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Mistakes at work are judged more negatively in routine tasks than in complex tasks

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# **MISTAKES AT WORK ARE JUDGED MORE NEGATIVELY IN ROUTINE TASKS THAN IN COMPLEX TASKS**

**Tim Hampel**

## **ABSTRACT:**

Mistakes at work can lead to learning and personal development or can massively harm one's professional career. How a mistake affects a professional career often depends on how it is perceived by involved individuals (e.g. supervisors). In the present study we investigate two different types of mistakes at work: mistakes in routine and complex work tasks. In two experiments with 192 alumni of a German university we tested whether mistakes in routine tasks are judged differently than mistakes in complex work tasks. Results revealed that mistakes are judged significantly more negative when occurring in a routine work task compared to a complex work task. The results of our study give rise to a dilemma of mistakes at work where on basis of dual process theories mistakes are more likely to happen in routinized tasks while at the same time these mistakes are judged more negatively. We discuss an intervention to resolve the dilemma and suggest avenues for future research alongside the limitations of our study.

## **KEYWORDS:**

mistakes at work, errors, failures, attitudes towards mistakes, career development

**JEL classification: JEL: M**

## **AUTOR:**



***Prof. Dr. Tim Hampel** ist Professor für Betriebswirtschaftslehre an der IU Internationale Hochschule am Standort Ulm. In seiner Forschung verbindet er wirtschaftliche und sozialpsychologische Fragestellungen. So untersuchte er beispielsweise, wie Innovationsprozesse durch persönliche Einstellungen von Mitarbeitenden verlangsamt oder aufgehalten werden und durch welche Methoden externes Wissen in Unternehmen integriert werden kann.*

## Introduction

In every realm of professional life mistakes can happen and — most probably — will happen during the course of a career. The nature of mistakes at work is as varied as the professions themselves. However, in most occupations there are tasks or procedures of repetitive nature that become habitual over time (i.e. routines) (Porath & Erez, 2009; Rerup & Feldman, 2011). The essence of a routine is its repetitive pattern of predictable actions and events (Avni-Babad & Ritov, 2003). In fact, in most occupations parts of the job are routines or become routinized over time whereas other tasks are more complex and require a continuous development of skills and procedures (Deken et al., 2016; Seijts & Latham, 2001). Especially in the realm of innovation, there are complex tasks and projects that require new methods or procedures in order to succeed (Han & Nielsen, 2018; Reid & De Brentani, 2004). Imagine a physician for example, who is confronted with a routine operation she has conducted multiple times and a seldom complicated surgery at the same day, or an engineer trying to solve a complex mechanical problem and regularly must keep management up to date with a regular report. For both occupations, mistakes can happen in the routine as well as in the complex task. While most managers postulate innovative endeavors require trial and error whereas standardized tasks should be carried out with accuracy (Rhaïem & Amara, 2021; Sosna et al., 2010; Weinzimmer & Esken, 2017), how do evaluators (e.g. from the perspective of a supervisors) assess mistakes in a routine vs. a complex task? That is, how is their attitude towards mistakes that happen in a task that is conducted on a regular basis and is foreseeable vs. a non-routine task that requires new procedures or skills. To add to the literature on mistakes at work, we conducted two experiments where we presented 192 alumni of a German university short cases of mistakes at work. In the first experiment, we manipulated the nature of the task (routine vs. complex) and in the second experiment we presented cases of work activities that are either associated with a routine or a complex task. Afterwards, we measured the attitudes of the subjects towards the respective mistakes. In doing so, we hope to shed some light on the perception of different mistakes in everyday work life. Literature review and hypothesis

## Literature review and hypothesis

Since mistakes are human, various research streams have investigated mistakes at work such as management and organizational science, psychology, or neuroscience where terms such as failure, mistakes, errors, obstacles, and struggle are often used interchangeably (Cohee & Barnhart, 2023; Frese & Keith, 2015; Simpson et al., 2020). Management and organizational research for example has examined organizational factors and leadership skills relevant in the process of dealing with mistakes at work. Under the umbrella term of learning from mistakes, factors such as organizational culture, feedback, reflective practice, cooperative team goals, viewing mistakes as opportunity, or mistake tolerance has been investigated (Cannon & Edmondson, 2005; Dahlin et al., 2018; Gu et al., 2013; Tjosvold et al., 2004; Weinzimmer & Esken, 2017). Research in psychology, on the other hand, has investigated inter- and intrapersonal factors such as mistakes and team performance, coping with mistakes, heuristics, or cognitive fatigue (Edmondson & Lei, 2014; Finkelstein & Sanford, 2000; Gigerenzer & Gaissmaier, 2011). Edmondson (1999) for example introduced the term psychological safety in her seminal work as a shared belief held by members of a team that the team is safe for

