact on subordinates’ ability to achieve their target because prior research indicates adjustments for windfall gains are rare and subordinates are most concerned with the impact of downside rather than upside compensation risk (Gibbs et al. 2004; Libby and Lindsay 2010; Merchant 1987).

2 Expectancy of goal attainment is defined as the individual’s belief, based on past experience, that the goal is attainable with concerted effort (Klein, Wesson, Hollenbeck, and Alge 1999; Webb 2004).
is defined as perceived social connectedness between individuals (Akerlof and Kranton 2005). Superior-subordinate identity can vary across firms for various reasons including differences in organizational structure and opportunities for employees to develop relationships with one another. For example, Nihal Parthasarathi, CEO and cofounder of CourseHorse, believes engaging employees over lawn and board games at Washington Square Park or Central Park increases the degree to which they identify with their superiors (Fastcompany.com 2016) while Google and SAS Inc. argue that recruiting and retaining top talent starts with creating a quality relationship with their employees (Fastcompany.com 2013).

Some superiors believe that holding subordinates accountable for negative uncontrollable events signals the importance of accurate forecasting and that subordinates will not be protected from similar events in the future (Bol, Hecht and Smith 2015). Therefore, subordinates face the risk that superiors will choose not to adjust the goal ex post even though they have the discretion to do so. Social identity theory suggests when superior-subordinate identity is high, subordinates likely anticipate their superiors’ behavior in a more positive light relative to subordinates whose identity with their superior is low (Brickson and Brewer 2001; Hewstone 1990). Consequently, we predict that, in periods when a negative uncontrollable event occurs, the possibility that superiors will make an ex post goal adjustment will increase subordinate’s expectancy of goal attainment more when superior-subordinate identity is high than when it is low. In addition, we predict a positive relation between expectancy of goal attainment and performance (controlling for ability) in periods when negative uncontrollable events occur. While our hypotheses address the indirect effect of possible ex post goal adjustment on performance via expectancy of goal attainment in periods of negative uncontrollable events, we also examine whether there is a direct positive effect of possible ex post goal adjustment on performance in such periods after
controlling for expectancy of goal attainment. Given mixed theory and evidence on this issue in prior research, we control for expectancy of goal attainment and examine the direct relationship via a supplemental research question. Our hypotheses and research question are summarized in the conceptual model presented in Figure 1.

[Insert Figure 1 here]

To test our predictions, we employ a 2 (Adjustment: possible or not possible) x 2 (Identity: High/Low) experiment. Undergraduate student-participants from a large public university are randomly assigned to the role of subordinate or superior. Each superior-participant (hereafter “superior”) is assigned a work group comprised of three subordinate-participants (hereafter “subordinate). Each subordinate performs an effort sensitive task that involves electronically completing concession stand orders (Presslee 2018). Goals are tailored to each subordinate’s ability such that they are difficult, yet attainable in “normal” periods, but near impossible to achieve in periods where a negative uncontrollable event occurs (hereafter “tough” periods). Identity between the subordinates and the superior is manipulated to be high or low using a series of tasks shown to build identity in prior research (Tajfel and Turner 1986; Kreiner and Ashforth 2004). Subordinates then complete four production periods – two normal periods and two tough periods that contain negative uncontrollable events - of the concession task under a budget-linear incentive contract. Half of the subordinates are aware that ex post goal adjustment at the end of tough periods is possible while the others are aware that ex post goal adjustment at the end of tough periods is not possible.

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3 Our study was approved by the Research Ethics Board at the university where the data was collected.
4 For exposition, we refer to our identity conditions as low vs. high; however, without ex ante knowledge of baseline identity between participants, groups may be more accurately classified as lower vs. higher identity. Indeed, few studies have operationalized truly low identity in a laboratory setting.
We examine the impact of our manipulations on two dependent variables, a measure of subordinates’ mean expectancy of goal attainment in tough periods and subordinates’ mean performance in tough periods. Using path analysis, we find results consistent with our predictions. Specifically, we find that superior-subordinate identity moderates the relation between the possibility of an ex post goal adjustment and expectancy of goal attainment in tough periods such that when an ex post goal adjustment is possible, subordinates have a higher expectancy of goal attainment when identity with the superior is high than when it is low. In addition, because expectancy of goal attainment has a positive impact on performance in tough periods, the possibility of an ex post adjustment has no impact on performance through expectancy in such periods when superior-subordinate identity is low, but possibility of an ex post adjustment has a positive indirect effect on performance through expectancy when superior-subordinate identity is high. Finally, we explore the impact of the opportunity for ex post adjustment on performance in tough periods, controlling for expectancy of goal attainment. We find that the net effect (combined indirect and direct effect) of a possible ex post adjustment goal adjustment on performance is negative and significant when superior-subordinate identity is low, but has no effect when superior-subordinate identity is high. Thus, high identity appears to mitigate the impact of the possibility of ex post goal adjustment on subordinate performance in tough periods. Supplemental analysis of post-experimental questions indicates making available and appropriately using ex post adjustment and/or increasing superior-subordinate identity increases subordinates’ satisfaction with the relationship they have with their superior.

Our paper contributes to both research and practice. Despite prior research stressing the importance of the superior-subordinate relationship in determining the effectiveness of ex post goal adjustments (Bol 2008; Gibbs et al. 2004), few studies have empirically examined how ex
post goal adjustments might impact goal pursuit (one exception is Kelly, Webb, and Vance 2015) and no study, that we are aware of, has examined how superior-subordinate identity moderates the effect of a mechanism to adjust goals (ex post or otherwise) for negative uncontrollable events on expectancy of goal attainment and performance when negative uncontrollable events occur. In addition, Heinle, Hofmann, and Kunz (2012) observe there is little prior research on identity as a form of control even though it has been established that individuals express disutility from working to a standard that is less than the organizational norm (Stevens and Thevaranjan 2010) and from taking actions that “let their boss down” (Charness and Dufwenberg 2006). We find that a higher degree of identity between superiors and subordinates can complement incentive-based controls and has the potential to reduce monitoring costs.

From the perspective of practice, our results suggest that allowing superiors discretion over ex post goal adjustment is more effective in motivating subordinate effort and performance in settings where negative uncontrollable events may occur when identity between the superior and subordinate is high than when it is low. This result echoes the argument made by Gibbs et al. (2004) that increasing subordinates’ faith in their superior’s evaluation increases the benefits and decreases the costs associated with allowing discretionary adjustments. Prior research indicates employees’ identity with their organization is positively correlated with their degree of affective organizational commitment, job satisfaction, job involvement and organizational citizenship behavior (Jones and Volpe 2010); thus, firms may wish to implement organizational practices that build these positive organizational outcomes to increase superior-subordinate identity. These practices may also indirectly impact subordinates’ expectancy of goal attainment and performance when superiors have discretion over ex post goal adjustment.

In the next section, we review the related literature and develop our hypotheses. We then
describe our experimental design in section three and summarize our results in section four. Implications of our study for research and practice are included in the final section of our paper.

BACKGROUND AND HYPOTHESES

Background

Organizations regularly use goal-based incentives to motivate employee performance (e.g., Anderson, Dekker, and Sedatole 2010; Presslee, Vance, and Webb 2013). A well-established finding is that more difficult goals motivate greater effort toward goal attainment than less difficult goals, as long as individuals remain committed to goal attainment (Bonner and Sprinkle 2002). An important determinant of goal commitment is whether individuals believe their goal is attainable, otherwise known as their expectancy of goal attainment (Klein, Wesson, Hollenbeck, and Alge 1999; Webb 2004). Indeed, firms regularly assign employees’ difficult goals based on their ability, and better matching between assigned goals and employee ability improves employee expectancy of goal attainment (Locke and Latham 1990).

