Looking Back versus Looking Ahead:
Framing of Time and Work at Different Stages of a Project

KARL HALVOR TEIGEN* and KNUT IVAR KAREVOLD
University of Oslo, Norway

ABSTRACT

Progress on a well-defined project can be described along a task dimension in terms of amount done, or as amount of work still to be completed. Time-limited projects can also be described on a temporal dimension in terms of time spent versus time left. Five experiments are reported showing that such frames have predictable implications for speakers as well as for listeners: Statements by a team leader about time spent and work left are perceived as suggestions to “hurry up,” whereas complementary statements about work done and time left indicate that the team can take it more easy. The first set of statements further implies that the team is behind schedule, whereas the last two statements suggest that the team is ahead of the plan. In line with this, speakers preferred work done and time left statements when they were ahead of schedule, but not when they were behind. “Hurry up” and “behind schedule” interpretations were also shown to be dependent upon stage, being more prominent in the final stages than during the initial stages of a project. Copyright © 2005 John Wiley & Sons, Ltd.

KEY WORDS framing; schedules; time; probability; uncertainty

Imagine four different teams receiving feedback about project progress by their respective team leaders, about midway in the project period.

Team leader A: “We have used half the time”
Team leader B: “We have half the time left”
Team leader C: “We have completed half the task”
Team leader D: “We have half the task left”

The first two teams have clearly used the same amount of time, and the second two have done identical amounts of work. Still, the messages may not be perceived as equivalent. They seem to have different conversational implicatures (Grice, 1975) by directing the listeners’ attention to different aspects of the project in progress. In this paper we will explore some of the inferences, team members can be supposed to draw. Will they assume that they are ahead of or behind the schedule? Are they asked to hurry up or can they take it easy?

* Correspondence to: Karl Halvor Teigen, Department of Psychology, University of Oslo, P.O.B. 1094 Blindern, N-0317 Oslo, Norway. E-mail: k.h.teigen@psykologi.uio.no

Copyright © 2005 John Wiley & Sons, Ltd.
The opening example demonstrates that task progress, like other amounts or magnitudes, can be expressed in more than one way. A cup can be half full or half empty, a salami sausage can be 90% fat free or contain 10% fat, and the same operation can have a 95% survival or a 5% mortality rate. Such expressions that are logically equivalent, but linguistically different, are commonly referred to as frames. When they also are perceived as psychologically different, we can talk about framing effects.

Framing effects were introduced in the decision making literature by Tversky and Kahneman (1981), who showed in the famous Asian disease problem that risk preferences for a prospect formulated in terms of “lives lost” differed from the same outcome framed in terms of “lives saved.” Subsequent investigators have shown framing effects in a number of other risky decisions (for a review, see Kühberger, 1998), as well as in more simple judgment tasks. For example, Levin and Gaeth (1988) showed that ground beef described as 25% lean was given higher quality ratings than when it was described as 75% fat. Sanford, Fay, Stewart and Moxey (2002) found that yoghurt containing 25% fat was considered unhealthy, whereas 75% fat free yoghurt was perceived to be a healthy product, by a majority of respondents. Such cases that involve different evaluations of the same object or event, dependent upon the description of a target attribute, have been labeled attribute framing (Levin, Schneider, & Gaeth, 1998).

In attribute framing, the same target attribute must have two opposite poles, either of which can be used to define the dimension. For instance, success rates can alternatively be described in terms of failure rates (if successes and failures exhaust the outcome space), Ebbinghaus’s curve of forgetting can alternatively be described as a memory curve, and treatment efficiency can be described in probabilities of cure or no cure. Verbal statements of probabilities and some other quantities can, in addition, be framed by selecting a positive or a negative verbal phrase, as when we speak of the possibility versus the uncertainty of a cure (Teigen & Brun, 1999), or the presence of a few people versus few people (Moxey & Sanford, 2000). Here, the explicit target event remains the same, whereas the verbal quantifiers point either upwards (affirming the cure, or the presence of people) or downwards (highlighting the lack of certainty, or people absent). Thus phrases can differ in directionality, in focus of attention, or in perspective, to use Moxey and Sanford’s (2000) term.

Attribute framing has been studied mainly in the area of evaluative judgments, where a clearly positive description is contrasted with a clearly negative one (as when the same gamble is described in terms of chances of success or chances of failure). The common finding in these valence framing studies is, perhaps unsurprisingly, that positive descriptions lead to more positive evaluations than do negative ones. Levin, Schneider and Gaeth (1998) have presented an overview of valence framing studies and discuss several related reasons for this effect to occur: valence-based encoding, cognitive search for confirming evidence, and priming effects leading to the accessibility of positive versus negative associations in memory. The framing effects take the form of valence-consistent shifts, or sometimes, when the evaluations imply a choice between two statements, value-consistent reversals. Reversals imply that a majority endorsement of the positive claim under a positive frame is changed into a majority endorsement of the negative claim under the negative frame (e.g., from a “healthy” to an “unhealthy” product).

