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When Supervisors Start to Meddle: An Experiment on the Determinants of Intervention

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When Supervisors Start to Meddle: An Experiment on the Determinants of Intervention

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Abstract

In large companies, supervisors are hired to control their subordinates' performance and intervene with risky decisions in order to increase productivity. However, their decision to intervene may not always be profit-orientated. This paper studies whether the decision to intervene in a worker's decision is influenced by psychological factors that are unrelated to the profitability of intervention. In particular, we examine the role of incidental moods and the anticipation of regret triggered by ex-post evaluation of the decision. Intervention behavior is analyzed in a factorial design controlling for two mood conditions (positive, negative) and the presence or absence of feedback on either the efficiency of intervention or on its social (dis)approval by the supervised worker. We observe that supervisors in the negative mood condition intervene less often (approx. 13%) than those in the positive mood condition. Further, when supervisors are later evaluated, they intervene less (approx. 16%). Our observations are consistent with the idea that supervisors' decision are not only driven by payoff but also by incidental moods and regret anticipation. The effects, however, are not statistically significant.

Keywords: intervention, incidental affects, anticipation of regret, decision under uncertainty, group decision-making

JEL-Codes: C91, D81, D82, D83, D91

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1 Introduction

The management of many large companies face challenges to efficiently communicate statues, visions and targets to their work force and to control for compliance. Companies usually act to this problem of asymmetric information by hiring supervisors: since they have a closer hand on their subordinates, they serve as a link between the upper management that take decisions and the work force that carries out these decision. An effective supervisors uses her intervention authority as a mean of productivity enhancement: inter alia, her close relationship to subordinates allows her to promptly identify risky actions of workers and to instantly take efficient corrective measures. However, often companies lack policies ensuring that supervisors do not abuse their power to satisfy personal, often psychological, needs like the desire for control. Consider a manager who played football lost an important match on the week-end. On Monday morning back at the office, still feeling depressed, he starts bullying around with his subordinates and intervene in their decisions, whether justified or not, in order to regain the feeling of being in control. Such behavior is not productivity-enhancing and undesired by both the upper management and the workers.

This paper studies whether supervisors are guided in their intervention decision by psychological motives which do not follow profitability concerns. Two psychological channels that may affect the decision to intervene are examined. First, we study the influence of negative incidental moods[1] which do not arise from the decision to intervene but from outside circumstances. Second, we test whether supervisors shy away from intervention when being confronted with an ex-post evaluation of their decision. Such an evaluation may induce supervisors to anticipate that they may later regret their decision and, thus, cause them to rethink an intervention. To be precise, two types of post-decisional feedback are examined: feedback on the efficiency of intervention (efficiency feedback), which can be thought of as feedback from the upper management, and feedback on the social disapproval of intervention (disapproval feedback) by the supervised worker.

Whether supervisors are influenced by negative incidental moods or the anticipation of regret in their decision to intervene is an empirical question. In this paper, we examine this question with an experiment. Our observations show that those who receive a mood-depressing treatment intervene up to 13% less than those who receive a mood-elevating treatment. Further, we observe that receiving efficiency feedback reduces the intervention rate by 15.87%. Likewise, expecting disapproval

[1] In this paper, the terms moods, affects and emotions are used interchangeably, not minding the distinction made in psychological literature.

feedback from the worker leads to a reduction in intervention by 16.11%. While the observed reductions are sizable and in line with the idea that incidental moods and regret anticipation affect the supervisor's decision, however, they fall short of statistical significance.

Whether moods are truly incidental and not integral—thus not arising from the intervention decision itself[2]— is difficult to control and thus prohibits the use of observational data. Therefore, we designed an experiment where moods are clearly incidental, because they are constructed to be unrelated to the decision to intervene. In order to manipulate the affective state of our supervisors, they were given either negatively framed (Bad News treatment) or positively framed (Good News treatment) information about their career prospect. As subjects tend to draw spurious conclusions from information that is actually thought to be irrelevant, we control for the incidentalness of the mood manipulation: we test whether the framing of career prospects influences the supervisor's expectation that their matched worker performs successfully in the subsequent decision process where he has to solve a logical puzzle. If the expectations turn out to be independent of the mood manipulation, the information about their career prospects can be considered as incidental. Following the mood manipulation, the supervisor has to decide whether to intervene or not: through intervention, she replaces her worker's solution by the correct solution.

Not knowing whether the worker's solution is right or wrong, her intervention decision is under uncertainty. This may induce the supervisor to regret her decision when receiving feedback. Two types of feedback were given: whether the worker has been able to solve the puzzle correctly- in order words whether intervention was needed—(efficiency feedback) and whether the worker has approved of the intervention (disapproval feedback). According to Zeelenberg (1999), the reception of feedback is an antecedent of regret anticipation. By varying the feedback, we isolate the effects of anticipated regret seeking efficiency and anticipated regret arising from social disapproval. In the **Full Feedback treatment**, both type of feedback are given. In the **Rejection Feedback treatment**, supervisors receive only the disapproval feedback. In the **Efficiency Feedback treatment**, only the efficiency feedback is transferred to the supervisors.

Our study contributes to the literature on incidental affects. Recent studies provide evidence for an influence of incidental affects on risk perception (e.g. Johnson

[2]Contrarily to incidental affects, integral affects are usually in line with to the profitability of intervention. A supervisor who is deciding whether to intervene also uses her feelings for the intervention as a valuable source of information.

and Tversky, 1983; Lerner and Keltner, 2000, 2001) or on risk taking behavior (e.g. Yuen and Lee, 2003; Hockey et al., 2000; Mittal and Ross, 1998; Nygren et al., 1996; Leith and Baumeister, 1996; Isen, 1993; Mano, 1992). However, little attention has been granted to studying the effect of incidental affects on the willingness to intervene in teams. A recent study of Neff et al. (2014) examines the influences of positive state affects on the willingness to seek and share information in teams. Allowing for a mix of incidental - ergo team work unrelated - and integral - team work related - affects in their study, the authors find that communication, both information seeking and sharing, is positively correlated with individual positive affects. In contrast, our design clearly identifies the effect of incidental state affects on intervention activity in teams. Pfaff (2012) provide causal evidence for the influence of incidental affects and stress on team communication. He finds that being in a positive mood increases team awareness: subjects in the happy mood condition inform others about their team contribution more frequently than subjects in the negative mood condition. Rather than looking at the quantity of the exchanged information without accounting for its relevance, the study presented here examines whether negative incidental affects reduce supervisors' willing to intervene in the decision of a team member in order to eliminate uncertainty and increase the expected productivity of the team.

Additionally, this paper contributes to the literature on regret theory by studying the influence of post-decisional feedback on intervention behavior. Various experimental studies have shown that the anticipation of regret affects individual behavior. With respect to regret arising from having taken inefficient decisions, studies have been conducted in the context of risk-taking (Zeelenberg et al., 1996), consumer behavior (Inman and Zeelenberg, 2002), bidding behavior in auctions (Filiz and Ozbay, 2007), and in ultimatum games (Zeelenberg and Beattie, 1997). Other studies provide evidence that anticipating social disapproval alters behaviors in cooperative games: in voluntarily contribution games (Rege and Telle, 2004; Masclet et al., 2003; Gächter and Fehr, 1999), coordination games (Dugar, 2010), and trust games (Lumeau et al., 2015). To the best of our knowledge, the study presented in this paper is the first of examine the role of regret anticipation in the context of supervision where supervisors can intervene with a worker's decision at some costs to eliminate risks. This study provides evidence on regret arising from efficiency feedback as well as on regret arising from disapproval feedback.

The remaining of the paper is organized as follows: Section 2 describes the experimental design. In Section 3, hypotheses are derived. Section 4 describes the procedure of the experiment and descriptive statistics. The results are presented in Section 5 followed by a discussion in Section 6. Section 7 concludes.

2 Experimental Design

This paper studies whether the willingness to intervene in a worker's decision is influenced by psychological factors which are unrelated to the profitability of intervention. Two psychological factors are discussed here. First, we test whether negative incidental moods affect supervisors' inclination to intervene. To test this hypothesis, we introduced mood-manipulation treatments (called the News treatments) prior to the intervention decision. Second, this paper studies whether the anticipation of regret has influence on the intervention decision. This research question requires that supervisors are exposed to regret triggers. Ergo, subsequent to the supervisor's decision on intervention, we integrate feedback treatments where supervisors receive feedback on either the efficiency of intervention or the disapproval by the worker.