Negative uncontrollable events increase the risk that subordinates will be unable to achieve their assigned goals, which can decrease subordinates’ expectancy of goal attainment. Consequently, superiors are often allowed discretion to adjust subordinates’ performance goals downward at the end of an evaluation period when a negative uncontrollable event occurs that would make the assigned goal practically unattainable (Gibbs et al. 2004; Hoppe and Moers 2011; Libby and Lindsay 2010). When subordinates are aware their superior has discretion to

5 Goal difficulty is a “concept of relationship” between a person and a goal level (Latham and Locke 1991, p. 214). Therefore, the same goal level may be difficult for one person and easy for another depending on each person’s ability to perform in a task.

6 Alternatively, firms may attempt to filter out the effect of negative uncontrollable events on employee compensation by using relative performance evaluation (i.e., tournament-based incentives) (Lazear and Rosen 1981). However, Kelly et al. (2015) argue that relative performance evaluations lack the ex-ante motivational
make ex post adjustments to their goals to account for uncontrollable events, their expectancy of
goal attainment should be on average higher than when subordinates are aware superiors have no
such discretion. Yet, superiors who have discretion to adjust assigned goals ex post for negative
uncontrollable events do not always choose to do so, or if they do, they may insufficiently
account for the negative event (Libby and Lindsay 2010; Drury and Tayles 1995; Merchant
1987). Superiors may choose to hold the line on ex ante goals in the belief that holding
employees accountable for negative uncontrollable events signals the importance of accurate
forecasting and that subordinates will not be protected from similar events in the future (Bol et
al. 2015). Subordinates who become aware within a performance period that a negative
uncontrollable event has occurred must therefore evaluate the probability that their superior, who
has the discretion to adjust goals ex post, will actually do so.

**Hypotheses Development**

The assignment of performance goals and the potential for an ex post goal adjustment are
typically embedded within pre-existing social relationships between superiors and subordinates
in organizations (Van Knippenberg 2000). Social identity theory describes people as maintaining
self-concepts that are inherently linked to the social groups to which they belong (Tajfel 1978).
Specifically, individuals tend to frame their environment through a lens of in-group and out-
group membership and they try to positively differentiate their in-group from relevant out-
groups. To this end, individuals are motivated to make positive evaluations of in-group
members’ behavior and negative evaluations of out-group members’ behavior (Ashforth and

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properties that are associated with performance goals. Further, relative evaluation does not lend itself well to
heterogeneous (either in task, in the negative events employees face, or in employee ability) workplaces (Baiman
and Rajan 1995).
Increased identity has been shown to result in perceptions of a common-fate or belongingness (Ashforth, Harrison and Corley 2008), increased affinity or affection (Ellemers, Spear and Doosje 1997; Tajfel 1978), increased trust (Puusa and Toivanen 2006; Borgen 2001), and general in-group favoritism or bias (Ellemers et al. 1997; Mullen, Brown, and Smith 1992). Thus, subordinates who identify highly with their superior are likely to believe, when the opportunity is available, that superiors will take actions that are consistent with in-group members’ best interests (Tanis and Postmes 2005).

For these reasons, we expect that, in periods where a negative uncontrollable event occurs, the possibility that the superior will make an ex post goal adjustment will lead subordinates to maintain higher expectancy of goal attainment when their identity with their superior is high versus low. Subordinates that identify with their superior are likely to anticipate their superiors’ end-of-period behavior in a more positive frame and to trust them to maintain positive in-group norms (Gibbs et al. 2004; Brickson and Brewer 2001; Hewstone 1990). Indeed, prior research finds higher identity between individuals increases the perceived probability or expectation that each party will act to benefit the other party where possible (Hirst, Van Dick and Van Knippenberg 2009). Thus, we propose the following interaction hypothesis:

H1: When a negative uncontrollable event occurs, the knowledge that ex post goal adjustment is possible increases subordinate’s expectancy of goal attainment more when superior-subordinate identity is high than when it is low.

A well-established finding in prior research is that higher levels of expectancy result in greater effort towards goal attainment, and ultimately higher performance (Klein et al. 1999; Klein, Cooper, and Monahan 2013). Since expectancy of goal attainment is predicted to be

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7 We note that all of our predicted effects are conditioned on the presence of a negative uncontrollable event since in periods where events unfold as expected, ex post goal adjustment is unnecessary and thus, expectancy of goal attainment is unaffected by its possibility.
higher when a negative uncontrollable event occurs, subordinates know that ex post adjustment is possible and identity is high (H1) and higher expectancy results in higher performance, we formulate the following two hypotheses:

H2a: *When a negative uncontrollable event occurs, expectancy of goal attainment is positively associated with performance.*

H2b: *When a negative uncontrollable event occurs, the interactive effect of the possibility of an ex post goal adjustment and superior-subordinate identity on subordinate performance will be mediated by expectancy of goal attainment.*

Finally, we explore whether there is a direct relationship between the possibility of an ex post goal adjustment and subordinate performance after controlling for the effects of expectancy of goal attainment. On one hand, allowing superiors discretion to adjust goals downward ex post in response to an uncontrollable event reduces subordinates’ compensation risk (Bol et al. 2010). Further, the potential for an ex post adjustment introduces some probability that subordinates’ goals will be made less difficult, which distorts an otherwise objective performance measure (Baker, Gibbons and Murphy 1993). For these reasons, the possibility of an ex post goal adjustment (controlling for its effect via expectancy of goal attainment) could have a negative effect on subordinate effort and performance. On the other hand, the possibility of an ex post goal adjustment could reduce the subordinates’ perceived marginal cost of effort if they believe the performance standard will be reduced and thus, subordinates might actually work harder. For this reason, when a negative uncontrollable event occurs, the possibility of an ex post goal adjustment (controlling for its effect via expectancy of goal attainment) could have a positive effect on subordinate effort and performance.

Results of three prior related empirical studies on this issue are also equivocal, although their settings differ from ours. First, Arnold and Artz (2015), using archival and survey data, find
the degree to which targets or goals are revised within a period is negatively associated with firm performance (measured as return on assets). The authors speculate that firm-level effects are due to reduced employee effort in firms that adjust targets more often as compared to those that adjust targets less often. Second, in a field setting, Gibbs et al. (2004) find allowing superiors discretion to make ex post adjustments is associated with higher subordinate performance when trust between superior and subordinate is high instead of low (where trust is measured as longer tenure with the firm). Third, Kelly et al. (2015) conduct an experiment and find when subordinates know an ex post goal adjustment may occur, their performance is higher when the ex ante goal is perceived as moderately difficult, but not when the ex ante goal is perceived as very difficult to achieve.⁸ Based on both equivocal theory and empirical results, we pose the following research question:

RQ1: When a negative uncontrollable event occurs, what effect will the possibility of an ex post goal adjustment have on subordinate performance controlling for expectancy of goal attainment?

METHOD

Overview

We employ a two (Adjustment: possible or not possible) x two (Identity: Low or High) experimental design in which Adjustment is manipulated between subjects and Identity is manipulated between sessions (see ‘Independent Variables’ subsection). A total of 104 undergraduate students from a large public university participate in experimental sessions

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⁸ Kelly et al. (2015) find the relation between ex post adjustment availability and performance is mediated by procedural fairness perceptions. In that study, goal difficulty is set based on the proportion of pilot study participants that exceed a certain level of performance while in our study we assign goals based individual ability. Thus, we remove variance in performance that is due to the relationship between goal difficulty and ability, which likely limits the variation in procedural fairness perceptions about the assigned goal in our study.
consisting of either eight or 12 participants. We randomly assign participants to the role of superior or subordinate at a ratio of 1:3. Our analysis considers the performance of the 78 participants assigned the role of subordinate; however, in-person participants assuming the role of superiors are necessary to ensure the salience of the identity manipulation in the lab.

Subordinates complete two practice periods and four production periods of an effort intensive task where subordinates fill concession orders (Presslee 2016). The practice periods are designated as normal periods where the ratio of small to large concession orders is 4:1. Two production periods were normal whereas two production periods were tough due to negative uncontrollable events. We simulate a negative uncontrollable event by introducing unexpected tough periods where the ratio of small to large concession orders is 1:4. Subordinates are aware that tough periods can occur, but do not know in advance which periods will be tough or normal. We use results from the tough periods to test our hypotheses because, as discussed earlier, it is in the tough periods that theory suggests the possibility of an adjustment and superior-subordinate identity will interact to affect subordinates’ expectancy of goal attainment and performance.