In their recent analysis, McKenzie and Nelson (2003) add to our understanding of framing effects by introducing the perspective of the speaker who chooses the frame. When does a speaker describe the cup as half empty rather than half full? McKenzie and Nelson suggest that the half empty speaker starts from a reference point above the current level (the cup used to be full, or perhaps three-quarters full, but is now about to be emptied). With “half full” the reference point is located below the current level (the cup used to be empty, or only one-quarter full, but has now been filled up). In other words, negative frames are a result of upward comparisons, whereas positive frames imply downward comparisons. This information is “leaked” to the listeners through choice of terms, making their apparently biased interpretations more understandable, perhaps even more rational. When we are told about half empty cups, we correctly assume that they should have been fuller, and we may also have some reason to believe that we are watching a negative trend that could continue into the future (draining the cups completely). Thus the statements do not simply induce optimism or pessimism in listeners, they also imply reasons for optimism or pessimism, by a process of “information leakage.”
Attribute framing is not limited to explicitly valenced descriptions, like wins and losses, successes and failures, lives saved or lives lost, but can also take place on more neutral dimensions. For instance the reader of a 400-page book may observe that she has read 100 pages, or that she has still 300 pages to go. It is not immediately obvious which description is positive and which is negative. A bored reader could find some comfort in the first description, whereas a reader who is enjoying herself might find the second description more appealing.

More generally, looking back versus looking ahead are two complementary perspectives on task progress, familiar to all travelers, workers, students, writers, and project managers. How many miles have we traveled, and how distant are we from the goal? How many pages have I written, and how many pages have I still to write? In many such cases, the question of what is a positive and what is a negative frame is an empirical rather than an a priori issue, and the implications as well as the effects of such frames have yet to be explored.

Projects are often scheduled to imply not only a specified amount of work, but also to be completed within a specific time period. Progress can accordingly be monitored both with respect to a task dimension: how much work is done, and on a temporal dimension: how much time has been spent? Progress on both dimensions can alternatively be described by looking ahead: How much work is still to be done, and how much time still remains? This leaves us with two complementary temporal frames, as well as two complementary frames for task achievements.

The purpose of the present experiments is to explore the implications of such frames, both from the listeners’ and from the speakers’ perspectives. Under which circumstances will speakers use one frame rather than another? What are the speakers trying to convey to their listeners? And how will the listeners interpret these messages? Participants in Experiments 1–4 were asked to indicate what they thought that speakers, using different frames, were trying to tell about progress on a project. Which frames suggest a situation where the project is delayed, and should be speeded up, and which frames imply a more satisfactory state of progress? In Experiment 5, the participants were placed in the role of speakers, selecting statements that correspond to a situation where project work is either behind or ahead of schedule.

In contrast with most other frames, amounts of work and time are continuous variables that undergo a progressive series of changes throughout the project. Tasks cannot be characterized by a fixed amount of work done (unless they have been abandoned), and amount time spent, or time left, will change in a predictable fashion from beginning to end of the allotted time period. Thus we may ask about the implications of different frames at different point in time. For instance, information about time left may carry less positive implications towards the end of a project period, when time is almost up, than at an earlier stage, with lots of unused time. Conversely, allusions to amount of work left may be perceived as more negative at an early stage than later, when the task is close to completion. Heath, Larrick, and Wu (1999) have suggested that when goals are used as reference points, they “inherit” the Prospect Theory value function (Kahneman & Tversky, 1979). This implies among other things that performances distant from the goal are perceived as more negative, and less motivating, than performances closer to the goal. Implications of frames should accordingly be studied at different stages of the task. In the present experiments, we investigate the implications of temporal frames when 10%, 25%, 50%, 75%, and 90% of the time is spent (corresponding to 90%, 75%, 50%, 25%, and 10% time left), and of task frames when 10%, 25%, 50%, 75%, and 90% of the work is done (corresponding to 90%, 75%, 50%, 25%, and 10% remaining work).

EXPERIMENT 1

When we describe the progress of a task that is scheduled to be completed within a certain time, focus can be on how much time is used as well as how much time one still has to one’s disposal. According to McKenzie and Nelson’s (2003) interpretation of frames, choice of frame implies a departure from a lower reference point on the target dimension, so for instance the claim that X% of the time is spent suggests that more time
has expired than expected. The complementary claim that 100%-X% of the time is left should, in contrast, suggest that there is more time to one’s disposal than originally assumed. This indicates in the first case that time is short and has to be recovered by hurrying up, and in the second that there is ample time and one can afford to proceed more leisurely. However, these predictions may be moderated by the value of X. When the time is nearly up (X = 90) there is not much time to one’s disposal even under a time left frame (10% of the time left is not very comforting, but might still be better than a message saying that 90% of the time is up).

Progress can also be measured in terms of completed or remaining work. When focus is on how much work is done, actual achievements are, by the same logic, compared to lower reference values. Focus on remaining work should, instead, refer to lack of accomplishments, the reference point being a completed task or at least one that is closer to completion. This led us to predict that descriptions in terms of work left imply a call to hurry up, whereas descriptions of work done justify a less hurried schedule. Thus references to “time spent” and “remaining work” are similar in implying an increased time pressure, whereas statements involving amount of “time left” and “work done” are believed to indicate a more relaxed attitude.

These interpretations were tested in a sentence completion task. This method for demonstrating the perspective, or frame, implied by a verbal statement, has previously been applied to verbal quantifiers by Moxey and Sanford (1987) and to verbal probabilities by Teigen and Brun (1995). In the present study participants were asked to complete selected statements with either a request to hurry up or a permission to take it easy, according to what they considered more appropriate.

Method

Participants

Participants were 168 students attending a course in introductory psychology at the University of Oslo (about 75% women, median age 21 years). They were randomly allocated to three different conditions by receiving different variants of the same basic questionnaire.

Questionnaires

All questionnaires described four teams, A, B, C, and D, which were working on a task planned to be completed within a certain time.

The questionnaires presented four hypothetical statements, issued by the team leaders, which were to be completed with either (a) “…so now we have to hurry up a little,” or (b) “…so now we can take it more easy.” Participants were asked to select the phrase that they felt would be a natural continuation of each sentence.