In the experiment[3] participants are matched in pairs: a supervisor and a worker engage in a decision process where the worker is in charge of finding and submitting the correct solution to a logical puzzle. First, we give a brief description of this decision process. Then, we describe the treatments in detail. Final, we emphasize some important features of the decision process that are required to elicit reliable observations on the intervention decision and to successfully implement the Feedback treatments.

i. The decision process

The experiment was conducted with students from the Paderborn University. Participants are matched in pairs with each consisting of a supervisor and a worker. Roles are assigned randomly. In the decision process the worker is given the task to solve a logical puzzle, while the supervisor has the option to intervene in the worker's solution at some costs and replace it by the correct solution. Both players have a monetary interest in submitting the correct solution: every player receives a role-specific bonus payment if the correct solution is submitted at the end of the decision process. The bonus payment for the supervisor was 2.50 €[4] and for the worker 4 €. For a wrong solution, no player receives a bonus payment. Since decisions made during the decision process generate costs, each player receives a role-specific initial endowment which strictly exceeds those costs in order to avoid

[3]The experiment described in this paper is embedded into another experiment which studies the behavior of the worker. For further information, see Lübbecke and Schnedler (2018).

[4]Payments derived during the experiment are denoted in ECU, and later converted in euros (1 ECU = 5 cents).

bankruptcy. The supervisor receives 5 € as an initial endowment; the worker starts with an endowment of 2 €.

The decision process consists of three stages (see Figure 1). In the first stage, the worker is given a logical puzzle to solve. Her solution is sent off as a submission for both players. In the second stage, the supervisor reads the puzzle and is shown its correct solution. Not knowing the solution of the worker, the supervisor decides whether to intervene. Through intervention, the supervisor automatically replaces the worker's solution, be it right or wrong, by the correct solution. Ergo, intervention assures that the highest payoff is obtained. Intervention is priced at 0.50 € for the supervisor, but imposes no costs on the worker. In the third stage, the worker fixes a reaction to the intervention of the supervisor: she can either accept or reject it. Rejection generates costs of 0.10 € only for the worker. If she rejects the intervention, she disagrees with the replacement of her solution. In this case, two solutions are submitted: the correct solution for the supervisor and the worker's solution. If she accepts, she agrees to the replacement of her solution.

ii. The News treatments

The news treatment aims at manipulating the supervisors' mood before entering the decision process. Previous studies (e.g. Pfaff, 2012; Kirchsteiger et al., 2006) induce a mood manipulation by showing funny, respectively sad, videos to the subjects. In contrast, our subjects receive either depressing or encouraging information on their expected ability to integrate into the labor market after their graduation. In our eyes, this mood-manipulation procedure is more suitable to activate personal distress that triggers the desire for corrective action than confronting subjects with impersonal, though emotional, videos or movies.

Being students from the Paderborn University, the supervisors receive information about their career prospects extracted from the latest alumni study of the Paderborn University 2014. Given the importance of information for their future, we expect these information to be influential. Supervisors in the **Good News treatment** receive positively framed information, heading "Congratulations. Students with your characteristics have good chances at the labor market" enriched with concrete, positively phrased information about employ-ability and high job satisfaction. Supervisors in the **Bad News Treatment** are given negatively framed information, heading "For students with your characteristics the prospects at the labor market do not look that good" with negatively phrased information about challenges to find jobs and lower job satisfaction added below. In both treatments, the given information is correct but oppositely framed. Before receiving the information,

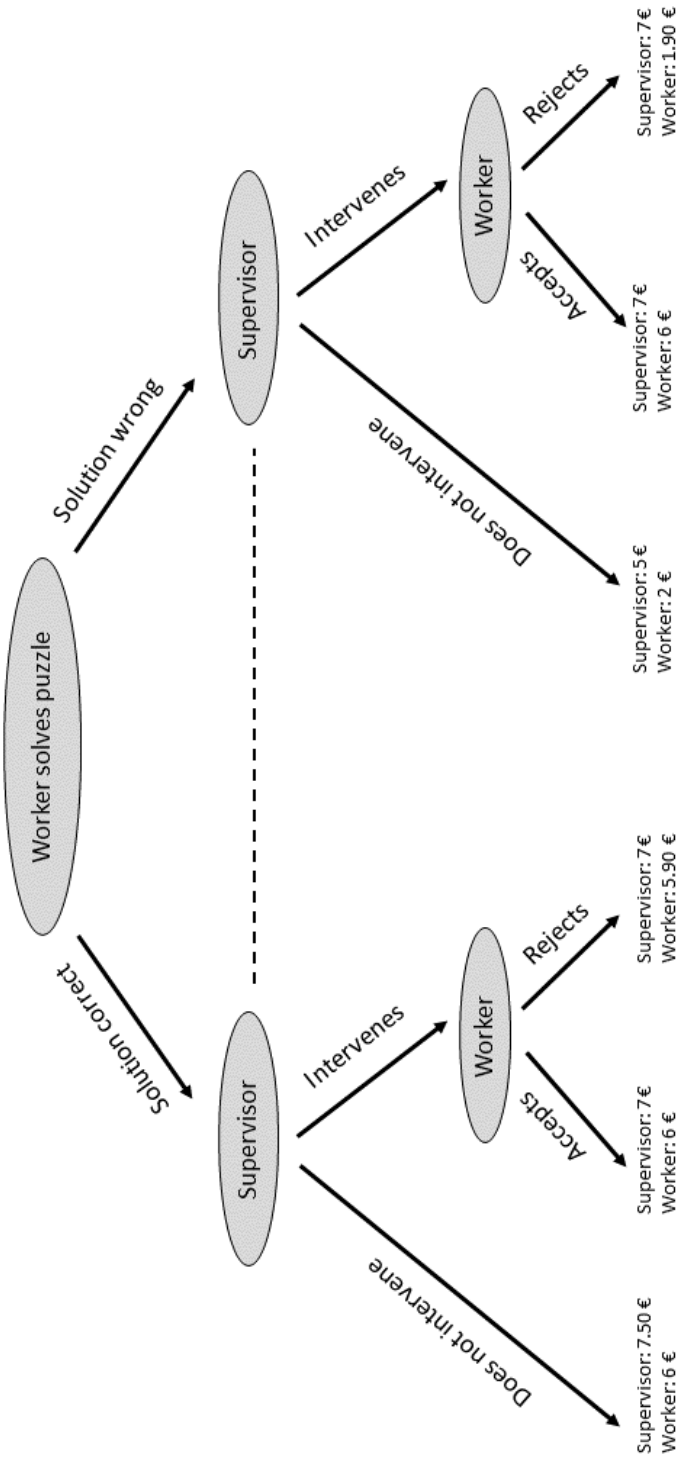

Figure 1: Game Tree with payoffs illustrating the decision process

subjects answer some demographic and study-related questions. However, in order to avoid multiple treatments, the provided information from the alumni study are extracted at the university level and do not regard other personal characteristics as the gender, the faculty or study degree. Hence, information on career prospect are uniform within the treatments. Participants who indicate not to be a student at the Paderborn University are not given any information and are excluded from the data set, since they receive no treatment. Screen shots of the News Treatments are printed in the appendix.

iii. The Feedback treatments

By implementing the Feedback treatments, we vary the scope for anticipating regret. Exposing supervisors to different combinations of regret triggering feedback allows us to test whether intervention reduces when anticipating certain type of regret.

A supervisor who has invested in intervention may later regret to have done so for various reasons. First, she may regret if she learns ex-post that her intervention was not needed and her effort spent in vain. This regret is motivated by efficiency-seeking behavior. Second, she may feel regret if she learns ex-post that others do not appreciate her intervention. This regret is triggered by experiencing social disapproval. For subjects to feel regret, they need to get respective feedback. Here, we design three feedback treatments where supervisors receive efficiency feedback, whether her worker has solved the puzzle correctly, (**Efficiency Feedback (EF) treatment**) or disapproval feedback, whether the worker has rejected her intervention (**Rejection Feedback (RF) treatment**) or both efficiency and disapproval feedback (**Full Feedback (FF) treatment**). Expecting such feedback allows supervisors to anticipate potential regret in advance which may ex-ante alter their willingness to intervene.

The treatments share the same sequences (see Table 7) and differ only with respect to the feedback that is given to the supervisor. Table 1 visualizes the treatment variations. These three Feedback treatments described above were run additional to the Good News treatment, respectively Bad News treatment, which resulted in a 2x3 factorial design. Meaning, every participant received either the Good News treatment or the Bad News treatment and one of the three additional Feedback treatments.