Individualized goals for the production periods are set at 100 percent of each subordinate’s performance in the second practice period. Given subordinates’ performance goals are set during a “normal” period, it is extremely difficult for them to achieve these goals during a tough period without ex post goal adjustment. Subordinates earn $0.05 for each order they correctly fill during the practice periods. During the production periods, they receive a $5 flat wage plus a bonus of $1 in each period where they attain their assigned goal plus $0.05 per concession order completed in excess of this goal. Our dependent variables are subordinates’ expectancy of goal attainment and performance relative to their individually assigned goal in tough periods (see ‘Dependent Variable’ subsection for measurement details).
Experimental Task

We use a modified version of Presslee’s (2016) computerized concession task where subordinates act as clerks at a concession stand. See Appendix A for a sample screen shot of the concession stand and clerk. Each period, subordinates receive either a two-item order or a four-item order. Each order consists of items that range over four product types and three sizes per product (12 product/size combinations). The four product types include popcorn, drink, candy, and ice cream, and the three sizes are small (S), medium (M), and large (L). For example, a customer order could read “large popcorn and small ice cream” or “large popcorn, small ice cream, medium drink, small candy.”

To obtain the items to fill the order, participants move their clerk icon in front of the requested product using the left or right arrow key on their keypad. Once the icon is moved in front of the item, participants type the letter that corresponds with the size of the product being ordered (S, M, or L). Products are selected one at a time, and once selected, the clerk icon returns automatically to the starting position on the screen. Once an order is filled, the program checks whether the order is filled correctly. If so, participants receive a new order. If the order is filled incorrectly, the participants receive a message indicating they should try again. To discourage subordinates from randomly typing to complete orders, they are allowed up to five tries to get the order correct before their total score is reset to zero and they are made aware of this fact. After each incorrect response, the program warns subordinates about the number of attempts remaining before their score will be reset. This process of receiving and completing orders continues until the end of each three-minute period. The computer screen then shows the subordinates their total number of correct orders completed at the end of each period and their earnings for that period.
Independent Variables

Possibility of Ex Post Goal Adjustment

Ex ante goals in the four production periods for each subordinate are set equal to 100 percent of that subordinate’s performance during the second (normal) practice period. In all conditions, subordinates learn that negative events might occur that would make their goal difficult to achieve. Subordinates in the Adjustment Possible condition are told “Due to the harmful effects these more difficult periods have on your opportunity to earn a performance bonus, your [team] supervisor, [(insert team superior name), from your team (insert team name)] has the opportunity to adjust your assigned goal downwards. If your [team] supervisor does adjust your assigned goal, he or she will make this adjustment only at the end of the period.” Subordinates in the Adjustment Not Possible condition are told “However, your [team] supervisor, [(insert team superior name), from your team (insert team name)] does not have the option to adjust your assigned goal.” 9 For those subordinates who receive an ex post adjustment, we set the adjustment at 30 percent of the ex ante goal. Subordinates are unaware of the size of adjustment until after it is applied ex post. This adjustment, based on pilot testing, is set to sufficiently remove, on average, the impact of the negative event on subordinates' potential for goal attainment.10

It is important to note that in the Adjustment Possible condition, we required superiors to make the ex post goal adjustment in both periods two and four when the negative event occurred (i.e., in the tough periods) for purposes of experimental control. The alternative would have been to allow the superiors to choose whether to make the adjustment or not in which case some

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9 The words in square brackets appear only in the high identity condition where we invoke the team concept to build identity. The manipulation of superior-subordinate identity is described in the next section of the paper.
10 We report tests of the sufficiency of our ex post adjustment in returning goal difficulty to approximately ex ante levels in the Results section.
subordinates in the same experimental conditions would have received an adjustment in some periods while others did not. These changing dynamics within condition and across periods would make it difficult for us to isolate signal from noise.\textsuperscript{11} In addition, having the superior make the adjustment in both periods helps to isolate the effect of the potential for goal adjustment on subordinate performance while controlling for any strategic behavior unrelated to the goals of the experiment on the part of the superiors or the subordinates. Finally, this design choice allowed us to better examine how subordinates respond \textit{ex ante} to the possibility that an adjustment will be made \textit{ex post}. Whether the \textit{ex post} adjustment is made in a tough period is less important to test our hypotheses than setting up the possibility in the subordinate’s mind that such an adjustment might occur while he/she is exerting effort during a tough period.\textsuperscript{12}

\textit{Superior-Subordinate Identity}

\textit{Identity} is manipulated through completion of a series of group tasks. This approach is similar to prior social psychology studies (Kreiner and Ashforth 2004; Tajfel and Turner 1986), and is used to develop high identity or maintain low identity between superiors and subordinates via more personal wording.\textsuperscript{13} Each group of three subordinates and one superior takes part in three group tasks. First, each group creates a unique group name. Second, each group works to identify three similarities between group members. Third, each group completes a group task

\textsuperscript{11} Our design is not conceptually different from one in which a mechanistic superior is used to test the impact of a management control choice on subordinate employees (e.g., Cardinaels, Roodhooft, and Warlop 2004; Christ and Vance 2015; Jollineau, Vance, and Webb 2012). In this case, we needed to involve a participant as the superior to operationalize our identity manipulation effectively.

\textsuperscript{12} We also note that in both tough periods, subordinate participants in the \textit{Adjustment Possible} condition left the experiment better off financially than they would have been had the superior randomly or arbitrarily decided not to make the goal adjustment. In addition, the participants left the lab with any positive peripheral beliefs about the benevolence of their classmates that they may have brought with them to the lab in tact (Libby and Salterio 2017) since in all cases, the superior participants acted to the benefit of their assigned subordinates.

\textsuperscript{13} It is well-established in the literature that situated identification, as developed in the lab, is a necessary antecedent to deep structure identification developed naturally in organizations, and thus, laboratory experiments that manipulate identity among participants (e.g., minimal group studies) are effective tests of identity theory (e.g., Ashforth et al. 2008 Jackson 2002; Kelly and Presslee 2017; Rousseau 1998).
requiring them to solve two riddles (see Appendix B).

Our Identity manipulation requires that each experimental session be randomly assigned as either a high identity or low identity session. In the High Identity condition, the superior sits at the table with the three subordinates and participates in all three group-tasks described above. This ensures that the superior is viewed as a member of the group. To reinforce the high identity manipulation, the group’s unique name and the superior’s first name are repeatedly mentioned throughout the experimental session.

In the Low Identity condition, superiors provide their subordinates with verbal instructions for each group task that they read from a prewritten script. The superior then returns to their seat in a different part of the room while the three subordinates in the group complete the three group tasks. For these groups, there is no mention of the group name throughout the rest of the experimental session and the group never learns their superior’s name. Regardless of condition, all groups are given ten minutes to complete the three group tasks, and at the end of ten minutes the superior collects all of the groups’ responses and turns them in before returning to their computer.

**Dependent Variables**

We are interested in subordinates’ reactions to our Identity and Adjustment manipulations in periods where negative uncontrollable events occur. Therefore, our two dependent variables are calculated as means across the two tough periods. First, *Expectancy of goal attainment* is measured for all subordinates prior to each period by asking them to rate their level of agreement with a statement on a 7-point scale with endpoints “Strongly Disagree” (+1) and “Strongly Agree” (+7): “Assuming a more difficult period than normal (i.e., same ratio of 2 item to 4 item orders as your practice periods), I will earn a bonus in this period.” Subordinates are reminded
that their responses are not shared with members of their group or their superior. *Mean Expectancy* is the average response to this question across the two tough periods. Second, *Performance in tough periods*, is calculated as the number of correct orders completed by a subordinate in a period. *Mean Performance in tough periods* (hereafter *Mean Performance*) is subordinates’ average performance across the two tough periods. It is important to note that we control for subordinates’ *Ability*, measured as their performance in the second practice period, when testing hypotheses based on *Mean Performance* since those higher in ability tend to perform better than those lower in ability (Bonner and Sprinkle 2002).\(^{14}\) However, we do not control for *Ability* when testing hypotheses based on *Mean Expectancy* since all else equal, subordinates should have similar expectancies of goal attainment because they are assigned performance goals equal to their ability.\(^ {15}\)

**Experimental Procedures**

We outline our experimental procedures in Figure 2. In each session, eight to 12 participants enter the room, and one out of every four is randomly assigned the role of superior. The other participants are assigned the role of subordinate. Superiors are seated at computer stations on the farthest side of the room away from the subordinates. To begin the experimental session, all participants are assigned a user name and password to log on to the computer located at their seat. All participants then complete two, three-minute practice periods of the concession task.\(^ {16}\) Practice periods serve to familiarize participants with the concession task and allow us to

\(^{14}\) We note that subordinates’ goals are also set based on the number of orders completed in the second practice period (that is, goal = *Ability*).