For participants in Condition I, the statements were:

Team A: “We have spent half the time…”
Team B: “We have half the time left…”
Team C: “We are done with half of the task…”
Team D: “We have half the task left…”

Participants in Condition II received the same statements, but with 75% of the time spent (25% of the time left), or with 75% of the task done (25% of the task left).

In Condition III the corresponding figures were: 90% of the time spent (10% of the time left), or 90% of the task done (10% of the task left).

In all conditions, the order of statements was counterbalanced, creating four subgroups within each condition with approximately the same number of participants. Two subgroups received statements about time before statements about task (ABCD, BADC), the other two received the task statements first (CDAB, DCBA). There were no order effects, and answers from all subgroups were pooled.
Results

A team that has used 50% of the time has, by implication, 50% of the time left, and vice versa. But these two statements have different foci. A focus on time spent suggests time as a scarce resource that can be exhausted. A focus on time left indicates that unspent time is still available and can be used for several purposes (including a more relaxed pace). These interpretations are, however, not only a function of framing, but also of the amount of time used or left. Thus, with only 10% of the time left there will be less latitude for taking it easy and more reasons to hurry up, if work is still to be done. In line with this, Table 1 (upper half) shows that around 90% of all references to time spent implied a request for hurrying up, regardless of condition. References to time left yielded a much higher proportion of “take it easy”-responses, especially in Condition I, where the amount of time left was substantial. Chi-square tests revealed significant framing effects in all three conditions. In Condition I the different frames led to a preference reversal, \( \chi^2 (1, N = 58) = 43.3, p < 0.001 \), whereas the other two conditions display smaller, but significant preference shifts \( \chi^2 (1, N = 51) = 10.2, p < 0.001 \), and \( \chi^2 (1, N = 59) = 4.2, p < 0.05 \), for Conditions II and III, respectively.

When tasks were framed in terms of work done, the implication was in all conditions that the teams could take it “more easy.” Table 1 (lower half) shows that this interpretation was shared by more than 90% of all participants. In contrast, focus on work left yielded a preference reversal, with a majority of “hurry up” responses in Conditions I and II. With only 10% of work left (Condition III), opinions were more divided; less than half would hurry up, a few more would take it easy. Chi-square tests revealed strong evidence of framing effects for work done/work left in all three conditions; \( \chi^2 (1, N = 58) = 79.5, p < 0.001 \); \( \chi^2 (1, N = 51) = 43.0, p < 0.001 \); and \( \chi^2 (1, N = 59) = 22.2, p < 0.001 \), for Conditions I, II, and III, respectively.

A comparison of time and task frames (upper vs. lower half of Table 1) shows that in this experiment, there are stronger framing effects for tasks than for time. Moreover, time frames elicited more “hurry up” responses than task frames. Two interpretations are possible. Perhaps a focus on time tends to facilitate hurry up responses, or perhaps the effect is due to a selective emphasis on the later stages of a task (when 75% and 90% of the time is spent). This issue will be further discussed in Experiment 3.

EXPERIMENT 2

While Experiment 1 explored communicative implicatures of different time and task frames, Experiment 2 investigated possible reasons for a speaker to select these frames. When will a team leader choose to speak about work done rather than work left, thereby suggesting that the team could take it somewhat easier? When will a leader inform the team about time spent rather than time left, increasing the time pressure?

If frames are chosen as a function of reference values, as proposed by McKenzie and Nelson (2003), focus on work done should indicate that more work is actually done than expected, suggesting that the team is
actually ahead of schedule. Conversely, focus on work left could indicate less progress than expected, or in other words that the team is behind schedule. Time spent should compare actual time usage to a lower reference point on a dimension of time consumption, suggesting that the team is behind; whereas focus on time left could mean that the team is ahead of schedule (the reference point being less time left than is actually the case).

In line with the results of Experiment 1, we assume that framing effects (and reference points) are also influenced by the amount of time and work left. With little time left there is not much chance to be ahead of schedule, whereas little work left suggests a situation where the team is on schedule, or perhaps ahead of it, despite the focus on work left rather than on work done. Thus we would expect an interaction between frame and stage of work in participants’ evaluation of progress.

Method
Participants
Participants in this experiment were 154 psychology students drawn from the same population as in Experiment 1 (participants were randomly allocated either to Experiment 1 or to Experiment 2). They were divided in three conditions by receiving different versions of the same basic questionnaire.

Questionnaires
As in Experiment 1, all questionnaires described four teams, A, B, C, and D, working on a project that should be completed within a certain time. Participants were presented with statements made by the leaders of the respective teams, the task being to decide, based on these statements, whether the team in question is (a) ahead of schedule or (b) behind schedule.

The statements were identical to those spent in Experiment 1. For Condition I these were [Condition II and III in brackets]:

Team A: “We have spent half [75%; 90%] of the time”
Team B: “We have half [25%; 10%] of the time left”
Team C: “We have done half [75%; 90%] of the task”
Team D: “We have half [25%; 10%] of the task left”

In all conditions, order of statements was counterbalanced, creating four subgroups with approximately the same number of subjects. In the results, answers from these subgroups are pooled.

Participants in all conditions were finally asked to rank the four statements by placing the letters A-D on a visual analog scale according to how positive they were perceived to be (from the least positive to the most positive statement). They were also asked to rank the teams on a second scale according to how hard they thought the teams would work to complete the task (from the least hard-working to the most hard-working team). Teams were scored 1–4 according to their relative positions on these scales.