interpersonal risk taking and demonstrated a positive relationship on learning behavior and performance in organizational work teams. However, relatively little is known about how mistakes at work are perceived by colleagues, managers or involved persons. For example, it was found that mistakes by leaders exert damaging effects on perceptions of leaders who commit them. Those who made mistakes were viewed as less task and relationship competent, desirable to work for, and effective than leaders who did not (Thoroughgood et al., 2013). Also it was observed that patients who responded that a physician had made a mistake, these perceptions had a concrete effect on the physician-patient relationship, often leading patients to seek another health care professional (Kistler et al., 2010). Furthermore, Bührke et al. (2021) discovered that typing errors in human-computer chatbot interfaces were perceived not as more human like but as a lack of developer competence and de Sá Siqueira et al. (2023) found that chatbot mistakes have a negative effect on users' perceptions of ease of use, usefulness and enjoyment. Given the previous research, the question remains if mistakes at work are judged differently knowing that it was a routine vs. complex task in which the respective mistake happened. In light of the expectation–confirmation theory (ECT), individuals have specific expectations about a phenomenon or object, and their attitudes towards it are shaped by the extent to which their expectations are confirmed or disconfirmed (Oliver, 1977, 1980). The ECT's theoretical foundation is rooted in social psychology and, therefore, seeks to explain how individuals' prior expectations about a specific phenomenon shape their perceptions and judgments of it (Hossain & Quaddus, 2012). The two predictors of the ECT are (1) a person's expectations and (2) the perceived performance of an object or phenomenon. Expectations refer to the attributes that a person anticipates will be associated with an object and perceived performance refers to a person's perceptions of the actual performance of an object. Both have a direct influence on a person's (dis)confirmation of beliefs — the evaluation that a person makes with respect to an object or phenomenon (Oliver, 1977, 1980). Given that a complex task is by its nature perceived more difficult to perform than a routinized task (where experience about the activity have already been gathered), a possible mistake in a complex task should be expected more strongly a priori compared to a mistake in a routine task. In other words, a mistake in a complex task confirms with the prior attitude towards the mistake whereas in a routine task it is expected that mistakes should be avoided and therefore the prior attitude disconfirms with the occurrence of a mistake. Given the ECT's theoretical presumptions, we assume that a mistake in a routine task is judged more negatively than a mistake in a complex task.

## Experiment 1

In our first experiment we tested whether mistakes are judged differently when knowing that it was either a routine or a complex task in which the mistake happened. In an online experiment with two between-subject conditions, we presented subjects two identical cases of mistakes at work. In the first condition we primed the two cases as a complex task whereas in the second condition we primed the cases as a routine task and measured the subjects' attitude towards the respective mistakes.

## METHOD

### *Participants and Design*

Eighty-eight alumni of a German university of applied science ( $n = 59$  female) who were between 20 and 57 years old ( $M = 28.02$ ,  $SD = 8.34$ ) and reported a work experience of at least two years ( $M = 8.92$ ,  $SD = 7.92$ ) participated in the study. Participants for the study were invited via E-Mail and logged into an online survey, which randomly assigned them to one of two conditions (routine task vs. complex task).

### *Procedure*

In both conditions, participants were informed that the study's goal was to find out more about how people deal with mistakes at work. Therefore, they will be presented two short cases and asked for their assessment of the respective case. Furthermore, it was mentioned that the main focus is on their spontaneous perception from the viewpoint of a responsible manager. The first case contained 64 words and dealt with a mistake in conducting a regularly management report. The second case contained 61 words and centered around a mistake of a physician performing a knee surgery (please see appendix for detailed case descriptions). The manipulation of either a routine or complex task was carried out by a prime at the beginning of each case. In the routine-task-condition it was mentioned: "Note that this is a routine task of the activity". Additionally, in the first sentence of the routine-cases it was highlighted that: "This is a repetitive task the employee performs regularly". In the complex-task-condition it was mentioned: "Note that this is a complex task of the activity". Additionally, in the first sentence of the complex-cases it was highlighted that: "This is a complex task that requires specific skills". The remaining content was identical in the routine and complex condition.