\(^{15}\) Indeed, we find that *Ability* does not affect *Mean Expectancy* (not tabulated: $\beta = -0.03$, $p = 0.35$).

\(^{16}\) Through extensive pilot testing, we determined that six practice minutes with the concession task was sufficient to become proficient at this task (i.e., to limit learning effects).
determine each individual’s ability at the task. 17 During the practice periods, the ratio of two-item to four-item orders is always 4:1 (i.e., normal period) and participants earn $0.05 for each order they correctly fill. After the two practice periods are completed, participants move to another area of the room where they experience the Identity manipulation.

[Insert Figure 2]

Next, subordinates and superiors return to their previously assigned computer stations. Subordinates complete a set of manipulation check questions designed to measure their degree of identity with their superior. Then, subordinates are informed that they will complete four periods of the concession task, each lasting three minutes. Also, they are informed that in addition to a $5 flat wage for completing the experiment, they have the opportunity to earn a bonus each period of $1 for attaining an assigned goal, and $0.05 per concession order completed in excess of this goal. Individualized goals are set at 100 percent of the subordinate’s performance in his/her second practice period. 18 Subordinates then complete a quiz to confirm their understanding of the incentives and goal setting process and must successfully complete the quiz before moving on to the next part of the experiment.

Next, the possibility of a negative event that could make goals more difficult to achieve is introduced. All subordinates are told “… unlike your practice periods, there is a risk that you will encounter more 4-item concession orders than 2-item concession orders. As a result, attaining your assigned performance goal will be much harder in these periods.” Subordinates then experience the Adjustment manipulation. All subordinates take another quiz to ensure their

17 Average orders completed in the first practice period are 31.4 orders and in the second practice period are 34.7 orders. This difference is significant (t = 9.41, p < 0.01), which indicates some learning occurred over the two practice periods.

18 Performance goals are set under two assumptions: 1) future periods consist of a 4:1 ratio of two item to four item orders (i.e., normal periods), and 2) participants second practice period performance is indicative of ability.
understanding of the potential negative event and of the ex post adjustment mechanism (where applicable) before proceeding to the first production period. We operationalize the negative uncontrollable event by altering the ratio of two-item to four-item orders in a period. The ratio of two to four item orders is 4:1 in normal periods and 1:4 in tough periods.\textsuperscript{19} Production periods one and three are normal periods while production periods two and four are tough periods, although subordinates are not aware ahead of time when the ratio will change. Subordinates than proceed to the production periods. On completion of each of the four production periods, subordinates are informed of their performance relative to their assigned goal, whether an adjustment of the goal was made (only for those in the \textit{Adjustment Possible} condition), and the amount of any bonus earned.

On the other side of the room, we keep the superiors occupied while the subordinates are working by asking them to also complete four periods of the concession task under the piece-rate incentive contract ($0.05 per order correctly filled). In the \textit{Adjustment Possible} condition, superiors click on a button that appears on their computer screen at the end of each tough period to confirm that an adjustment will be made, or in the normal periods, they click on a button that moves their subordinates to the next period. Superiors in the \textit{Adjustment Not Possible} condition click on a button that appears on their computer screen at the end of each period to move subordinates to the next period. Superiors could not proceed to their own next period of production until all of their subordinates had completed the previous period.

At the end of each production period, superiors receive feedback about their own performance as well as the performance of the three subordinates assigned to them. After all

\textsuperscript{19} We conducted a pilot test where 30 participants complete a series of three-minute periods of the concession task while earning $0.05 per correct order. We find that on-average participants completed 30\% more orders in a normal period compared to a tough period.
periods are completed, all participants provide demographic information and respond to a series of post-experiment questions and are paid in cash as they exit the room.

RESULTS

Subordinates

Twenty-four (31 percent) of the 78 subordinates that participated in the experiment are male. The average subordinate is 20.1 years old, has spent 2.5 years in university, and has four months of full-time work experience. These demographic variables are uncorrelated with our dependent variables Mean Expectancy (all |r| < 0.08, p > 0.47) and Mean Performance (all |r| < 0.09, p > 0.41) with two exceptions: Mean Expectancy is correlated with years in university (r = -0.28, p = 0.01) and Mean Performance is correlated with age (r = -0.21, p = 0.06). All inferences made in the results section are unaffected by the inclusion of years in university and/or age as covariates in statistical tests, so years in university and age are not included in any further analyses.

Goal Assignment, Task Comprehension, and Manipulation Checks

The distribution of subordinates by experimental condition is presented in panel A of Table 1. Subordinates are assigned individual goals equal to their Ability, which is determined by their second practice period performance. Presented in panel B of Table 1, the mean (standard deviation) assigned goal is 34.7 (4.6) orders for all subordinates. As expected due to random assignment, assigned goal difficulty does not differ by Adjustment condition (p = 0.36) or by Identity condition (p = 0.16).

[Insert Table 1 here]

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20 All p-values in the paper are reported two-tailed.
Periods two and four contain a negative event. To test whether the negative event had sufficient negative impact on subordinates’ performance by making the ex ante goal extremely tough to achieve, we compare unadjusted goal attainment in these two tough periods to unadjusted goal attainment in normal periods that do not contain the negative event. As presented in Table 1 (panel C), in tough periods (i.e., periods two and four) that contain the negative event, the attainment rate of unadjusted goals is zero (n = 0) and one percent (n = 1), respectively. Conversely, in normal periods (i.e., periods one and three) that do not contain the negative event, the attainment rate of goals is 77 percent (n = 60) and 87 percent (n = 68), respectively. Thus, our negative event created a situation where a difficult goal becomes nearly unattainable for the average subordinate.

To examine whether the ex post goal adjustment of 30 percent for the negative event in the Adjustment Possible condition was sufficient to restore goal difficulty to approximately its ex ante level, we compare attainment rates for the Adjustment Possible condition in the tough periods before and after the adjustment. As presented in Table 1 (panel C), prior to adjustment, the attainment rate was zero in both periods two and four. Conversely, after the adjustment, the attainment rate was 72 percent (n = 28) and 82 percent (n = 32) in periods two and four, respectively. Further, t-tests confirm that attainment rates in the Adjustment Possible condition were significantly higher in normal periods than in tough periods prior to the adjustment (p < 0.01 for all), but were not significantly different in normal periods than in tough periods after the adjustment was made (p > 0.45 for all). Thus, our adjustment sufficiently removed the negative effect of the negative event on subordinates’ ability to attain the goal in tough periods, and restored goal difficulty to its normal level.