Supervisor receives feedback about ...		... worker's rejection decision	
		YES	NO
... correctness of worker's solution	YES	**Full Feedback treatment:** anticipate regret due to ... **... inefficiency** **... social disapproval**	**Efficiency Feedback treatment:** anticipate regret due to ... **... inefficiency**
	NO	**Rejection Feedback treatment:** anticipate regret due to ... (... inefficiency*) **... social disapproval**	

* The supervisor receives only a noisy signal on the efficiency of her decision.

Table 1: Anticipation of potential regret in the Feedback Treatments

iv. Important features of the decision process

In economic experiments the salience of decisions is one of the key feature. For subjects to state decisions that represent their true preferences, they have to face monetary incentives. However, subjects can only form reliable preferences if they are able to oversee the consequences of their strategies. To avoid ambiguity about the consequences of intervention, a supervisor who intervenes automatically induces that the worker's solution, be it correct or incorrect, is replaced by the correct solution. This automatic replacement is irreversible for the supervisor: A worker who later rejects the intervention can only restore her own solution for herself but not for the supervisor. Consequently, through intervention the supervisor is perfectly sure of receiving her bonus payment of 2.50 €. If she does not intervene, she chooses to rely on the worker's solution which can be correct or incorrect. In this case, she only receives her bonus payment if the worker's solution is correct. Given the costs for intervention, a supervisor should only intervene if she sufficiently mistrusts the worker's ability to solve the puzzle correctly.

A feedback only triggers regret if it provides unpleasant information that is not available otherwise. Without knowing the worker's solution, the decision to intervene becomes a decision under uncertainty. Ergo, the supervisor does not know ex ante whether intervention is efficient. She only learns about its efficiency when she receive the feedback on whether the worker's solution is correct or not. Likewise, supervisors can only learn whether the worker has rejected the intervention, when receiving the disapproval feedback. A supervisor cannot deduce any of these information from her payoff. Thus, the feedback enables her to anticipate regret which she would not anticipate otherwise.

For the feedback on social disapproval to be credible and to be sufficient to trigger regret, supervisors have to anticipate that rejection is likely occur. If rejection by the worker is unlikely, supervisors would also not expect any rejection and, thus, would not anticipate any regret, even though she receives respective feedback. A risk averse worker would only reject intervention if she is aware of its consequences. Otherwise, risk aversion of workers may lead to a reduction in the rejection rate. This would make the occurrence of rejection unlikely. Therefore, we informed the worker about the consequence of rejection. A worker who rejects the intervention receives the bonus of 4 € only if her solution is correct. If she accepts the intervention, she always gets the bonus payment, irrespective of the correctness of her own solution. To be able to fully assess the consequences of rejection, the workers are informed whether their solution has been correct or not before taking the decision.

Last, for the rejection to trigger the feeling that the intervention is not approved, confounding motives have to be ruled out. In our experiment, a worker cannot use intervention as a mean of punishing the supervisor for mistrusting her ability to solve the puzzle, because rejection has no monetary consequences for the supervisor. Neither is the disapproval confounded with other negative consequences beyond the experiment (e.g. restraining an intervening supervisor from acquiring future gains), since decisions are anonymous and no further interaction takes place. Second, as participants are matched anonymously, rejection cannot be motivated by feelings of antipathy. Admittedly, under this procedure the consequences of social disapproval are weak. But it provides a clean measure of the worker's dislike for the supervisor's intervention, as it is not confounded with alternative motives like taking revenge or expressing antipathy.

3 Hypotheses

3.1 The influence of incidental affects on the intervention rate

Most information, we receive in daily life is not purely informative, but also triggers emotions. The information whether one faces challenges when entering the labor market is a good example. Given the importance of this information for our lives, receiving negative career prospects can trigger negative feelings such as fear, anxiety or even anger. Psychological and economic literature provides support for the influence of affects on decisions (e.g. Loewenstein and Lerner, 2003). Especially, when people use heuristics to take decisions, the way they feel about the situation seems to influence their decisions (Forgas, 1995). Following the rules of economic decision-making, a rational individual should only use information which are relevant for their decision. This rule of relevance also applies to affects as far as they arise directly from the decision to be made. These so-called integral affects serve as relevant information when using heuristics (Slovic et al, 2002). In other words, people should only consult their affects as a source of information if and only if they are integral. In opposite, affects that are induced by factors which are unrelated to the decision do not generate any useful information for the decision. Thus, these so-called incidental affects should be ignored by a rational individual.

In this experiment, the affect arising from receiving negative career prospects is incidental for the intervention decision in the subsequent decision process: it is entirely uninformative about the worker's ability of solving the puzzle correctly and, thus, should not alter the supervisor's likelihood of intervention. However,

supervisors may draw spurious inference from their career prospects. A supervisor who has got discouraged about her own success in the labor market, may generally doubt her own abilities and also alter her guess about others performing successfully in a given case. For example, if her own ability is used as a reference point, a discouraged supervisor may also be more pessimistic about the worker's ability to solve the given puzzle. As a consequence, the affect arising from the negative career prospects becomes integral and may influence the perceived value of intervention. To address this point, one has to test whether supervisors' beliefs about the worker's success probability are altered by the News treatments. Our supervisors are asked to assess the probability that the worker has solved the puzzle correctly. If there is no treatment effect on the supervisors' assessment, the affect arising from the reception of negatively framed career prospects can be considered as truly incidental and, therefore, should not affect the supervisor's decision. Accordingly, we postulate the hypothesis ruling under full rationality:

Null Hypothesis (H0: Incidental affects)**.** *Assuming full rationality, the intervention rate is independent of the Good News and the Bad News treatment.*

However, vast evidence is provided that incidental affects seem to influence people's decision and judgment (e.g. Bodenhausen, 1993; Forgas, 1995; Harlé and Sanfey, 2007; Lerner and Keltner, 2000; Loewenstein and Lerner, 2003; Schwarz, 1990; Schwarz and Clore, 1996). Psychologists like Payne et al. (2010), argue that individuals are unable to sufficiently differentiate between incidental and integral affects which can lead to a misattribution of the affect. Psychology provides several models that describe how incidental affects change judgment and decision-making. One acknowledged model is the *feeling-as-information theory* of Schwarz and Clore (1983, 1988). This model allows for the incorporation of integral as well as incidental affects. In essence, it postulates that being in a positive affective state, irrespectively of its source, reduces a person's motivation to process information, since it tells the individual that an environment is benign and secure. Most people are predominantly in a positive mood. Therefore, as an (induced) positive affect matches the prevailing positive mood of most people, it does not call for updating information or any corrective measures. Ergo, supervisors in a positive mood are prone to stick to the default option (Shevchenko et al., 2014; Yen and Chuang, 2008). Contrarily, negative affects make people more alert and, thus, increases the motivation to process information more systematically. Consequently, negative moods increase the inclination to use modes of rational reasoning and, thus, the likelihood to deviate from the default option.

In order to derive a concrete prediction, we have to define the default option in our experiment. Consider how the supervisor perceives her role and her options in

the decision process. In this experiment, the worker is put in charge of finding the correct solution and submitting it. The supervisor has a rather passive, observing role with the opportunity—but not the obligation—to intervene.[5] Being assigned to a passive role, it is most natural to consider the non-intervention option as the default. Other factors promote this perception of non-intervention being the default. Remaining passive is for free, while intervention generates costs of 0.50 €. Further, when the supervisor has to take her decision, she is asked whether she wants to intervene, instead of asking whether she wants to rely on the worker's solution. In our eyes, this question implies that choosing intervention is the deviation from the default of inactivity. Last, in the instructions and the graphic of the decision process handed out to the participants (see appendix), the non-intervention option is presented as the first and straight-forward option, while the option of intervention is presented as one that interrupts the initial process. In a nutshell, supervisors may see themselves in a passive role with the default behavior of being inactive.[6] In economic literature, there is an abundance of evidence that subjects have a preference of staying with the default option (e.g. Beshears et al., 2009; Haward et al., 2012; Johnson et al., 2002; Johnson and Goldstein, 2003; Johnson et al., 1993; Madrian and Shea, 2001).

While non-intervention is considered as the default option, it is also the riskier option in this experiment: a non-intervening supervisor decides to play the lottery of relying on the unknown worker's solution instead of taking the intervention option which guarantees the bonus payment. This is in contrast to most of the existing literature, where the default option of staying in the current state or being reluctant to take action is associated with lower risk. Nevertheless, we argue that the general preference for the default is not entirely removed from the decision process, but only mitigated under a reversed risk structure. Choosing to get active in a decision process is usually a deliberate decision to join responsibility for the outcome, as it is in the study here. Since people shy away from taking responsibility, they prefer to stay passive, even though their participation could potentially reduce risk for all parties.