RESULTS

Statements referring to amount of time spent were in all conditions perceived to indicate that the team was actually trailing behind schedule (Table 2, upper half). References to time left produced a framing reversal in the 50% condition: When half the time is up, the team is behind, but when half the time is left, it is probably ahead of schedule; \( \chi^2 (1, N = 57) = 21.2, p < 0.001 \). When less time is left, as in Conditions II and III, most respondents guessed that the team is behind. There were, in these cases, much smaller framing effects (no
shift in Condition II, and a barely significant shift in Condition III, \( \chi^2 (1, N = 51) = 4.1, p < 0.05 \). Perhaps “25% [10%] time left” is read as “only 25% [10%] time left,” which would naturally lead to a behind schedule interpretation.

In contrast, specifications of amount of work done indicated in all conditions that the teams are ahead of schedule (Table 2, lower half). When these amounts are reframed as work left, participants in Condition I guessed that the team is behind. Thus we find again a reversal due to frame in the 50/50 condition, \( \chi^2 (1, N = 57) = 83.4, p < 0.001 \), and a minor shift in conditions II and III (only significant in the latter condition, \( \chi^2 (1, N = 51) = 8.9, p < 0.01 \)). With only 25% or 10% of the work left, the teams are probably ahead of schedule despite the choice of frame.

**Work done** was in all conditions considered to be a more positive formulation than work left, grand mean ranks 3.35 versus 2.53, \( t(150) = 6.89, p < 0.001 \) (paired comparison test). Similarly, **time left** statements were in all conditions perceived as more positive than time spent, grand mean ranks 2.33 versus 1.78, \( t(150) = 4.03, p < 0.001 \). The mean ranks, displayed in Figure 1, further show that references to amount of work were generally more positive than references to time.

The participants showed less agreement about which team would be motivated to work harder. Significant differences between mean ranks were only obtained in Condition III (the team closest to the goal), where

### Table 2. Preferences (percentages) for “behind schedule” and “ahead of schedule” interpretations of time and task frames, Experiment 2

<table>
<thead>
<tr>
<th></th>
<th>Condition I (n = 57)</th>
<th>Condition II (n = 47)</th>
<th>Condition III (n = 51)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time frames</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behind schedule</td>
<td>Half time spent</td>
<td>Half time left</td>
<td>75% spent</td>
</tr>
<tr>
<td></td>
<td>71.9</td>
<td>28.6</td>
<td>68.1</td>
</tr>
<tr>
<td>Ahead of schedule</td>
<td>28.1</td>
<td>71.4</td>
<td>31.9</td>
</tr>
<tr>
<td><strong>Task frames</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behind schedule</td>
<td>Half work done</td>
<td>Half work left</td>
<td>75% done</td>
</tr>
<tr>
<td></td>
<td>5.4</td>
<td>91.2</td>
<td>29.8</td>
</tr>
<tr>
<td>Ahead of schedule</td>
<td>94.6</td>
<td>8.8</td>
<td>70.2</td>
</tr>
</tbody>
</table>

![Figure 1. Mean positivity ratings of four time and task statements at five stages of a project (combined results from Experiment 2 and 3)](image-url)
time left was considered more motivating than time spent, and work left more motivating than work done. This is in line with the goal gradient predictions of Heath, Larrick and Wu (1999). Overall the least hard-working group was believed to be the team that was informed about how much work they had done (mean rank 2.22), thus the most positive statement was at the same time believed to be least motivating for hard work. Mean ranks for the individual conditions are summarized in Figure 2.

EXPERIMENT 3

All judgments studied in Experiments 1 and 2 focused on later stages of a task, after 50%, 75%, or 90% of the time is up, or when 50%, 75%, or 90% of the task is completed. The studies showed stronger framing effects for the 50/50 situation than for subsequent stages, along with other patterns of interaction between stage and type of judgment. This called for a supplementary study where the initial stages of a task are represented.

Method

Participants
Participants were 62 students taking a communication course at the BI Norwegian School of Management in Oslo (about 50% females, median age 22 years). They were randomly allocated to two conditions by receiving different variants of the same basic questionnaire.

Questionnaire
All participants received questionnaires where the first page contained the set of questions presented in Experiment 1 (sentence completion: Should the statement continue with a request to hurry up or take it more easy). The second page contained the set of questions presented in Experiment 2 (are the teams behind or ahead of schedule, along with ratings of positivity and motivation for hard work).
For participants in Condition I \((n = 33)\) the statements referred to 10% of the time spent (90% of the time left) and 10% of the work done (90% of the work left). For participants in Condition II \((n = 29)\) the corresponding percentages were 25% time spent and 25% of the work done (75% of the time left, or 75% of the work left).

Statements were presented in counterbalanced order, yielding four different subgroups per condition with 7–9 participants in each.

**Results**

The results show significant framing effects for time (Table 3, upper half), but only marginally for task (lower half of the table). Focus on 90% and 75% time left suggested that the team could take it easy, whereas focus on time spent produced a more inconsistent pattern of responses. When only 10% of the time is spent, a majority thinks there is no rush, but with 25% of the time spent they switch to the “hurry up” recommendation. When 90% or 75% of work is left there are clearly reasons to hurry up. Focus on the amount of work done is in these conditions not sufficient to take it easy, presumably too little work is done to relax. Still there is a tendency to produce more “take it easy” responses in the work done frames than in the work left frames.