We evaluate the effectiveness of our Identity manipulation immediately after it is
introduced in the lab by asking subordinates to complete questions adapted from the Mael and Ashforth’s (1992) identity scale. Specifically, subordinates indicate their level of agreement on a 7-point scale (-3 (strongly disagree) to +3 (strongly agree)) to three statements: "My superior and I are a team" (Team), "On the whole, I like my superior" (Like), and "My superior and I will stand up for each other if need be" (Support). Confirmatory factor analysis indicates that these three measures represent a single construct with all factor loadings greater than 0.88 and an eigenvalue (variance explained) of 2.40 (80 percent). Cronbach’s alpha for this scale was very good at 0.85. Thus, we averaged subordinates’ responses to these three statements to create the variable Identity. Table 1 (panel D) indicates the mean (standard deviation) Identity for subordinates in the High Identity condition is 1.82 (0.89) compared to -0.09 (1.11) in the Low Identity condition. The difference between the High and Low Identity conditions is significant (t = 8.45, p < 0.01). Thus, our Identity manipulation was effective.21

**Descriptive Statistics**

Descriptive statistics are presented in Table 2. Results presented in Panel A indicate Mean Expectancy is higher when Identity is high (mean =3.21, std. dev. = 1.49) than when it is low (mean =2.85, std. dev. = 1.40) and when Adjustment is possible (mean =3.18, std. dev. = 1.51) than when it is not (mean = 2.90, std. dev. = 1.38). Mean Expectancy is highest when both Identity is high, and Adjustment is possible (mean = 3.67, std. dev. = 1.55) consistent with H1. In addition, we find a positive and significant correlation between Mean Expectancy and ability-

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21 The same three identity questions were asked during the post experiment questionnaire. Again, confirmatory factor analysis indicates that these three measures represent a single construct in our setting with all factor loadings greater than 0.87 and an eigenvalue (variance explained) of 2.39 (80 percent). Cronbach’s alpha for this scale was again very good at 0.93. Table 1 (Panel C) indicates the mean (standard deviation) rating of the average three questions for subordinates in the High Identity condition is 1.53 (1.15) compared to -0.19 (1.34) in the Low Identity condition. The difference between the High and Low Identity conditions is significant (t = 6.10, p < 0.01). There was no significant difference between the pre-and post-performance Identity measure for the Low Identity condition (t = 0.51, p = 0.61), but there is a marginally significant decrease between the pre- and post- measure of Identity for the High Identity condition (t = 1.88, p = 0.07).
adjusted Mean Performance ($r = 0.27$, $p = 0.02$), which is consistent with H2. We also find that, when superior-subordinate identity is low, ability-adjusted Mean Performance is higher when ex post adjustment is not possible (mean = 27.39, std. dev. = 1.48) then when ex post adjustment is possible (mean = 25.65, std. dev = 0.61). Conversely, we find that, when superior-subordinate identity is high, ability-adjusted Mean Performance is higher when ex post adjustment is possible (mean = 26.67, std. dev. = 0.62) then when ex post adjustment is not possible (mean = 26.21, std. dev = 0.62). Next, we use path analysis to further explore these findings and to test our hypotheses.

Hypotheses Tests

Path analysis allows for simultaneous analysis of manipulated variables and their relationships with multiple measured variables, all while reducing measurement error (Kline 2011). We test our path model using Stata 15 with maximum likelihood estimation and using robust clustered standard errors by work group to address the potential for correlated error terms among subordinates that have the same supervisor. We constrain the path estimate from Mean Expectancy to Mean Performance and from Adjustment to Mean Performance to be equal across Identity conditions, whereas we use unconstrained path estimates from Adjustment to Mean Expectancy such that a different coefficient is calculated for the Low Identity condition and the High Identity condition. Our path model fits the data well, and standardized path analysis results are presented in Figure 3 and Table 3.22

22 We cannot produce RMSEA, CFI, or chi-square statistics because we robust cluster standard errors by work group. However, a similar path model that does not robust cluster standard errors produces almost identical path coefficient results while suggesting our path model fits the data well ($\chi^2 (9) = 11.81$, $p = 0.22$; RMSEA = 0.09; CFI = 0.97).
H1 predicts that superior-subordinate identity moderates the effect of ex post adjustment possibility on subordinate expectancy. For those in the Low Identity condition, Adjustment does not affect Mean Expectancy (Table 3, Panel A: $\beta = -0.10, z = -0.73, p = 0.46$), whereas for those in the High Identity condition, Adjustment increases Mean Expectancy (Table 3, Panel A: $\beta = 0.27, z = 2.19, p = 0.03$). We conduct a post-estimation non-linear combination test to examine whether these two paths differ significantly from one another. As presented in panel B of Table 3, the High Identity path coefficient is significantly greater than the Low Identity path coefficient (Table 3, Panel B: $\beta = -1.06, z = -2.39, p = 0.02$). Thus, we find support for H1.

H2a and H2b predict that, when an uncontrollable event occurs, superior-subordinate identity moderates the effect of ex post adjustment possibility on subordinate performance via the positive effect that expectancy has on performance. As presented in Table 3 panel A, controlling for the positive effect of Ability ($\beta = 0.80, p < 0.01$), Mean Expectancy has a positive effect on Mean Performance ($\beta = 0.16, p < 0.01$). We compute the indirect (mediated) effect of Adjustment on Mean Performance via Mean Expectancy for both the Low and High Identity conditions. When constrained to the Low Identity condition, Adjustment has no indirect effect on Mean Performance (not tabulated: $\beta = -0.15, p = 0.70$). Conversely, when constrained to the High Identity condition, Adjustment has a positive indirect effect on Mean Performance (not tabulated: $\beta = 0.39, p = 0.06$). We conduct a post-estimation non-linear combination test and find that the High Identity indirect path coefficient is significantly greater than the Low Identity.

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23 We also conduct an ANOVA with the dependent variable Mean Expectancy and the independent variables Identity, Adjustment, and Identity x Adjustment. The interaction is significant (not tabulated: $F = 5.02, p = 0.02$). Post-ANOVA planned comparisons confirm that Adjustment negatively affects Mean Expectancy in the Low Identity condition (not tabulated: $t = -1.47, p = 0.15$) and positively affects Mean Expectancy in the High Identity condition (not tabulated: $t = 3.30, p < 0.01$).
path coefficient (not tabulated: $\beta = 0.54$, $p = 0.02$). These results provide support for H2a and H2b.

Finally, we raise a research question regarding the effect of the possibility of an ex post adjustment on performance controlling for the effect of expectancy when a negative uncontrollable event occurs. As presented in panel A of Table 3, Adjustment has a marginally negative direct effect on Mean Performance after controlling for the effect of Mean Expectancy ($\beta = -0.09$, $z = -1.46$, $p = 0.15$). Thus, it appears the possibility of an ex post adjustment has two countervailing effects on performance in tough periods. First, Adjustment indirectly increases performance through Expectancy, but only when Identity is high. Second, controlling for the positive effects of Expectancy, Adjustment decreases performance in tough periods. The net effect (combined indirect and direct effect) of Adjustment on Mean Performance is negative and significant in the Low Identity condition (not tabulated: $\beta = -0.97$, $p = 0.03$), but insignificant in the High Identity condition (not tabulated: $\beta = -0.42$, $p = 0.48$). Thus, it appears that high identity helps to mitigate the otherwise negative effect a possible ex post adjustment has on subordinate performance in tough periods.

**Supplemental Analysis**

**Satisfaction**

Anderson, Dekker, and Sedatole (2010) acknowledge that research on the effect of goal-based incentive programs tend to focus on short-term performance implications, but neglect to consider their impact on long-term outcomes such as employee satisfaction, which has been shown to contribute to long-term firm performance (Harter, Schmidt, and Hayes 2002; Koys 2001). We use post-experiment questions to provide some evidence of the effect that superior-
subordinate identity and the possibility of ex post goal adjustment has on subordinates’ satisfaction with their superior.

Kelly et al. (2015) suggest subordinates likely view their superiors in a more positive light (via procedural fairness) when their superiors can adjust performance goals ex post and they choose to use that discretion. In developing our hypothesis, we also argue that when a subordinate identifies more with their superior, they likely perceive their superior and their superior's actions in a more positive light. To test whether these positive perceptions impact subordinates’ satisfaction, we analyze their responses to three post-experiment questions: "Overall, I feel betrayed by my superior" (Betrayed, reverse coded), "Overall, I trust my superior" (Trust), and "Overall, I feel a great deal of anger towards my superior" (Anger, reverse coded). Participants rated their level of agreement, post-experiment, to each statement on an 11-point scale with endpoints “Strongly Disagree” (-5) and “Strongly Agree” (+5).