Considering the non-intervention option as the default, the feeling-as-information theory predicts more intervention in the Bad News treatment where the supervisors

[5]These functions are underlined by assigning significant names to each role: Indeed, our participants only know the roles as the decider (worker) and the observer (supervisor).

[6]We purposely have programmed that the non-intervention option is not marked as the default on the computer screens. In the progress of designing a comprehensive, and clean screen layout, we have used a coding that does not allow to mark a single option as a default. Adding to this, using another coding where setting a default is possible brings about the risk that a supervisor accidentally jumps the intervention decision by prematurely clicking on the forward button.

are exposed to the mood-deteriorating information of having negative future career prospects.

According to a different model, incidental affects may also influence decision making through means of *mood-repair strategies*. People usually aim at maintaining their positive mood. When experiencing a deterioration of their mood through e.g. frustration, fear or anger, people usually take mood-repair strategies to restore a positive mood. For example, frustrated people use aggression to improve their mood (Bushman et al., 2001). People in a negative affective state have need for mood repair and, thus, are more likely to opt for a change of their situation instead of sticking with the default. According to Yen and Chuang (2008), mood-deteriorated people focus intensively on the gains of the alternative option. Vice versa, they are also more sensitive towards the losses which are associated with the omission of getting active. Therefore, supervisors should be more inclined to intervene when experiencing a mood deterioration, e.g. by receiving negatively-framed career prospects. This behavior should be even more pronounced when passiveness results in higher risks and activeness promises a significant gain with certainty.

The hypothesis derived from the approach of mood-repairing is identical to the former hypothesis under the feeling-as-information theory. Consequently, we state the following alternative hypothesis:

Alternative Hypothesis (H1)**.** *Given that incidental affects matter, the intervention rate is higher in the Bad News treatment than in the Good News treatment.*

Other psychological approaches, postulating the no-action option as the default, suggest a hypothesis of opposite direction. First, according to the *mood-maintenance hypothesis*, people in a positive mood behave more risk averse in order to not endanger their positive mood. This makes intervention more attractive than remaining passive, as the intervention option is the safe option in our experiment, while remaining passive exhibits the risk of losing the bonus payment. Therefore, intervention also becomes interesting for supervisors in the Good News treatment.[7]

Second, supervisors who have received the negatively framed job prospects may suffer from *ego depletion*. Negative information induces the need to rethink a

[7] In contrast to other studies, the default option in our experiment is the risky option. Note that reversing the risk structure leads to an oppositely directed hypothesis. If doing nothing is safer, supervisors in the Good News treatment would not have an incentive to deviate from the default option. The resulting hypothesis would thus correspond to our alternative hypothesis (H1) and hypotheses derived from the mood-maintenance approach in other studies (e.g. Yen and Chuang, 2008; Shevchenko et al., 2014).

situation and to evaluate the information, while positive information may not be seen as a deviation from what is expected and, thus, a person can continue with her routine. Ergo, negative information may require more cognitive effort to evaluate the information and self-control effort to deal with negative affects that are attached to this information. Following the ego depletion approach, subjects are less willing or able to exert further energy to engage in cognitive reasoning in the subsequent decision process and, thus, ego depleted people may be more inclined to rely on the default option of inactivity.

Deriving a hypothesis from these two approaches, we state the following conflicting alternative hypothesis:

Alternative Hypothesis (H1')**.** *Given that incidental affects matter, the intervention rate is lower in the Bad News treatment than in the Good News treatment.*

3.2 The role of anticipated regret on the intervention rate

Before deciding to intervene in a worker's decision, a supervisor may ask herself whether her participation is needed or even welcome by others. If this is not the case, a supervisor may ex-post regret her intervention. Anticipating such feelings of regret in advance alter the expected utility of an option and, thus, may induce a supervisor to change decisions. The economists Loomes and Sugden (1982) and Bell (1982) simultaneously developed theoretical decision models where subjects also take anticipated feelings of regret and rejoicing into account when maximizing their expected utility. Various studies provide evidence that the anticipation of regret significantly influences subjects' decision making (for a detailed review see Zeelenberg, 1999).

In this paper, we study two sources of regret that a supervisor may anticipate before getting active. The first source is the psychological impact of forgoing economic payoffs. A rational subject is eager to make an efficient decision. Having taken an inefficient solution burns resources and usually triggers feelings of regret. Thus, she may regret having become active if intervention is not needed and, therefore, inefficient. In our experiment, it is inefficient for supervisors to intervene when the solution of the worker has been correct, because the involved costs are spent in vain. Vice versa, there is also scope for anticipating regret when remaining passive: not intervening is inefficient when the worker's solution is wrong, since the loss of the bonus payment is larger than the costs of intervention.

Second, a supervisor may regret her intervention if she faces social disapproval. When getting active, she steps out of her initial role, joins responsibility and becomes accountable for the outcome. Such an interference with the initial distribution of responsibility is not always welcome by the person(s) in charge, in this case the worker, even though the intervention may be efficient. Therefore, an intervening supervisor exposes herself to the risk that her intervention gets rejected. As people strive for social approval, seeing their intervention being rejected by others is psychologically costly. These costs are amplified if intervention is relatively more helpful to others than to oneself, as it is the case in our experiment.[8] As a result, experiencing opposition against her intervention - especially if it is also seen as an act of help - can cause the supervisor to regret having become active. In this experiment, the worker has the chance to show her disapproval by ex-post rejecting the intervention. Even though, the rejection has no monetary consequences for the supervisor in our experiment, she may incur psychological costs. Anticipating these psychological costs of being rejected reduced the supervisor's propensity to intervene.

A precondition for the anticipation of regret is feedback: people can only feel regret if they learn about the inefficiency or the social disapproval of their decision. As Zeelenberg (1999) points out, "post-decisional feedback is a central determinant of experienced and anticipated regret. When this feedback is present, people anticipate possible regret, but when it is absent regret does not play a significant role in the decision process" (p.103). In this experiment, we designed two types of post-decisional feedback that are given to the supervisors. Under the efficiency feedback, they are informed about the efficiency of their decision by learning whether the worker's solution is correct. This information gives the supervisor a clear signal about whether her decision has been efficient or whether her effort has been spent in vain. Under the disapproval feedback, supervisors are told whether their worker has accepted their intervention. This feedback serves as a direct information on the social disapproval of intervention. Depending on the Feedback treatment, supervisors receive either both or one of these feedback types (see Table 1). Supervisors in the FF treatment are exposed to both types of feedback allowing them to feel regret due to inefficiency and due to social disapproval. In the EF treatment, supervisors receive the efficiency feedback but not the disapproval feedback. Therefore, a supervisor in the EF treatment can only anticipate regret due to inefficiency. In opposite, supervisors in the RF treatment do not get the efficiency feedback. They only receive the disapproval feedback. This feedback serves as a direct information on the social disapproval, on the one hand. On the other hand, it is also a noisy signal for the inefficiency of her decision.

[8]The worker receives 4 € for the correct answer, while the supervisor receives only 2.50 €.

A worker who rejects the intervention, even though her own solution is incorrect, loses her bonus payment. This makes rejection extremely cost. As a consequence, the supervisor is able to draw inference from the worker's rejection decision on the efficiency of intervention. Nevertheless, in the RF treatment she does not have full assurance, contrarily to the other two treatments: as rejection generates costs, the worker may accept out of profit-maximization, even though her solution is correct.

As described above, regret generates only psychological costs. Whether the supervisor receives any of the above described feedback or not, has de facto no influence on the monetary profitability of intervention: the reception of feedback neither changes the consequences of intervention nor its costs. It may only change the perceived profitability of intervention if regret is triggered. When receiving the feedback that the intervention is inefficient, the supervisor learns that a better outcome could have been achieved if she did not intervene. Feedback allows her to compare the actual payoff to the forgone payoff causing her to be less satisfied with the outcome than she could have been in the absence of feedback. Therefore, the presence of feedback triggers a perceived loss which is exclusively psychological. Likewise, the regret that is triggered by social disapproval is only psychologically grounded. Assuming that regret is only psychologically costly, a rational subject who behaves perfectly profit-maximizing should be immune to the anticipation of regret. Thus, post-decisional reception of any type of feedback should not alter her willingness to intervene. Rather, a profit-maximizing supervisor is expected to choose the option that generated the highest expected payoff for the given payoff structure and her subjective probability that the worker solves the puzzle correctly. Consequently, we state the following null hypothesis ruling under the rationality assumption of profit-maximization:

Null Hypothesis (H0': Feedback)**.** *Given that supervisors behave perfectly profit-maximizing, the intervention rate is identical across all Feedback treatments.*

Observations from behavioral economic studies have proven that subjects do not behave perfectly profit-maximizing, but also account for psychological benefits and costs which causes them to forfeit monetary profits. Zeelenberg et al. (1996) provide evidence that subjects behave regret averse: subjects tend to minimize the psychological costs of regret instead of maximizing profits. For our experiment, the idea of regret aversion suggests that intervention becomes less attractive for supervisors when feedback exposes them to the anticipation of regret. Assuming that subjects are simultaneously receptive to different types of regret, more feedback should increase the scope for anticipating regret and, thus, reduces the willingness to intervene. Consequently, we hypothesize that the intervention rate is lowest in

the FF treatment where supervisors anticipate the highest degree of regret, as they are clearly exposed to both types of feedback.