Who are behind schedule and who are ahead of it? Participants in Condition II displayed strong effects both of time frames and of task frames. If a team has spent 25% of the time, it is behind schedule, with 75% of the time left, it is ahead (Table 4, upper right). Similarly, if 25% of the work is done, the team is ahead, if 75% is left, it is behind (Table 4 lower right). These patterns of responses come close to results from the 50/50 condition in Experiment 2 (Table 2). The teams judged in Condition I were different. They were typically ahead of schedule in both time frames, and behind schedule in both task frames (Table 4). The reasons are obvious. It is difficult to be much behind schedule when only 10% of the time has passed, and conversely, one can scarcely be much ahead of schedule when only 10% of the work has been done.

<table>
<thead>
<tr>
<th>Time frames</th>
<th>Condition I ((n = 29))</th>
<th>Condition II ((n = 33))</th>
</tr>
</thead>
<tbody>
<tr>
<td>10% spent</td>
<td>90% left</td>
<td>25% spent</td>
</tr>
<tr>
<td>Hurry up</td>
<td>41.4</td>
<td>6.9</td>
</tr>
<tr>
<td>Take it easy</td>
<td>58.6</td>
<td>93.1</td>
</tr>
<tr>
<td>Task frames</td>
<td>10% done</td>
<td>90% left</td>
</tr>
<tr>
<td>10% done</td>
<td>75.9</td>
<td>93.1</td>
</tr>
<tr>
<td>Hurry up</td>
<td>24.1</td>
<td>6.9</td>
</tr>
<tr>
<td>Take it easy</td>
<td></td>
<td>39.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Task frames</th>
<th>Condition I ((n = 29))</th>
<th>Condition II ((n = 33))</th>
</tr>
</thead>
<tbody>
<tr>
<td>10% done</td>
<td>90% left</td>
<td>25% done</td>
</tr>
<tr>
<td>Behind schedule</td>
<td>37.9</td>
<td>10.3</td>
</tr>
<tr>
<td>Ahead of schedule</td>
<td>62.1</td>
<td>89.7</td>
</tr>
<tr>
<td>Task frames</td>
<td>10% done</td>
<td>90% left</td>
</tr>
<tr>
<td>Behind schedule</td>
<td>69.0</td>
<td>93.1</td>
</tr>
<tr>
<td>Ahead of schedule</td>
<td>31.0</td>
<td>6.9</td>
</tr>
</tbody>
</table>

Table 3. Preferences (percentages) for “hurry up” and “take it easy” interpretations of time and task frames, Experiment 3

Table 4. Preferences (percentages) for “behind schedule” and “ahead of schedule” interpretations of time and task frames, Experiment 3
Positivity ratings confirm that time left statements are better than time spent statements, and that work done frames are more positive than corresponding work left frames. In contrast with Experiment 2, time frames are in this experiment generally better than task frames, as shown in Figure 1, where mean ranks from both experiments are displayed.

Positive statements are, however, not supposed to make the teams work hard. Figure 2 shows that time left statements are assumed to be least conducive to hard work, whereas work left statements will most likely initiate hard work. The figure further demonstrates that information about time left is believed to be more motivating at the later stages of a task (as shown by ratings from the previous experiment).

EXPERIMENT 4

This study was performed as a replication using participants with a higher level of expertise. Participants in the preceding studies were all students, for whom the teamwork examples may have been more hypothetical than real. In Experiment 4 similar questions were given to two groups of experienced project leaders and project members working on international technology projects.

Method

Participants

Participants in Group A were 20 engineers attending a team building session in their project. Group B consisted of 23 employees in a pharmaceutical company attending a strategy workshop.

Questionnaires

Group A. All participants were given the same questionnaires, both with (1) sentence completion questions, as in Experiment 1, and (2) questions about who are ahead of and who are behind schedule, as in Experiment 2. Only the 50/50 condition was used, where the teams are supposed to have spent half the time, or had half the time left, and so on. Due to international participation, an English version of the questionnaire was used.

Group B received a parallel set of questions, based on the 75/25% condition in Experiment 1 and 2. Two changes were introduced to make the situation as realistic as possible. (1) The introduction described a specific project, familiar to all the participants, which was actually about 75% completed. (2) The four different formulations (‘‘We have spent 75% of the time,’’ ‘‘We have 25% of the time left,’’ and so on) were supposedly expressed by four different individuals, but referring to the same project. The question was, as before, how to complete the sentences (Part 1), and to infer the speakers’ beliefs about being behind or ahead of schedule (Part 2).

Results

Results from Group A showed framing reversals for time and tasks both with sentence completion questions and in beliefs about being behind or ahead of schedule (Table 5). ‘‘Half of the time is spent’’ implies a request for hurrying up, along with an assumption that the team is behind schedule. ‘‘Half of the time is left’’ suggests (somewhat less strongly) that the team can take it more easy and is probably ahead of schedule. Both these framing effects are significant (Fischer exact test, $p < 0.01$). ‘‘Half of the work is left’’ suggests being behind schedule and a need to hurry up, whereas ‘‘half of the work is done’’ gives rise to the opposite interpretations. Both these framing effects are also significant (Fischer’s $p < 0.01$).
Group B showed smaller framing shifts, although in the predicted direction. This could be expected since all expressions referred to the same, familiar project. Part (1) showed a general predominance of “hurry up” interpretations, which may reflect a realistic perception of time pressure in a competitive environment. It will be recalled that the 75/25% conditions of Experiment 1 and 2 showed significant framing effects on sentence completion, but not on judgments of task progress. In the present experiment, the only significant frame reversal was obtained on task progress (Part 2), where the formulation “75% work is done” was believed to indicate ahead of schedule, whereas “25% work left” indicated behind schedule (Fisher exact test, \( p < 0.01 \)).