### *Measures*

As we could not find a suitable measure of attitudes towards mistakes, we created a new scale. We took two attitude dimensions regarding the nature of a mistake at work into account when creating the scale. First, we considered the personal perception of the mistake using three items (translated from German) "such mistakes upset you because they are unnecessary", "such mistakes should actually be avoided", and "you are frustrated by the mistake because it means more work for you". Second, we took the resource perception of the mistake into account — the extent to which one believes the mistake has a negative impact on an organization: "such mistakes waste resources", and "such mistakes result in more cost than benefit". All participants responded to those five items on a scale ranging from 1 (does not apply) to 7 (applies completely). We conducted a principal component analysis across these 5 items. The Kaiser criterion indicated that a one factor solution is appropriate and therefore, the items were summarized into a single scale ( $\alpha = 0.79$ ).

## RESULTS

Results of a one-way ANOVA showed that in both cases the mistake in the routine task was judged significantly more negative than the mistake in the complex task. In case one (mistake in a management report), the results indicated a significant main effect  $F(1, 86) = 4.47$ ,  $\eta^2 = .049$   $p < .05$ . A comparison test

between the routine task and complex task condition in case one revealed that the attitude towards the mistake was significantly more negative in the routine task condition ( $M = 4.80$ ,  $SD = 0.97$ ) compared to the mistake in the complex task condition ( $M = 4.29$ ,  $SD = 1.27$ ) ( $M_{diff} = 0.51$ ,  $SD = .98$ ,  $p < .05$ ). In case two (mistake in a knee surgery), the results also indicated a significant main effect  $F(1, 86) = 8.05$ ,  $\eta^2 = .085$ ,  $p < .01$ . A comparison test, again, between the routine task and complex task condition in case two showed that the attitude towards the mistake was significantly more negative in the routine task condition ( $M = 5.74$ ,  $SD = 0.91$ ) compared to the mistake in the complex task condition ( $M = 5.10$ ,  $SD = 1.19$ ) ( $M_{diff} = 0.64$ ,  $SD = 1.08$ ,  $p < .01$ ).

## Experiment 2

In our second experiment, instead of priming a routine or a complex task, we presented subjects four different cases where two of them centered around a routine activity at work and the other two described a more complex task. Here, we were interested if the participants merely from the task description of a routine vs. complex activity at work judge a respective mistake differently. The study was carried out as an online experiment with two between-subject conditions. In the first condition, we presented subjects two different cases of a routine work task and in the second condition, we presented two different cases of a complex work task. As in our first experiment, we measured the subjects' attitude towards the respective mistakes.

## METHOD

### *Participants and Design*

One-hundred-four alumni of a German university of applied science ( $n = 73$  female) who were between 19 and 52 years old ( $M = 26.36$ ,  $SD = 6.89$ ) and reported a work experience of at least two years ( $M = 6.33$ ,  $SD = 5.38$ ) participated in the study. Participants were invited via E-Mail and logged into the online survey, which randomly assigned them to one of two conditions (routine task vs. complex task).

### *Procedure*

The procedure of our second experiment was identical to experiment one, except the presented cases (please see appendix for detailed case descriptions). In the routine task condition, two cases were presented that are associated with a mistake in a routine work activity. The first case of the routine task condition contained 96 words and centered around conducting a regularly key figures report for the management of an organization. In the case, a main figure has mistakenly not been updated. The second case contained 90 words and was about conducting bookings in accounting where a mistake has been made during a regularly booking of a business transaction. In the complex task condition, two cases were presented that are associated with a mistake in a complex work activity. The first case of the complex task condition contained 147 words and was about a mistake in designing a new model to predict the demand of an innovative new product. The second case contained 124 words and describes a mistake during the development of a new IT system.



### Measures

Attitudes were assessed with the same five-item scale used in experiment 1.

## RESULTS

Descriptive statistics showed that mistakes in the routine task cases were judged more negatively compared to mistakes in the complex task cases. The attitudes towards the mistake in the first routine task (management report) ( $M = 4.30$ ,  $SD = 1.13$ ) and the second routine task (error booking in accounting) ( $M = 4.56$ ,  $SD = 1.45$ ) were both assessed more negative than the attitudes towards the mistakes in the first complex task (new demand model) ( $M = 4.11$ ,  $SD = 1.24$ ) and the second complex task (IT system) ( $M = 3.53$ ,  $SD = 1.48$ ). In order to analyze the main effects of the attitudes towards mistakes in the routine vs. complex task condition, we combined the evaluations of both routine task cases as well as the complex task cases. Results of a one-way ANOVA revealed a significant main effect. Mistakes in the routine task cases were judged significantly more negative than the mistake in the complex task cases  $F(1, 102) = 6.65$ ,  $\eta^2 = .061$ ,  $p < .01$ . A comparison between the combined two routine task cases and the combined two complex task cases showed that the attitude towards the mistake was significantly more negative in the routine task condition ( $M = 4.49$ ,  $SD = 1.28$ ) than in the complex task condition ( $M = 3.87$ ,  $SD = 1.17$ ) ( $M_{diff} = 0.62$ ,  $SD = 1.10$ ,  $p < .01$ ).