Alternative Hypothesis (H2)**.** *Given that supervisors take post-decisional regret into account, the intervention rate in the FF treatment is lower than in the RF and EF treatments.*

No hypothesis on the difference in intervention rates between the RF and EF treatment is made, since this would require strong assumptions on the quality of different types of regret.[9]

4 Procedure and Descriptive Statistics

The experiment was run in the BaER-Lab laboratory at Paderborn University in March and May 2016. 12 sessions were conducted. Each session was assigned to one of three Feedback treatments. The News treatments were simultaneously run within a session. The numbers of participants were mostly balanced across the treatments and treatment combinations (see Table 2) ranging from 18 to 23 observations per treatment combination. A session took between 48-61 minutes excluding the time for paying the participants. The experiment was computerized using the software z-Tree (Fischbacher, 2007). All subjects were recruited from the same subject pool via ORSEE (Greiner, 2015). Every subject could participate in only one session. Those who already participated in March 2016 were not re-invited in May 2016.

In total, 244 participants took part in the experiment. As they were matched in pairs, half of them acted in the role of a supervisor. Therefore, the data set consists of 122 independent observations derived from those participants assigned to the role of the supervisor.[10]

[9] Whether regret arising from economic losses is more or less deterrent than regret from social disapproval, should be highly subjective as well as context-bound. Only if economic losses and social disapproval trigger regret of equal size, one could predict that the intervention rate in the RF treatment should be lower than in the EF treatment. Note that the disapproval feedback in the RF treatment also serves as a noisy signal for the inefficiency of intervention. However, given the strong assumption of equal quality of these types of regret, we do not formulate any hypothesis here.

[10] There was no supervisor who indicated to be not a student of the Paderborn University. Thus, no observations was deleted, since all supervisors received a News treatment.

	Bad News Treatment	**Good News Treatment**	Total
RF Treatment			
Observations	23	22	45
Female participants (in %)	34.78	36.36	35.56
Payoff in €	9.26	9.64	9.44
FF Treatment			
Observations	20	19	39
Female participants (in %)	40.00	26.32	33.33
Payoff in €	9.53	9.18	9.36
EF Treatment			
Observations	18	20	38
Female participants (in %)	72.22	30.00	50.00
Payoff in €	9.28	9.40	9.34
Total			
Observations	61	61	122
Female participants (in %)	47.54	31.15	39.34
Payoff in €	9.35	9.42	9.39

Table 2: Summary Statistics

The recruited subjects had different study backgrounds: 47.54% of the supervisor intended to get a teaching degree, 31.97% were registered at the faculty of Business Administration and Economics, the remaining participants enrolled in other study fields, such as cultural sciences, natural sciences or engineering, computer sciences and mathematics. In total, 39.34% of the supervisors were female. However, the female participation rate varied strongly across the treatment combinations (see Table 2). When analyzing the data, we consider this imbalance.

During the experiment, subjects received their payments in ECU which were converted in euros (1ECU = 5cents). Additionally, subjects were paid a fixed participation fee of 2.50€. All payments were handed out in cash at the end of each session. On average, a supervisor received 9.39€. Subjects were provided with printed instructions explaining the experiment. Supervisor and worker received identical instructions. In order to ensure that all subjects had comprehended the instructions, they had to answer control questions before starting the experiment. Subjects could not proceed with the experiment, unless they answered all questions correctly. After the experiment, subjects answered a survey with socio-demographic questions and questions concerning the experiment and their behavior within.

5 Results

This section presents the results. First, we study the effect of receiving negatively framed career prospects on supervisors' willingness to intervene in a worker's decision. Precisely, we ask whether supervisors in the Bad News treatment intervene more often than supervisors in the Good News treatment. Second, we address the question whether anticipating regret deters supervisors from intervention. In other words, we test whether the intervention rate is lower in the FF treatment, where the supervisors receive two types of feedback - on the efficiency and social disapproval of intervention, than in the other treatments (EF and RF treatments) where only one type of feedback - either efficiency or disapproval feedback - is given to the supervisors.

5.1 The influence of incidental affects on the intervention rate

In the Hypotheses section, we postulated that affects arising from negative career prospects are purely incidental and, thus, uninformative. However, it has to be tested whether this is true. If it turns out that supervisors draw spurious inference from their personal career prospects on the worker's ability to perform in the puzzle

task, the affect arising from the reception of negatively framed career prospects cannot be considered as incidental. To address this point, our supervisors are asked to assess the probability that the worker has solved the puzzle correctly. The results from a two-sample Wilcoxon rank-sum (Mann-Whitney) test shows that supervisors in the Bad News treatment do not make significant different assessment on the worker's ability than supervisors in the Good News treatment (p=0.3837). Not only is the difference not significant, it also points the opposite direction as expected: supervisors in the Good News treatment are slightly more pessimistic about the worker's ability than supervisors in the Bad News treatment. Supervisors do not seem to link their negative career prospects to the worker's ability to successfully perform in the puzzle task. Ergo, the affect arising from the negative career prospect seems to be irrelevant for the supervisor's intervention decision and can thus be considered as incidental.

Let us first consider the null hypothesis (H0: Incidental affects). Table 3 shows that the difference is quite sizable: looking at the entire data set, the intervention rate in the Bad News treatment is almost 12% lower than in the Good News treatment. An illustration of the intervention rates is given in Figure 2. This finding is not significant (Fisher's exact test, p=0.264) and is even in the opposite direction of our first alternative hypothesis (H1) which postulates that if incidental affects matter, the intervention rate in the Bad News treatment should be higher than in the Good News treatment. In this experiment, we rather observe that incidental affects seem to work in the opposite direction, as it was postulated by our second alternative hypothesis (H1'). This result is consistent across all Feedback treatment variations: for all feedback treatments, the intervention rate in the Bad News treatment is between 9% and 13% lower than in the Good News treatment (Fisher's exact tests, the p values are between 0.527 and 0.734; see Figure 2). In a nutshell, if incidental negative affects matter at all, they rather may discourage supervisors from intervening in a worker's decision.

A Linear Probability Model (LMP) regression is run (Table 4) that does not only account for the size of the effects in the News Treatments and the Feedback treatments but also for the interactions of them, as every supervisor has received a combination of one News treatment and one Feedback treatment. The reference group consists of supervisors who have received the Bad News treatment and the FF treatment. The results of the LPM shows that there is no statistically significant increase in intervention for those supervisors who have participated in the FF treatment and received the Good News instead of the Bad News treatment (see Table 4; p=0.413). Likewise, being in the RF treatment, respectively the EF treatment, receiving the Good News instead of the Bad News treatment does not significantly change the intervention rate. Therefore, we cannot reject our null hypothesis (H0:

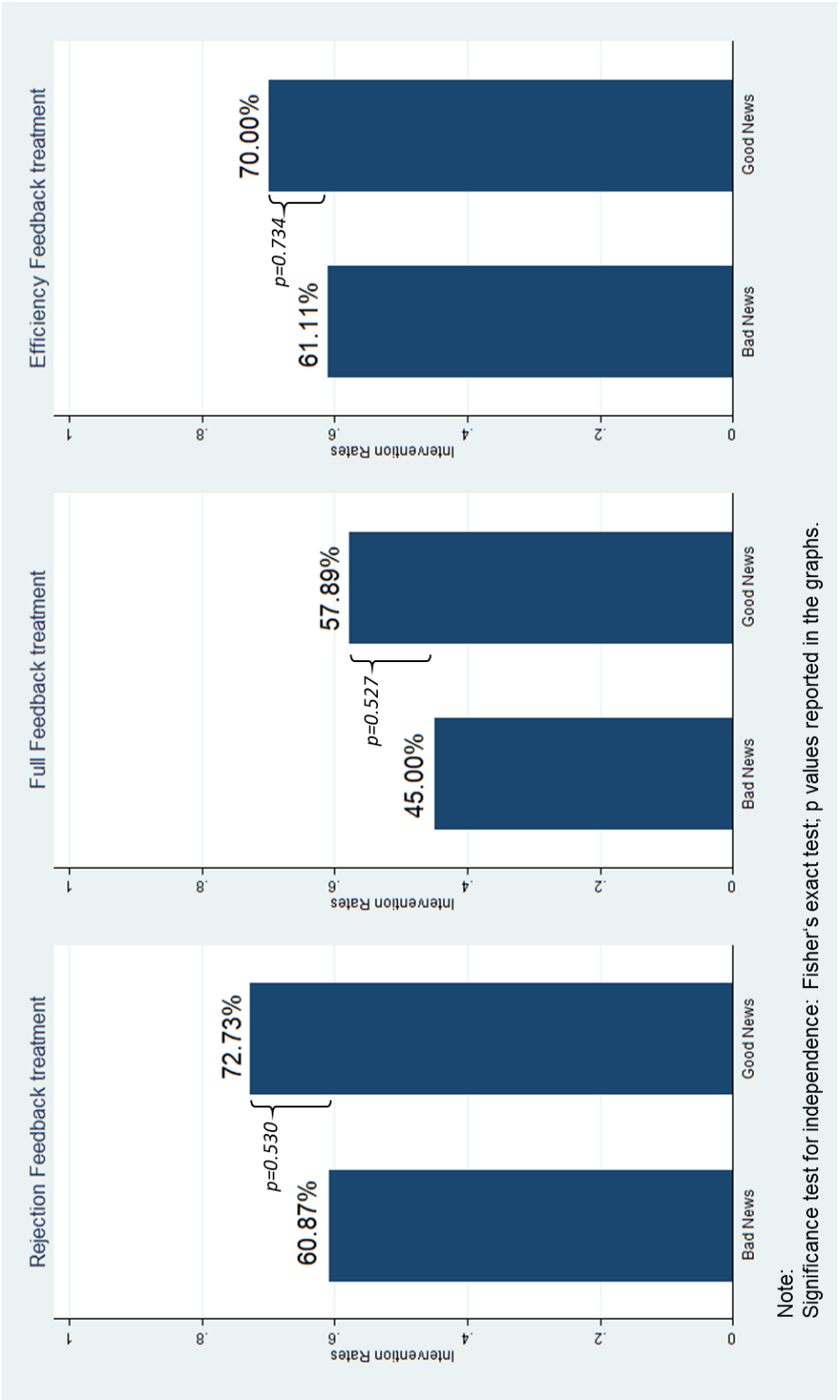

Figure 2: Intervention Rates in the Feedback Treatments, by News treatments

Table 3: Intervention Rates per treatment

	Bad News Treatment	**Good News Treatment**	Total
Rejection Feedback Treatment	60.87%	72.73%	66.67%
	(14/23)	(16/22)	(30/45)
Full Feedback Treatment	45.00%	57.89%	51.28%
	(9/20)	(11/19)	(20/39)
Efficiency Feedback Treatment	61.11%	70.00%	65.79%
	(11/18)	(14/20)	(25/38)
Total	55.74%	67.21%	61.48%
	(34/61)	(41/61)	(75/122)

incidental affects).

Result 1. *The intervention rate in the Bad News treatment is on average 9% to 13% lower than in the Good News treatment. While the difference is sizable, it is not statistically significant.*

To account for the large imbalance of female participation across the EF treatment combinations (see Table 2), the LPM was extended by adding controls. This specification leads to only minor changes. (The results are available on request.)

5.2 Anticipating regret: the effect of feedback on the intervention rate

In this section, we test whether the anticipation of regret reduces a supervisor's inclination to intervene in a worker's decision. In the Hypotheses section, we postulate that supervisors should be less inclined to intervene, the more they are confronted with feedback that causes them to regret their decision. Assuming that different types of regret do not cancel out each other, we predict that the intervention rate should be lowest in the FF treatment where both type of feedback

Table 4: Linear Probability Model

Dependent variable	1 if supervisor decided to intervene
Good_News_treat	.1289
	(.1571)
RF_treat	.1587
	(.1499)
EF_treat	.1611
	(.1593)
Good_News*RF_treat	-.0104
	(.2147)
Good_News*EF_treat	-.0401
	(.2238)
cons_	.4500***
	(.1097)
N. obs.	122
R^2	0.0343

Notes: Linear Probability estimates. Robust standard errors are in parentheses. The reference group are supervisors in the Bad News treatment who also receive the FF treatment.
* significant at p<0.10; ** significant at p<0.05; *** significant at p<0.01

are shared.

Indeed, looking at Table 3 and Figure 3 displays that the intervention rate in the FF treatment is lower than in the RF treatment and EF treatment irrespective of the News treatment. In the Bad News treatment, the intervention rate is 15.87% higher in the RF treatment and 16.11% higher in the EF treatment than in the FF treatment (Fisher's exact tests, p=0.366, respectively 0.352; Figure 3). Under the Good News treatment, the differences are in the same direction as under the Bad News treatment but less pronounced: 14.84% higher in the RF treatment and 12.11% higher in the EF treatment (Fisher's exact tests, p=0.346, respectively 0.514; Figure 3). This finding is in conflict with our null hypothesis (H0': Feedback). Though, the results are statistically not significant.

The LPM (Table 4) confirms that the results are statistically not significant for both types of feedback (p=0.292 for the RF treatment; p=0.314 for the EF treatment). Ergo, we cannot rule the possibility out that the observed reduction in intervention is due to random behavior. In other words, we cannot reject our null hypothesis (H0': Feedback).

Result 2. *The intervention rate in the FF treatment is on average lower than in the RF treatment and EF treatments. While the differences are sizable (approximately 16% in both cases under the Bad News treatment), they are not statistically significant.*

6 Discussion

In this section, our results are discussed. Then, the psychological approaches presented in the Hypotheses part are reviewed with respect to their ability to explain our results on incidental affects.

For the Bad News treatment, we observe an intervention rate which is on average between 9% and 13% lower than for the Good News treatment. While the effect is quite sizable, our finding falls short of statistical significance. Hence, if negative incidental affects matter, they may have a rather hampering than promoting effect on supervisors' willingness to intervene. Among those who would intervene in a worker's decision if being in a positive mood, approximately every eighth (EF treatment) to fourth supervisor (FF treatment) would not do so if being in a negative mood. In the authors' eyes, this magnitude is economically significant. For the role of feedback on intervention, our observations draw a similar picture. If receiving