Both samples of respondents were too small to warrant a precise comparison between “expert” and “lay” judgments. However, it appears that the patterns of responses for the sample of engineers are very similar to the responses from psychology students in the 50/50 conditions of Experiment 1 and 2. Framing effects were also observed in the 75/25% group of pharmacists, despite the use of a familiar, concrete example. This group actually demonstrated larger framing effects than the students in the corresponding 75/25% conditions, indicating the relevance of time and task frames for a group of professionals.

### EXPERIMENT 5

McKenzie and Nelson (2003) have claimed that listeners can be justified in being influenced by the way a message is framed, because the frames suggest, or “leak,” important information. The information leakage hypothesis presupposes that speakers actually choose frames corresponding to the information they want to convey.

In the preceding studies, participants acted as listeners, who were asked to draw inferences from statements formulated by another speaker. In Experiment 5, participants are instead placed in the role of speakers, with knowledge about task progress, the question being how they will choose to impart this knowledge to a listener. If focus on the amount of work done suggests a situation where the work is surpassing one’s expectations, this frame would be chosen by speakers who know that the team is ahead of schedule. When the team is behind schedule, we would predict a stronger emphasis on the amount of work left. Being behind or ahead of schedule should also influence the speaker’s choice of time frames. We would expect more references to...
time spent for slow projects, while time left more appropriately characterizes a project that is ahead of the plans.

We have seen that people’s interpretations of frames are also related to stage of progress. For instance, “behind schedule” and “hurry up” — interpretations were more frequent at later stages, regardless of frame. This might also affect choice of frame. In the present experiment, we asked for speakers’ preferences at two stages, one rather early and one later in the project period.

One might also suspect that work done and time spent frames are generally chosen more often than their complements, simply because the progression of work and time is naturally unidirectional, running from 0 to 100%. A cup that is being filled is probably more often described as half full than half empty, even when it is filled slowly or “behind schedule.” Thus general preferences linked to typical developments and basic reference points may modify or even override the behind/ahead of schedule-manipulation.

**Method**

**Participants and design**
Participants were 76 students attending introductory lectures in psychology at the Universities of Oslo and Tromsø, Norway (73% women, median age 25 years). They were randomly assigned to four different groups in a 2 × 2 design, where one factor was Ahead versus Behind schedule, and the other was Early versus Late in the project.

**Questionnaire**
All participants were given a simple vignette asking them to imagine that they were working in a team with a task that was to be completed within a specific time. Participants in the Behind schedule conditions were told: “You realize that you are behind schedule and should hurry up,” whereas participants in the Ahead of schedule conditions were told: “You realize that you are in fact ahead of schedule and can take it more easy.” Participants in all groups were then asked how they would inform a colleague about the progress. The options were given as two pairs of statements, where they should select one statement in each pair.

Participants in the Early stage/Behind schedule condition received the following two pairs:

“As far as the task is concerned, (a) we have done 20% of the work, or (b) we have 80% of the work left.”

“As far as time is concerned, (a) we have spent 40% of the time, or (b) we have 60% of the time left.”

Participants in the corresponding Early stage/Ahead of schedule condition received the same options, except that 40% of the work was done (60% left), and they had spent 20% of the time (80% left).

In the Late stage conditions, Behind schedule participants were given the following pairs of answers:

“As far as the task is concerned, (a) we have done 60% of the work; or (b) we have 40% of the work left.”

As far as time is concerned, (a) we have spent 80% of the time; or (b) we 20% of the time left.”

Late stage/Ahead of schedule participants were given similar options, except that 80% of the work was done (20% left), and they had spent 60% of the time (40% left).

**Results**
Results from the four different groups are summarized in Figure 3. The figure shows the percentages of subjects in each group who chose the “work done” and “time spent” options (“work left” and “time left” choices can be derived from the complementary percentages).

The figure shows a strong overall framing effect for choice of work done versus work left statements, as 91.2% of the participants in the Ahead of schedule conditions prefer to speak of work done, against around 46.6% in the Behind schedule conditions, χ² (1, N = 76) = 16.15, p < 0.001. This difference is especially
prominent at an early stage, where all participants refer to work done when the project is ahead of schedule, whereas nearly 70% of those that are behind refer to amount of work left.

There is also a consistent difference in the choice of time frames. Participants in the Behind schedule conditions tend to prefer time spent statements, especially at an early stage, whereas participants in the Ahead of schedule conditions focus on time left. Overall choice percentages of “time spent” are 52.2% for behind schedule versus 29.4% for ahead of schedule participants, $\chi^2 (1, N = 76) = 4.07, p < 0.05$.

The results of this experiment are clearly in line with the previous studies, which showed how listeners’ reading of messages depended on how they were framed. The present experiment showed that speakers’ choices of frames are affected in a parallel fashion. Participants preferred work done and time left statements when they were asked to describe an ahead of schedule situation. Behind schedule situations were, in contrast, described both in terms of work done and work left, depending upon the stage of work, and with no strong preferences for time spent versus time left frames. It should be noted that the present study also differs from the preceding ones by using a between-subjects design for the ahead of schedule/behind schedule manipulation. For instance in Study 2 the same participants were asked to choose between an Ahead/Behind interpretation, whereas in the present study the Ahead/Behind manipulation is less transparent, by being given to different participants.