We conduct exploratory factor analysis on our post-experiment questions, and we find Betrayed (reverse coded), Trust, and Anger (reverse coded) represent a single factor. As shown in Table 5 (panel A), all factor loadings are greater than 0.65 and the factor has an eigenvalue (variance explained) of 1.75 (58 percent). Thus, factor analysis indicates that these three questions represent a single construct, which we label Satisfaction.24 We calculate a Satisfaction score for each subordinate as their mean response across these three questions.

Mean (standard error) of Satisfaction by condition is shown in Table 4 (panel B). ANOVA results in panel C of Table 4 show that 1) those in the Adjustment Possible condition experience higher levels of Satisfaction with their superior than those in the Adjustment Not Possible condition (F = 11.68, p < 0.01) and 2) those in the High Identity condition experience

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24 Cronbach’s alpha for Satisfaction is excellent at 0.82 (Kline 2011).
higher levels of *Satisfaction* with their superior than those in the *Low Identity* condition (F = 6.04, p = 0.02). These results suggest that making available and appropriately using ex post adjustment and/or increasing superior-subordinate identity may offer firms long-term benefits by increasing subordinates’ satisfaction with the relationship they have with their superior.

[Insert Table 4 here]

*Normal Period Expectancy and Performance*

Theory underlying H1 applies specifically to tough periods. To test the boundaries of our predicted effects, we examine the effect of possible ex post adjustment and identity on expectancy in normal periods (i.e., periods 1 and 3). We conduct a similar path analysis to the one used to test H1 except we use normal period *Mean Expectancy* and normal period *Mean Performance* as dependent variables. Path analysis results are shown in Table 5, panel A. For those in the *Low Identity* condition, *Adjustment* does not affect *Mean Expectancy* (β = 0.13, z = -0.84, p = 0.40), whereas for those in the *High Identity* condition, *Adjustment* increases *Mean Expectancy* (β = 0.38, z = 2.14, p = 0.04). We conduct a post-estimation non-linear combination test to examine whether these two paths differ significantly from one another. As presented in Table 5, panel B, the *High Identity* path coefficient is not significantly greater than the *Low Identity* path coefficient (Table 5, Panel B: β = -0.55, z = -0.93, p = 0.35). Thus, consistent with theory underlying H1, predicted interactive effects are only found in tough periods and not in normal periods. We also find that, after controlling for the positive effects of *Mean Performance*, *Identity* and *Adjustment* remain unchanged if we control for the positive effect of mean performance across all rounds (p = 0.02) and *Ability* (p = 0.02) in the model. We also conduct an ANOVA with the dependent variable normal periods *Mean Expectancy* and the independent variables *Identity*, *Adjustment*, and *Identity x Adjustment*. Consistent with path analysis results, the interaction from the ANOVA is insignificant (not tabulated: F = 0.87, p = 0.37). Both *Identity* and *Adjustment* are found to have positive main effects on normal period *Mean Expectancy* (not tabulated: F = 4.94, p = 0.03 & F = 4.53, p = 0.04, respectively).
Expectancy (β = 0.86, z = 35.09, p < 0.01), Adjustment negatively affects normal period Mean Performance (β = -0.13, z = -2.17, p = 0.03). This result is consistent with our finding in tough periods that the possibility of an ex post goal adjustment (controlling for its effect via expectancy) could have a negative effect on subordinate effort and performance.

DISCUSSION

In many organizations, superiors can adjust subordinates' performance goals ex post to address negative effects of uncontrollable events (Libby and Lindsay 2010). Unclear is what effect the possibility of ex post adjustment has on subordinates’ expectancy of goal attainment and ultimately, their performance, and what organizational factors moderate this effect. We find the possibility of an ex post goal adjustment can improve subordinate’s expectancy and performance, but only when identity between the superior and subordinate is high. Supplemental analysis supports the idea that this result is driven by the perception of a more positive relationship (indicated by higher trust and lower feelings of anger or betrayal) with the superior in the condition when superior-subordinate identity was high. While the possibility of ex post adjustment reduces performance when superior-subordinate identity is low, high identity appears to mitigate this negative effect by increasing subordinate’s expectancy.

These results have important implications for both theory and practice. Apart from Kelly et al. (2015), no study that we are aware of has examined the effect of possible ex post goal adjustment on performance, and we are the first to examine how identity might affect expectancy

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27 We also conduct an ANCOVA with normal period Mean Performance as the dependent variable, Identity, Adjustment, and Identity x Adjustment as independent variables, and Ability as a covariate. The interaction from the ANOVA is insignificant (not tabulated: F = 1.32, p = 0.25). While Identity does not affect normal period Mean Performance (not tabulated: F = 0.83, p = 0.37), Adjustment does negatively affect normal period Mean Performance (not tabulated: F = 2.88, p = 0.09).
and performance in the presence of such a mechanism. This result echoes the argument made by Gibbs et al. (2004) that increasing subordinates’ faith in their superior’s evaluation increases the benefits and decreases the costs associated with allowing discretionary adjustments. Prior research indicates employees’ identity can positively affect employee behavior and satisfaction (Jones and Volpe 2010); thus, firms may wish to implement organizational practices that build these positive organizational outcomes, particularly if superiors have the discretion to adjust subordinates’ assigned goals ex post. Finally, while many studies have considered how horizontal identities (peer to peer) affect behavior, few studies have considered the effect of vertical identity (superior to subordinate) on subordinate effort and performance (Ashforth et al. 2008). We extend the application of identity theory to common hierarchical relationships within the firm. Our results suggest that allowing superiors the option to adjust subordinates' performance goals ex post when negative uncontrollable events occur is most effective when there is a positive relationship between the superior and his/her subordinates.

As with any study of this type, ours is subject to limitations providing opportunities for future research. First, we restrict the behavior of superiors to allow for a stronger test of theory. However, future research could allow superiors the opportunity to determine both goal difficulty and ex post adjustments. This would provide a more holistic test of the positive and potentially negative effects of high identity when superiors have the opportunity to make ex post adjustments to subordinates' performance goals. Second, we collected four periods of data with two of those periods containing a negative uncontrollable event, and those in the Adjustment Possible condition always receiving a sufficient adjustment. Future research could examine a similar setting where the superior does not always adjust for a negative uncontrollable event or may provide an insufficient adjustment to identify potential boundary conditions on the positive
effect of identity on subordinate performance. Notwithstanding these limitations, our study takes
an initial step toward understanding the impact of allowing superiors discretion over ex post
target adjustment on subordinates’ expectancy and performance during periods when a negative
uncontrollable event occurs.
References


Appendix 1: Concession Task Screen Shot

Practice Round 1

Correct Orders: 0

Small candy,
Large popcorn,
Medium drink
Appendix 2: Identity Riddles

As a team, determine your 3 best guesses at the following riddle and write these 3 guesses in the space provided below (should take about 4 minutes):

I. Which word from Group B belongs with the words from Group A, and why?

   A. BLAST, PAPER, BOX, BANK
   B. JUICE, BAG, CRADLE, CARPET

1. _____________________________________________________________________
2. _____________________________________________________________________
3. _____________________________________________________________________

Answer: Bag because sand can be added to all words to create another word (e.g., Sandblast, Sandpaper, Sandbox, Sandbank, and Sandbag)

II. Which one of the four following words does not belong in this group, and why?

   A. ORIOLE
   B. ORANGE
   C. MONTH
   D. OIL

1. _____________________________________________________________________
2. _____________________________________________________________________
3. _____________________________________________________________________