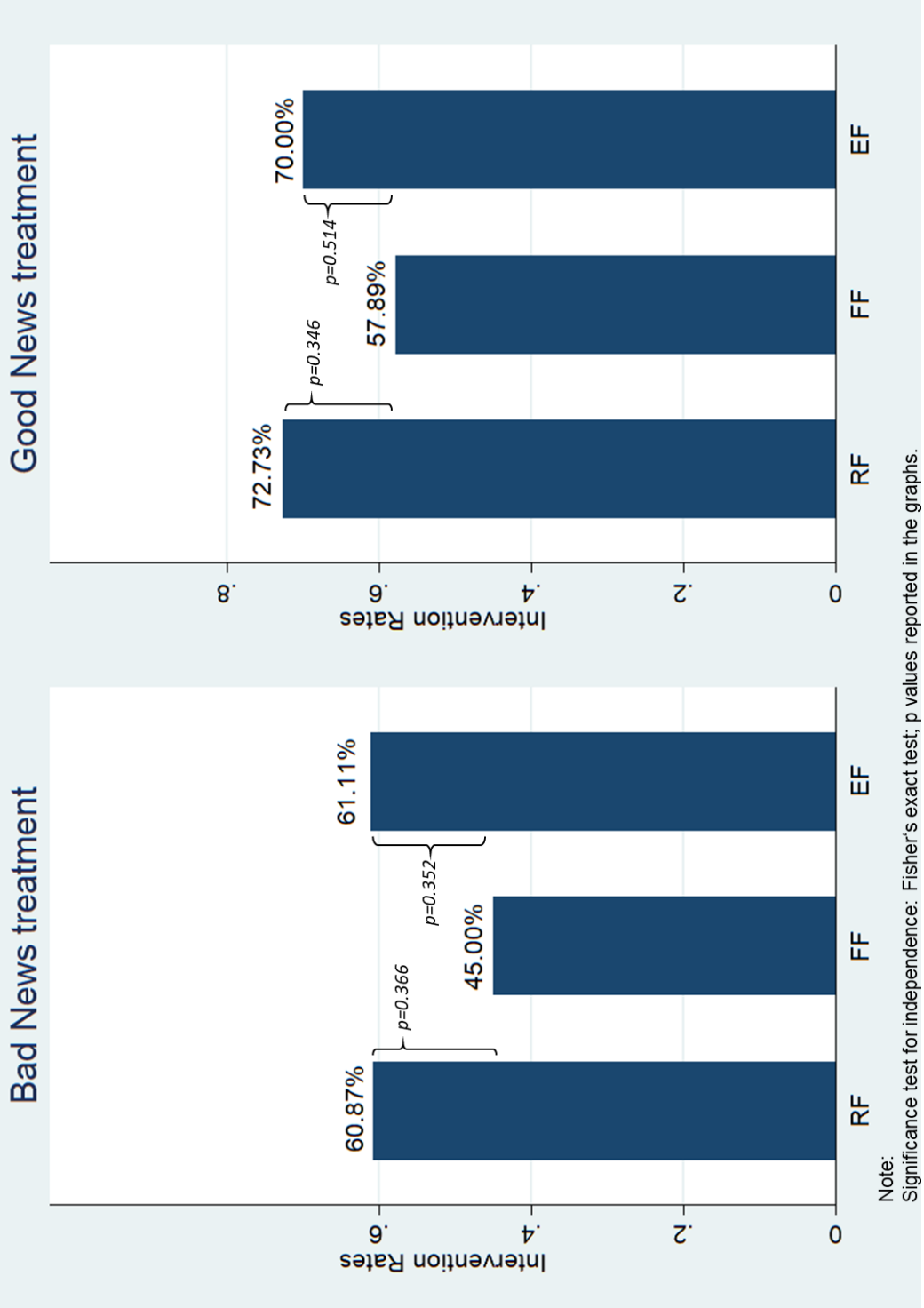

Figure 3: Intervention Rates in News Treatments, by Feedback treatments

feedback that triggers the anticipation of regret influences supervisors in their intervention decision, it may discourage supervisors from intervening. We find that the intervention rate in the FF treatment is approximately 16% lower than in the EF, respectively in RF treatment. Stated differently, among those who would be willing to intervene, round about every fifth (Good News Treatment) to more than every fourth supervisor (Bad News treatment) would not do so if they were exposed to more feedback.

While the effects are large in magnitude, we cannot exclude that our observations are due to random behavior given the lack of significance. Nevertheless, the relative small sample size resulting from comparing subgroups (n=23 for the largest subgroup, see Table 2) may contribute to the low level of significance. Unfortunately, the available subject pool prohibits to extend the data set. Indeed, to obtain the number of observations used in this present study, we exhausted the sizable subject-pool of the BaER-Lab. Given the response rate at the time of conducting the experiment, we were able to recruit 244 students with half of them acting in the role of a supervisor.

The results on incidental affects indicate that if negative incidental affects matter at all, they may induce supervisors to intervene less. This is in opposite to the hypothesis (H1) derived from the psychological models of the *feeling-as-information theory* and the *mood-repair hypothesis*. Therefore, these approaches alone do not seem to explain the observed behavior. If the behavioral pattern described by these approaches is counteracted by the *mood-maintenance strategy* of mood-elevated supervisors in the Good News treatment, it would not be surprising that the treatment effect turns out to be statistically not significant, since these approaches predict opposing behavioral patterns. Ergo, supervisors in both treatments could have an incentive to deviate from the default. Further research is needed to test whether mood-maintenance by mood-elevated supervisors and mood-repair by depressed supervisors are simultaneously at work.

A more promising explanation for our results may be given by the *ego depletion* approach. One indicator for the existence of ego depletion could be the variance in the supervisors' assessments on the worker's ability to successfully perform in the puzzle task. Supervisors are asked to rate the probability that the worker's solution is correct at a scale from 0 (100% incorrect) to 10 (100% correct). If supervisors in the Bad News treatment suffer from ego depletion, the assessments in this treatment are expected to show a greater variance than the assessments made by supervisors in the Good News treatment, since ego depleted subjects are usually less able to make correct estimations. A visual test of Figure 4 suggests that the variances of assessments differ across the News treatments. In a nutshell, there is

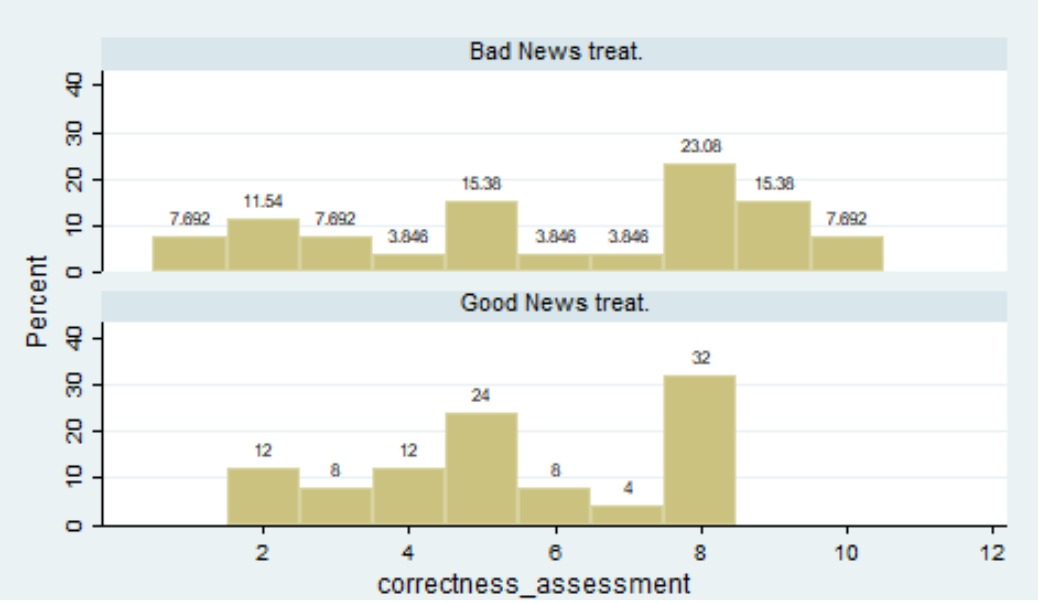

Figure 4: Superviors' assessments about the correctness of the worker's solution

vague indication that supervisors in the Bad News treatment could suffer from ego depletion. Though, further research is needed to confirm this idea.

7 Conclusion

This paper explores two channels which may cause supervisors not to intervene in a worker's decision. First and primary, it is studied whether negative incidental affects have an effect on the willingness to intervene. Our results suggest that if negative incidental emotions matter at all, they have a rather hampering effect on a supervisor's inclination to intervene: in the mood-depressing Bad News treatment supervisors intervene 9% to 13% less than supervisors in the mood-enhancing Good News treatment. This proportion is sizable and economically relevant. Though, it is not statistically significant.

We argue that the psychological theory of *feeling-as-information* of Schwarz and Clore (1983, 1988) and the *mood-repair hypothesis* do not sufficiently predict the influence of incidental affects on intervention behavior. Instead, *ego depletion* might be a possible explanation why supervisors decide to remain passive after suffering from mood-depressing but unrelated incidences. Additionally, attempts of *mood-maintenance* by supervisors in a positive mood may increase the rate of

risk-reducing intervention. This would confound with mood-repairing behavior by depressed supervisors in our experiment who are expected to opt for intervention as a corrective action. Further research is needed to study whether these confounding forces are simultaneously at work. If so, this may contribute the low significance of our results.

Second, this paper studies the role of anticipating regret on a supervisor's willingness to intervene. Our results suggest that if feedback has an influence on supervisors at all, it rather reduces their willingness to intervene: we observe that supervisors intervene less (approximately 16% for depressed supervisors) when they are exposed to regret triggering feedback—be it on the efficiency or the social (dis)approval of intervention. However, the effects are not statistically significant. Considering the disapproval feedback, the null result might be the consequence of the relative weak implementation of social disapproval in our design. As described in the Experimental Design part, we purposely decided on a procedure that measures social disapproval in a very clean way: by excluding other influences that usually come along with social disapproval, we are able to measure the pure effect of fearing others' rejection. Though, the cleanness of this procedure is bought at the price of a weak implementation. It should be clear to the reader that in real situations where people cannot hide behind the veil of anonymity and probably face future interactions, the effect is expected to be much stronger. In this sense, the results derived from this experiment could be regarded as a the lower bound.