**GENERAL DISCUSSION**

Recent literature on organizational behavior and management highlights the importance of time as a “research lens” (Ancona, Goodman, Lawrence, & Tushman, 2001). Different conceptions of time will decisively contribute to the way work is organized, how projects are structured, and how fast they are carried out (Ancona, Okhuysen, & Perlow, 2001; Crossan, Cunha, Vera, & Cunha, 2005). The present analysis is based on two conceptions of time: a) time as linear (as opposed to cyclical), and b) clock time (as opposed to event time), where time can be divided into similar, objectively quantifiable units that can be measured (Ancona et al., 2001). Projects are examples of tasks where these attributes of time are salient. Many projects are
scheduled to imply not only a specified amount of work, but also a specific time period allotted to the completion of the task. They typically start at a specific point in time and have clear end dates. Projects are in many cases divided in phases or stages, with specified duration, tasks and resources—so that one can estimate when it is most useful to spend time to complete the task.

In the present studies we have assumed that the progress of a project can be described along two parallel, measurable dimensions: amount of time and amount of work. Both dimensions are further assumed to have clearly defined starting points and end points (deadlines and terminations), and to be coordinated by a work schedule. Tasks should be finished by the time ‘time is up’, and ideally be half completed when half of the time is used, and so forth. But the two dimensions differ in one important respect: While the pace of clock time is uniform and uncontrollable, the pace of work can be intensified or relaxed. The result is that work can lag behind or be ahead of schedule, and conversely, that perceptions of being behind can lead to intensified efforts, whereas perceptions of being ahead allow for taking a break or continuing at an easier pace.

We have further assumed that the progress of such projects can be described on the temporal dimension in two complementary ways, namely in terms of time spent or in terms of time left. These two, logically equivalent ways were shown to create substantial framing effects. Statements indicating how much time is spent were generally interpreted as requests to hurry up, whereas statements about how much time is left were more often believed to indicate that the team could take it easier. The relative frequencies of these interpretations change over time: At an early stage (when only 10% or 25% of the time is used), “take it easy” interpretations are dominating, closer to deadline (when 75% or 90% of the time is up), “hurry up” interpretations are becoming more prevalent. For an overview, see Figure 4 where results from Experiment 1 and 3 are pooled. The figure shows that framing effects prevail throughout: The graph for time spent lies consistently above the graph for time left.

Statements indicating how much of the work is left are, similarly, consistently interpreted as requests to hurry up, whereas statements about how much work is done carry the opposite message. Again, the relative frequencies of these interpretations vary with amount of progress; When little is done one should hurry up, when little is left one can take it easier; yet work left statements lead to higher percentages of hurry up responses than work done statements throughout the project (see Figure 4).

Figure 4. Percentages of “hurry up” responses to four time and task frames at five different stages of a project (combined results from Experiment 1 and 3)
Framing effects on “hurry up”/“take it easy” responses can be given at least two interpretations. From a linguistic point of view it may be claimed that statements about time spent (or work left) simply indicate a comparison or contrast between an explicit quantity and an implied, lower reference point. Thus “half the time is spent” implies that the speaker feels more time has been used than expected or desired. It is thus natural for this speaker to complete the sentence with a request to hurry up, rather than to take it easy.

Such statements can, however, express more than the speaker’s personal expectations and desires. “Half the time is spent” may accurately reflect the fact that the task is at the moment behind schedule. In other words, there may be more than half the work waiting to be completed. In contrast, “half the time is left” may imply that the situation is under control and that the task is at least half complete. These interpretations are supported by the results of Experiment 2 (and the second part of Experiment 3), where participants were asked to guess which teams were behind and ahead of schedule, resulting in similar framing effects as in the sentence completion task. The results from both experiments are summarized in Figure 5.

The present results do not allow us to distinguish between these two interpretations. The framing effects demonstrated in Experiment 1 (and in the first part of Experiment 3) could reflect the speakers’ general views on satisfactory versus unsatisfactory progress, or be due to more specific observations about progress relative to schedule. The first interpretation could be tested in a study where the teams had objectively accomplished the same amount of work (within the same time frame), but where the team-leaders chose different formulations. In the present studies, the two time frames and the two work frames are not directly comparable, as we do not know whether the teams with half the time spent have actually done half the work, and vice versa. Experiment 3 allows for a more direct comparison between “hurry up” and “behind schedule” interpretations, as in this experiment the same individuals responded to both questions. It turned out that respondents who believed that the team was behind schedule gave more hurry-up responses than those who believed it was ahead.

Our rather schematic designs do not reflect the pattern of progress typical for many real projects, where the least amount of work is done in the initiation and completion phases, and most work is distributed in construction and installation phases in the middle stages of the project. Most real projects also have temporal and

![Figure 5](https://example.com/figure5.png)

**Figure 5.** Percentages of “behind schedule” responses to four time and task frames at five different stages of a project (combined results from Experiment 2 and 3)
task related milestones, functioning as additional reference points. Such features should be incorporated in future framing studies.

To our knowledge, this is the first study where time and work frames have been explicitly compared. This is surprising, given the persisting interest and wide reaching implications attached to the concept of framing (Frisch, 1993; Kahneman & Tversky, 1979; Soman, 2004; Rothman & Salovey, 1997), along with the common observation of perspective shifts on time as well as on tasks. With respect to time, psychologists have distinguished between a backward looking and a future oriented time perspective (Zimbardo & Boyd, 1999). Similarly, work can be measured and evaluated both in terms of accomplishments and in terms of distance from a goal. Such reference points are recognised as having implications for work dynamics as well as for work satisfaction. Heath, Larrick, and Wu (1999) argue that goals lead to upward comparisons and hence negative evaluations of whatever has been accomplished, but induce at the same time motivation for further work. In a clever set of experiments, Josephs, Giesler, and Silvera (1994) showed that manipulations leading to more visible output (greater pile of accomplished work) made participants happier with their performance, but at the same time less persistent. So for instance students who had to type an assignment on a PC with large fonts were more satisfied with their work (more voluminous output), but wrote shorter essays than students who wrote their assignments with small fonts. This study focussed on the effects of work done. In a later study, the same authors found that amount of work left had an effect on their beliefs in mastery over a task (Silvera, Josephs, & Giesler, 2001).