Answer: Oil because there are no English words that rhyme with oriole, orange, or month, but many that rhyme with oil.
Adjustment is 0 if ex post adjustment is not possible and 1 if ex post adjustment is possible. Identity refers to the level (low to high) of identification a subordinate has with his or her superior. Expectancy of Goal Attainment refers to the subordinate’s belief that they will be able to attain their assigned goal.
**Figure 2: Experimental procedures for participants assigned the subordinate role**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Participants arrive at the lab and are randomly assigned the role of subordinate or superior.</td>
</tr>
<tr>
<td>2.</td>
<td>Participants are seated at computer terminals and introduced to experimental task.</td>
</tr>
<tr>
<td>3.</td>
<td>Participants complete practice period 1 (3 minutes) under piece rate and “normal” period.</td>
</tr>
<tr>
<td>4.</td>
<td>Participants complete practice period 2 (3 minutes) under piece rate and “normal” period.</td>
</tr>
<tr>
<td>5.</td>
<td>Participants move away from the computer to a large table across the room. Subordinates meet their assigned superior and participate in identity manipulation.</td>
</tr>
<tr>
<td>6.</td>
<td>Subordinates move back to computers and complete identity manipulation check.</td>
</tr>
<tr>
<td>7.</td>
<td>Subordinates are introduced to the production period budget-linear compensation scheme.</td>
</tr>
<tr>
<td>8.</td>
<td>Subordinates complete quiz to test for comprehension of compensation scheme.</td>
</tr>
<tr>
<td>9.</td>
<td>Subordinates are introduced to the idea of potential “tough” periods. Possible ex post goal adjustment manipulation is applied.</td>
</tr>
<tr>
<td>9.</td>
<td>Subordinates complete quiz to test for comprehension of “normal” and “tough” periods and ex post adjustment manipulation.</td>
</tr>
<tr>
<td>10.</td>
<td>Subordinates are assigned a performance goal based on their practice period 2 performance.</td>
</tr>
<tr>
<td>11.</td>
<td>Subordinates complete production periods 1 to 4 (each lasting 3 minutes).</td>
</tr>
<tr>
<td>12.</td>
<td>Participants complete post-experimental questions and provide demographic information.</td>
</tr>
<tr>
<td>13.</td>
<td>Participants are paid cash as they leave the lab.</td>
</tr>
</tbody>
</table>
Figure 3: Path Analysis Results

Figure 3 depicts the standardized coefficients and p-values from path model results reported in Table 3. See Table 1 and Table 2 for descriptions of experimental conditions. All p-values are shown two-tailed. We cannot produce RMSEA, CFI, or chi-square statistics because we robust cluster standard errors by work group. However, a similar path model that does not robust cluster standard errors produces almost identical path coefficient results while suggesting our path model fits the data well ($\chi^2 (9) = 11.81, p = 0.22; \text{RMSEA} = 0.09; \text{CFI} = 0.97$). There is no path between Ability and Mean Expectancy because participants are assigned a goal equal to their Ability. Thus, all else equal, expectancy of goal attainment should be equal across ability levels. Path estimates from Adjustment $\rightarrow$ Mean Expectancy of Goal Attainment differ significantly by Identity condition ($z = -2.39, p = 0.02$).
### TABLE 1: Checks on goal assignment and manipulation of Identity [N=78]

#### Panel A: Total number of subordinates by condition

<table>
<thead>
<tr>
<th>Adjustment</th>
<th>Low Identity</th>
<th>High Identity</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not possible</td>
<td>21</td>
<td>18</td>
<td>39</td>
</tr>
<tr>
<td>Possible</td>
<td>18</td>
<td>21</td>
<td>39</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>39</td>
<td>78</td>
</tr>
</tbody>
</table>

#### Panel B: Mean (standard deviation) assigned goal by condition

<table>
<thead>
<tr>
<th>Adjustment</th>
<th>Low Identity</th>
<th>High Identity</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not possible</td>
<td>35.1 (5.5)</td>
<td>33.3 (4.7)</td>
<td>34.3 (5.2)</td>
</tr>
<tr>
<td>Possible</td>
<td>35.8 (3.8)</td>
<td>34.6 (4.2)</td>
<td>35.1 (4.0)</td>
</tr>
<tr>
<td>Total</td>
<td>35.4 (4.8)</td>
<td>34.0 (4.5)</td>
<td>34.7 (4.6)</td>
</tr>
</tbody>
</table>

#### Panel C: Goal attainment count (percentage attainment) by period

<table>
<thead>
<tr>
<th>Adjustment:</th>
<th>Period 1: unadjusted</th>
<th>Period 2: adjusted</th>
<th>Period 3</th>
<th>Period 4: unadjusted</th>
<th>Period 4: adjusted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not possible</td>
<td>32 (82%)</td>
<td>0 (0%)</td>
<td>36 (92%)</td>
<td>1 (3%)</td>
<td>1 (3%)</td>
</tr>
<tr>
<td>Possible</td>
<td>28 (72%)</td>
<td>28 (72%)</td>
<td>32 (82%)</td>
<td>0 (0%)</td>
<td>32 (82%)</td>
</tr>
<tr>
<td>Total</td>
<td>60 (77%)</td>
<td>28 (36%)</td>
<td>68 (87%)</td>
<td>1 (1%)</td>
<td>33 (42%)</td>
</tr>
</tbody>
</table>

#### Panel D: Mean (standard deviation) Identity manipulation check questions

<table>
<thead>
<tr>
<th>Low Identity</th>
<th>Pre-performance</th>
<th>Post-performance</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Possible</td>
<td>-0.19 (1.29)</td>
<td>-0.51 (1.07)</td>
<td>-0.31 (0.89)</td>
</tr>
<tr>
<td>Possible</td>
<td>0.02 (0.87)</td>
<td>0.19 (1.55)</td>
<td>0.17 (1.35)</td>
</tr>
<tr>
<td>Total</td>
<td>-0.09 (1.11)</td>
<td>-0.19 (1.34)</td>
<td>-0.09 (1.14)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High Identity</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Possible</td>
<td>1.80 (0.87)</td>
<td>0.91 (1.18)</td>
<td>-0.89 (0.87)</td>
</tr>
<tr>
<td>Possible</td>
<td>1.86 (0.92)</td>
<td>2.08 (0.80)</td>
<td>0.22 (0.72)</td>
</tr>
<tr>
<td>Total</td>
<td>1.82 (0.89)</td>
<td>1.53 (1.15)</td>
<td>-0.29 (0.96)</td>
</tr>
</tbody>
</table>
Twenty-six of the 104 participants (25%) are assigned the role of superior. Thus, our data analysis is based on 78 subordinate participants. *Adjustment:* subordinates are informed their assigned goal may be adjusted *ex post* for negative uncontrollable events (*Possible*) or goals will not be adjusted (*Not possible*). *Identity:* social connectedness between the superior and subordinate is manipulated to be either high or low.

b Assigned goals are based on each individual participant’s practice period performance. Mean assigned goal does not significantly differ by condition (all two-tailed p > 0.16).

c Goal attainment is 0 if performance is less than the assigned goal and 1 if performance is equal to or greater than the assigned goal. Percent attainment is calculated as goal attainment count divided by cell population.

d Mean *Identity* is the average self-reported responses to three questions *Team, Like,* and *Support* measured on a 7-point scale (-3 to +3) measured prior to the four production periods.
TABLE 2: Tough period descriptive statistics [N = 78]a

Panel A: Mean (standard deviation) *Expectancy of goal attainment* b

<table>
<thead>
<tr>
<th>Adjustment</th>
<th>Low Identity</th>
<th>High Identity</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not possible</td>
<td>3.07 (1.48)</td>
<td>2.69 (1.25)</td>
<td>2.90 (1.38)</td>
</tr>
<tr>
<td>Possible</td>
<td>2.61 (1.28)</td>
<td>3.67 (1.55)</td>
<td>3.18 (1.51)</td>
</tr>
<tr>
<td>Total</td>
<td>2.85 (1.40)</td>
<td>3.21 (1.49)</td>
<td>3.03 (1.44)</td>
</tr>
</tbody>
</table>

Panel B: Adjusted mean (standard deviation) *Performance* c

<table>
<thead>
<tr>
<th>Adjustment</th>
<th>Low Identity</th>
<th>High Identity</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not possible</td>
<td>27.39 (0.57)</td>
<td>26.21 (0.62)</td>
<td>26.08 (0.42)</td>
</tr>
<tr>
<td>Possible</td>
<td>25.65 (0.61)</td>
<td>26.67 (0.62)</td>
<td>26.15 (0.42)</td>
</tr>
<tr>
<td>Total</td>
<td>26.54 (0.42)</td>
<td>26.42 (0.42)</td>
<td>26.52 (0.30)</td>
</tr>
</tbody>
</table>