Given that the observed effects are statistically weak, we cannot reliably recommend concrete policy measures. Further research is needed to provide more insight into the role of incidental emotions and anticipation of regret for intervention.

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Appendix

Original screen shots in German with translation

The Bad News treatment

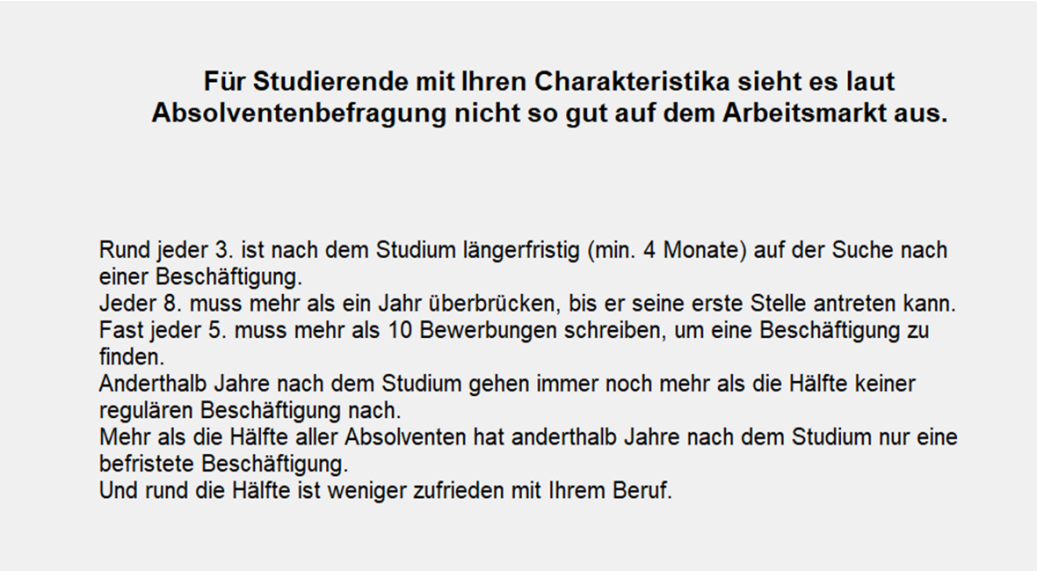

Figure 5: Original screen shot: Bad News treatment (German)

English translation:

"For students with your characteristic it does not look that good at the labor market according to the alumni study.

Round about every 3rd person has been searching long-term (at least 4 months) for an employment after studying.
Every 8th person has to bridge a year before starting the first job.
Almost every 5th has to write more than 10 applications to find an employment.
One year and a half after graduation more than half do not have a regular employment.
More than half of the alumni only have a limited contract one year and a half after graduation.
And round about half are less satisfied with their job."

The Good News treatment

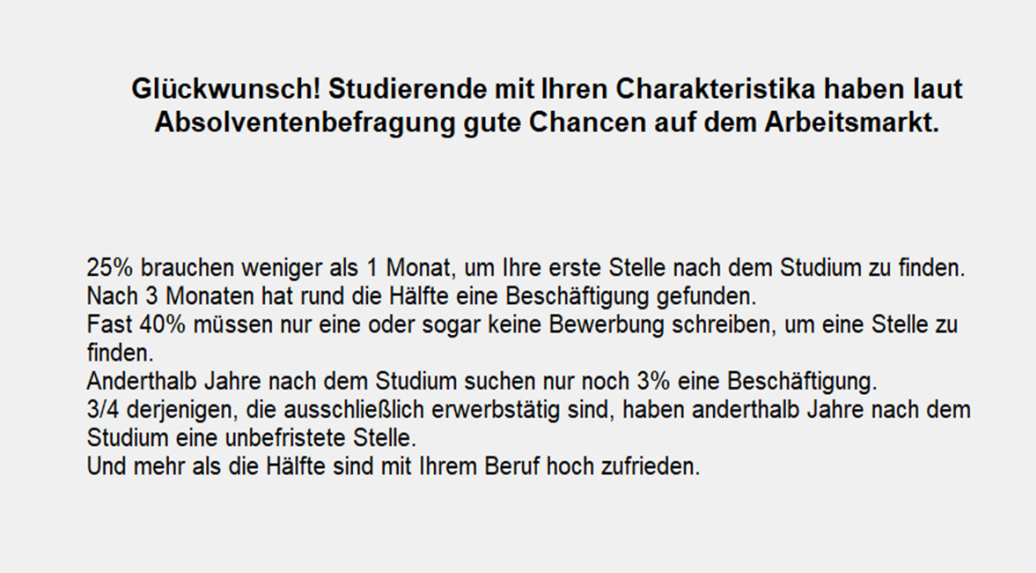

Figure 6: Original screen shot: Good News treatment (German)

English translation:

"Congratulation! Students with your characteristics have good chances at the labor market according to the alumni study.

25% need less than a month to find the first job after the studies.
After 3 months round about half have found an employment.
Almost 40% have to write only one or even no application to find an employment.
One year and a half after graduation only 3% are looking for an employment.
3/4 of those, who are exclusively gainfully employed, have an unlimited contract one year and a half after graduation.
And more than half are highly satisfied with their job."

Graphic illustrating the decision process—translated into English

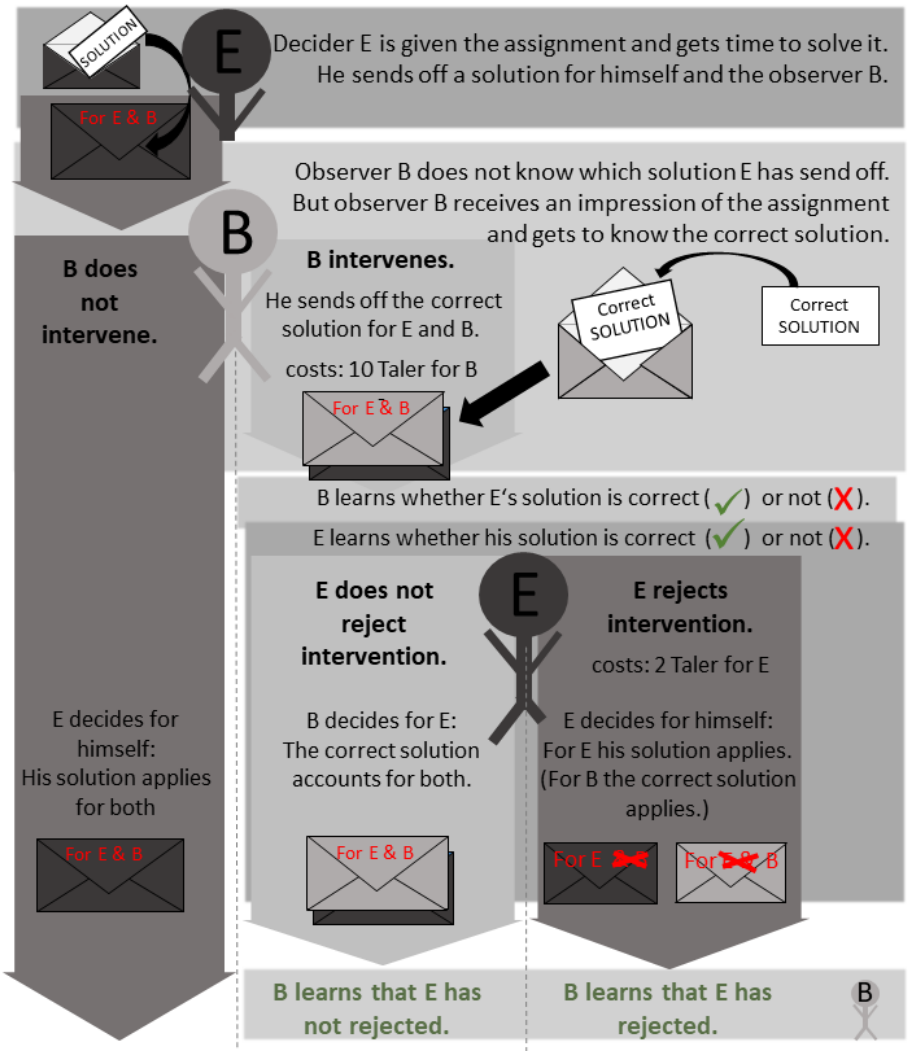

Figure 7: Graphic of the decision process, handed out in the FF treatment

Supervisors in the RF treatment and EF treatment received a graphic which is identical except for the necessary treatment variations. Note that our participants know the roles in the decision process as the observer (supervisor) and decider (worker).