The present studies were, in contrast, not designed to study the effects of work done/work left on work satisfaction, task mastery or work motivation, but to compare the messages conveyed by these frames. The results are supportive of McKenzie and Nelson’s (2003) information leakage hypothesis, which says that logically equivalent frames may imply different reference values and can thus be used to convey different messages. In our study, speakers who knew that the team was ahead of schedule selected a positive frame (as shown in Experiment 5); and conversely, listeners who were told about progress in a positive frame inferred that the team was ahead of schedule (as shown in Experiment 4) and felt less urged to hurry up. These choices and inferences are in agreement with McKenzie and Nelson’s claim that focus on the positive pole of a dimension (e.g., work done) implies a downward comparison, whereas focus on the negative pole (e.g., work left) reflects an upward comparison. Under these circumstances, and in contrast with the “received view” of framing effects as violating the invariance principle of rational choice, there is nothing unreasonable or irrational in responding differently to different frames. If “work left” phrases are used to indicate that the team is actually behind schedule, it is more adequate to increase one’s efforts than to relax.

Upward and downward comparisons apply not only to valenced dimensions (where the positive poles are good in an evaluative sense), but also to dimensions where the poles are positive or negative in a purely informative sense (indicating the presence rather than the absence of an attribute). For instance, time spent is positive in an informative rather than in an evaluative sense; such statements ask us to consider how much (rather than how little) time has elapsed. As most projects have a starting point, and a positive, continuous development, both with respect to time and work, progress is most naturally described in terms of time spent and work done, at least in the initial stages. A cup that is about to be filled is more naturally described as half full than half empty (McKenzie & Nelson, 2003); by the same token, one would expect that projects that start from scratch and develop in a cumulative way, would normally lend themselves to be described in terms of work done than in terms of work left. The same argument applies to the temporal dimension, which also unfolds progressively, and should be described accordingly, in terms of time spent. A switch to the opposite frame (to time and work left) requires a strong goal orientation, which may be more typical for the later stages of a project. Experiment 5, where participants acted as speakers, confirmed that work done is a more common frame than work left, which only occurred in the behind schedule conditions. But time left was generally chosen more often than time spent. Perhaps the amount of time spent is normally so obvious that it is not considered to be an important piece of information. Conversely, amount of time left does not inevitably indicate ample time, but can also impart a sense of urgency. “We have 20% of the time left” can easily
be construed as “we have only (or not more than) 20% of the time left,” changing the positive frame into a negative one. Such interpretations may account for some of the irregularities in the patterns of responses; however, these explanations are post-hoc and remain speculative until tested by more appropriate observations.

Previous research on factors influencing time and progress in projects has mainly focused on group and organization factors (for a review, see Kessler and Chakrabarti, 1996). We have not identified any studies of how individual factors such as cognitions, beliefs, or assumptions influence perceptions of project speed, i.e., whether projects move ahead slowly or quickly. In the present experiments, we demonstrate that the project leader’s way of expressing time and progress may influence the group’s perceptions about whether they need to accelerate work or can take it easy.

Many organizational tasks are defined by amount of work to be done and time available. Given that the framing effects observed in this study can be transferred to an organizational setting, managers should in general focus on time already spent and work remaining to be done if they want to communicate that work needs to be done fast. If, in contrast, staff members’ attention is on how much time that is left and how much work that already is done, conflicting frames could become a source of interpersonal tension.

The present research can have implications for other real-life situations, especially behaviors or tasks where amount of progress and time spent can influence people’s evaluations of their past efforts and their motivations for future investment of time and effort. One example may be repayment of debts, another adherence to a weight reduction program with a defined time goal and weight target. Future research could explore whether people who receive feedback about the amount still to be paid (or the years of past repayments) will feel a need to accelerate their part payments, and conversely, whether information about the amount already paid is associated with feelings of relief and satisfaction. In the case of weight reduction, we may ask how a reminder about time spent or time ahead, or information about pounds lost/still to be lost will influence the dieters’ motivation.

Progress on a project may be measured not only with respect to time and work, but also relative to the financial resources. How much money is spent, and how much is left? These two frames can be expected to convey messages similar to what we found with time frames. When 75% (or 90%) of the budget is spent, one should be more careful with further expenditures, whereas the announcement: “25% (or 10%) of the budget is left,” could encourage spending. Framing of money may in fact be even more common than time framing, as money can more easily be regarded as a usable, but limited resource (Soman, 2001). Time frames, as studied in the present paper, are indeed only plausible on a linear, limited time scale where the metaphor “time is money” can be applied (Lakoff & Johnson, 1980).

ACKNOWLEDGEMENT

We are indebted to Craig McKenzie for his valuable suggestions to an earlier draft of this paper.

REFERENCES


Authors’ biographies:

Karl Halvor Teigen is professor in general psychology at the University of Oslo, and adjunct professor at the University of Tromsø. His interests include subjective probability judgments, social cognition, and the history of psychology.

Knut Ivar Karevold is an independent organizational psychologist, with a particular focus on team- and organization-development in projects. His interests include project pace, time, judgments, and cognition.

Authors’ addresses:

Karl Halvor Teigen, Department of Psychology, University of Oslo, N-0317 Oslo, Norway.

Knut Ivar Karevold, Ullevålsallé 24, N-0852 Oslo, Norway.