---

a See Table 1 for descriptions of experimental conditions.

b We measure participants’ *Expectancy of goal attainment* prior to the start of each tough period (i.e., period 2 and period 4) using participants responses on a scale of 1 (strongly disagree) through 7 (strongly agree) to the statement “assuming a more difficult period than normal (i.e., much more 4-item orders then 2-item orders), I will earn a bonus in this period.” We use each participant’s average response to this statement in tough periods to create the variable *Mean Expectancy*.

c *Mean Performance* is calculated as the number of correct orders completed by a subordinate in each tough period (period 2 and period 4) covariate adjusted by subordinate’s goal. See Table 1 for descriptions of experimental conditions.
### Table 3: Tough period path analysis and path comparison \(^a\) [N = 78]

#### Panel A: Path analysis\(^b\)

<table>
<thead>
<tr>
<th>Paths</th>
<th>Unstandardized Estimates</th>
<th>Standardized Estimates</th>
<th>z-stat</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low Identity:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjustment → Mean Expectancy</td>
<td>-0.29</td>
<td>-0.10</td>
<td>-0.73</td>
<td>0.46</td>
</tr>
<tr>
<td><strong>High Identity:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjustment → Mean Expectancy</td>
<td>0.77</td>
<td>0.27</td>
<td>2.19</td>
<td>0.03</td>
</tr>
<tr>
<td>Mean Expectancy → Mean</td>
<td>0.51</td>
<td>0.16</td>
<td>2.61</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability → Mean Performance</td>
<td>0.74</td>
<td>0.80</td>
<td>24.63</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Adjustment → Mean Performance</td>
<td>-0.82</td>
<td>-0.09</td>
<td>-1.46</td>
<td>0.15</td>
</tr>
</tbody>
</table>

#### Panel B: Path comparison\(^c\)

<table>
<thead>
<tr>
<th>Paths</th>
<th>Unstandardized Estimates</th>
<th>Standardized Estimates</th>
<th>z-stat</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment → Mean Expectancy:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Identity vs. High Identity</td>
<td>-1.06</td>
<td>-0.37</td>
<td>-2.39</td>
<td>0.02</td>
</tr>
</tbody>
</table>

\(a\) See Table 1 and Table 2 for descriptions of experimental conditions, *Mean Expectancy*, and *Mean Performance*.

\(b\) All p-values are shown two-tailed. We cannot produce RMSEA, CFI, or chi-square statistics because we robust cluster standard errors by work group. However, a similar path model that does not robust cluster standard errors produces almost identical path coefficient results while suggesting our path model fits the data well (\(\chi^2\) (9) = 11.81, \(p = 0.22\); RMSEA = 0.09; CFI = 0.97). There is no path between *Ability* and *Mean Expectancy* because participants are assigned a goal equal to their *Ability*.

\(c\) Tests whether path estimates from Panel A regarding Adjustment → Expectancy are significantly different between the Low Identity condition and the High Identity condition.
TABLE 4: The effect of possible adjustment and identity on satisfaction\(^a\) [N=78]

Panel A: Exploratory factor analysis\(^b\)

<table>
<thead>
<tr>
<th>Item</th>
<th>Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Betrayed (reverse coded)</td>
<td>0.80</td>
</tr>
<tr>
<td>2. Trust</td>
<td>0.66</td>
</tr>
<tr>
<td>3. Anger (reverse coded)</td>
<td>0.82</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Eigenvalue</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Variance explained</td>
<td>58%</td>
</tr>
<tr>
<td>Cronbach Alpha</td>
<td>0.82</td>
</tr>
</tbody>
</table>

Panel B: Mean (delta standard errors) satisfaction\(^c\)

<table>
<thead>
<tr>
<th>Adjustment</th>
<th>Low Identity</th>
<th>High Identity</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Possible</td>
<td>0.19</td>
<td>0.77</td>
<td>0.46</td>
</tr>
<tr>
<td></td>
<td>(1.78)</td>
<td>(1.78)</td>
<td>(1.79)</td>
</tr>
<tr>
<td>Possible</td>
<td>1.24</td>
<td>3.14</td>
<td>2.26</td>
</tr>
<tr>
<td></td>
<td>(3.16)</td>
<td>(1.88)</td>
<td>(2.69)</td>
</tr>
<tr>
<td>Overall</td>
<td>0.68</td>
<td>2.05</td>
<td>1.36</td>
</tr>
<tr>
<td></td>
<td>(2.53)</td>
<td>(2.17)</td>
<td>(0.28)</td>
</tr>
</tbody>
</table>

Panel C: ANOVA with satisfaction as the dependent variable\(^d\)

<table>
<thead>
<tr>
<th>Source</th>
<th>Df</th>
<th>F</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identity</td>
<td>1</td>
<td>6.20</td>
<td>0.02</td>
</tr>
<tr>
<td>Adjustment</td>
<td>1</td>
<td>11.68</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Identity x Adjustment</td>
<td>1</td>
<td>1.73</td>
<td>0.19</td>
</tr>
<tr>
<td>Error</td>
<td>74</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) Satisfaction is defined as the mean response to the three post-experimental questions on betrayal (reverse coded), trust, and anger (reverse coded). See Table 1 for other variable definitions.

\(^b\) All items measured using a 7-point scale with endpoints labeled “strongly disagree” (-3) and “strongly agree” (+3). Exploratory factor analysis was conducted using varimax rotation.

\(^c\) All p-values are reported two-tailed.
TABLE 5: Normal period path analysis and path comparison \(^a\) \([N = 78]\)

**Panel A: Path analysis\(^b\)**

<table>
<thead>
<tr>
<th>Paths</th>
<th>Unstandardized Estimates</th>
<th>Standardized Estimates</th>
<th>z-stat</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low Identity:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjustment → Mean Expectancy</td>
<td>0.35</td>
<td>0.13</td>
<td>0.84</td>
<td>0.40</td>
</tr>
<tr>
<td><strong>High Identity:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjustment → Mean Expectancy</td>
<td>0.90</td>
<td>0.38</td>
<td>2.14</td>
<td>0.04</td>
</tr>
<tr>
<td>Mean Expectancy → Mean Performance</td>
<td>0.43</td>
<td>0.11</td>
<td>1.95</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Ability → Mean Performance</td>
<td>0.92</td>
<td>0.86</td>
<td>35.09</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>Adjustment → Mean Performance</td>
<td>-1.28</td>
<td>-0.13</td>
<td>-2.17</td>
<td>0.03</td>
</tr>
</tbody>
</table>

**Panel B: Path comparison\(^c\)**

| Paths                                      | Unstandardized Estimates | Standardized Estimates | z-stat | p-value |
|--------------------------------------------|--------------------------|                        |        |         |
| Adjustment → Mean Expectancy:              |                          |                        |        |         |
| Low Identity vs. High Identity             | -0.55                    | -0.25                  | 0.93   | 0.35    |

\(^a\) We measure participants’ *Expectancy of goal attainment* prior to the start of each normal period (i.e., period 1 and period 3) using participants responses on a scale of 1 (strongly disagree) through 7 (strongly agree) to the statement “Assuming a normal period (i.e., same as ratio of 2 item to 4 item orders as the practice periods), I will earn a bonus in this period.” We use each participant’s average response to this statement in normal periods to create the variable *Mean Expectancy*. *Mean Performance* is calculated as the number of correct orders completed by a subordinate in each normal period (period 1 and period 3).

\(^b\) All p-values are shown two-tailed. Path model fits the data well \(\chi^2(9) = 11.34, p = 0.25;\) RMSEA = 0.08; CFI = 0.98. There is no path between *Ability* and *Mean Expectancy* because participants are assigned a goal equal to their *Ability*.

\(^c\) Tests whether path estimates from Panel A regarding Adjustment → Expectancy are significantly different between the Low Identity condition and the High Identity condition.