## Discussion

The result of our study give rise to a dilemma of mistakes at work. On one hand, our experiments demonstrate that mistakes are perceived more negative when they happen in a routine than in a complex task. These findings are in line with the expectation–confirmation theory, where a complex task is expected more difficult to perform than a routinized task and, therefore, a mistake in a complex task confirms with the prior attitude towards it. In contrast, a mistake in a routine task deviates from the prior attitude towards it, as it is expected to perform the routine activity accurate due to the inherent experience one already gathered (Oliver, 1977, 1980). Therefore, mistakes in routine tasks will most probably harm one’s career at work more than mistakes in complex tasks. On the other hand, the dilemma arises as mistakes are more likely to occur in routine tasks when individuals are on “autopilot”. According to dual process theories, individuals make decisions either very quickly by intuition using minimal cognitive resources (System 1), or more slowly utilizing cognitive resources and deliberately considering and weighing alternatives (System 2) (Kahneman, 2003, 2012). Routine tasks that are by definition foreseeable and of repetitive nature (such as bookings in accounting, delivering a weekly report, writing minutes, or performing a standard surgery) are prone to mistake making (Kahneman, 2012; Weinzimmer & Esken, 2017). In this vein, mistakes due to cognitive biases and heuristics are well documented in the scholarly literature (Gigerenzer & Gaissmaier, 2011; Saposnik et al., 2016; Weissenberger-Eibl & Hampel, 2021). Summarizing, the dilemma arises as mistakes are perceived more negative when they happen in a routine task and at the same time routine mistakes are more likely to happen as System 1 thinking is activated. How can mistakes in routine tasks be avoided in order to resolve the dilemma? Moulton et al. (2007) offer an intuitive and excellent intervention they call slowing down when you should. Individuals must coordinate a constant amount of environmental

information with limited cognitive capacity. Developing automatic cognitive processes that require less intentional capacity and, thereby, free up cognitive resources are per se desirable to efficiently perform work activities. At the same time, less attention to a task at hand can lead to mistakes been overlooked (Jones & Endsley, 1996; Simons, 2000). The intervention of slowing down when you should, therefore, refers to a “better” set of cognitive processing strategies relevant for respective work activities and tasks. Switching from autopilot to deliberate thinking allows to activate cognitive resources when they are needed and is vital to reduce work related flaws and mistakes (Moulton et al., 2007). Basically, recognizing a task as “routinized” and important, slowing down automatic thinking at certain stages of the activity facilitates attention, deliberate task screening and process monitoring. Therefore, carefully reviewing one’s own routine tasks at work and slowing down when you should during those tasks most likely reduce routine-mistakes and may resolve the mistakes dilemma.

## Limitations and Future Research

Several limitations are underlying the results presented in this study. First, participants in the study represent a sample with a different duration of professional experiences and are working in various industries. Therefore, it is not able to draw from the data if there may be a difference with regard to mistake-tolerance in specific industries or firms. That is, there might be industries such as consulting, or health care where mistakes at work are judged more rigorous in general than in other industries. This represents a starting point for future research to replicate our findings in specific industries to shed light on possible moderators such as mistake-tolerance or mistake-culture. Second, the presented cases represent possible real-world mistakes at work. However, participants were not personally involved in the illustrated situations which means they do not experience the consequences of the mistake for themselves, their team, or organization. Hence, future research could (artificially) create personal involvement for example by means of implementing a test scenario or sum-game and measure the attitudes towards mistakes in routine vs. complex conditions. Third, we measured the attitudes towards the respective mistakes immediately after the presented cases. For future research, the long-term effects of mistakes at work, especially with regard to different mistake types such as routine or complex mistakes are of vast interest. Do the attitudes towards different types of mistakes last over longer periods of time and what effect do these mistakes have on one’s professional career? Fourth, we only assessed the attitudes towards mistakes but did not design and test interventions to cope with these mistakes. From both perspectives, intra- and interpersonal, future research should focus on designing practical interventions to help mistakes-makers as well as involved persons (e.g. managers, or colleagues) to deal with the situation for the better and at least accept the inherent human nature.

## Conclusion

In two experiments we tested whether mistakes in a routine vs. a complex work task are perceived differently from individuals in a power position. Results revealed that in both experiments, attitudes towards a mistake in a routine task were significantly more negative than in complex tasks. These results gave rise to a dilemma of mistakes at work.

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