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Exploring the "Planning Fallacy": Why People Underestimate Their Task Completion Times

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The Psychology of Emotional, Behavioral, and Motivational Self-Regulation

Planning Fallacy?

Ex.1

Sydney Opera House

Construction Completion

Planned: 1964 (for $7 million)
Actual: 1973 (for $102 million)

Ex.2

Daily Activity: Study

Planned: Do every assignment due next week
Actual: Do one assignment due tomorrow

Olin Library

Planning Fallacy (Kahneman & Tversky, 1979)

"The tendency to hold a **confident belief** that **one's own project will proceed as planned**, even while knowing that **the vast majority of similar projects have run late**."

(Buehler et al., 1994)

Economic, Social, and Personal Costs!

Authors

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Main Hypotheses

Task Completion Time

1. Underestimate their owns but not others
2. Focus on future plans rather than past experiences
3. Attributions (external, transient, and specific)

Terms (Kahneman & Tversky, 1979)

When we predict task completion...

Singular vs. Distributional

Singular : “aspects of the specific task” (e.g. difficulty, importance), case-based, **unique**

Distributional : “either personal experiences or others’ experiences (base rates)”, **similar**

Obstacles to using distributional info.

1. **Forward prediction**
2. **‘Similar’ might be too vague**
3. **Attributional processes**

Study I

Goal : to show optimistic estimates on task completion time

Design

37 Psychology Students
(27 females)

Best prediction
"Predict the submission date as accurately as possible"

Optimistic prediction
"If everything went well…"

"Pessimistic prediction"
"If everything went poorly…"

Study I Results

Table 1
Predicted and Actual Completion Times by Prediction Instruction: Study 1

Measure	Prediction instruction		
	Best	Optimistic	Pessimistic
Predicted days	33.9	27.4	48.6
Actual days	55.5	55.5	55.5
Difference	−21.6	−28.1	−6.9
Absolute difference	22.6	28.2	23.2
Subjects completed in predicted time (%)	29.7	10.8	48.7
R: Predicted and actual days	.77	.73	.72

Note. Means are based on 33 subjects.

- For ***best estimates,*** students significantly made ***optimistic*** predictions, on average.
- For ***pessimistic estimates,*** students made ***less optimistic*** but ***not more accurate*** predictions, on average.
- Even though biased, these predictions are ***still informative***

Study 2

Goal : to test **alternative interpretations** of the optimistic bias

1. *Task without external deadlines*
2. *Self-presentation bias*
3. *"Hope" estimates rather than best*

➜

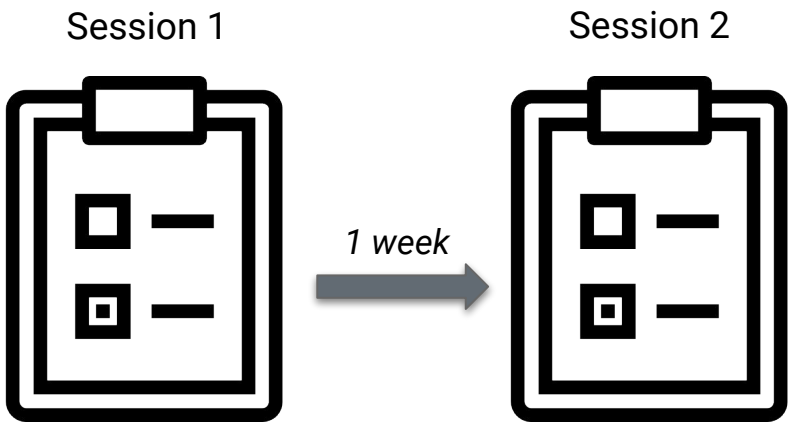
Two tasks with external deadlines

Complete or partial information

Confidence on their predictions

Design

104 undergraduates (54 males)



Study 2 Results

Task Type on Prediction

Table 2
Predicted and Actual Completion Times by Type of Task: Study 2

Measure	Task: Academic	Task: Nonacademic
Predicted days	5.8	5.0
Actual days	10.7	9.2
Difference	−4.9	−4.2
Absolute difference	5.6	5.8
Subjects completed in predicted time (%)	37.1	42.5
R: Predicted and actual days	.36	.48

Note. Means are based on the 91 academic projects and 62 nonacademic projects that were finished before the follow-up interview.

- No difference between tasks
- No moderation effect of information
- Predictions are still informative

Confidence

	Academic	Nonacademic
Mean	74.1%	69.9%
Completion	.29 ($p<0.01$)	.23 ($p<0.06$)

Deadlines

*"Most of the subjects finished before deadlines but **underestimated the importance of deadlines during prediction.**"*

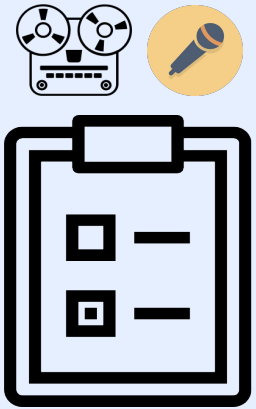
Correlation (r)	Prediction	Actual
Deadline	.23 ($p<0.09$)	.82 ($p<0.001$)

Study 3

Goal : to explore the **cognitive processes** by using **a 'think-aloud' procedure**

Design

78 undergraduates (44 females)



1. Project (in the next 2 weeks)
2. Deadline
3. Prediction
4. Certainty

(Counterbalanced)

- Recall their own failures
- Recall other's failure

Hypotheses

- ***Underestimation*** *of completion times*
- *Focus on* ***future scenarios***
- *Attribution of their prior failures to* ***external, transitory, and specific causes***

Study 3 Results

Replication of Study 1 & 2

	Optimistic Bias	Prediction & Actual Corr.	Confidence
Stats	2.68 ($p<0.01$)	0.81 ($p<0.001$)	83.5%

Difference from Study 2

Correlation (r)	**Prediction**	Actual
Deadline	**.87 ($p<0.001$)**	.91 ($p<0.001$)

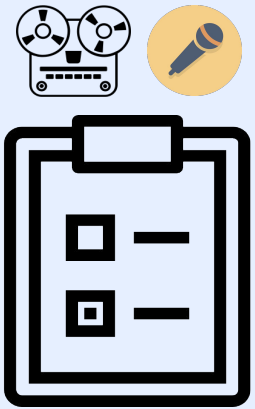
Verbal Protocols

*Proportion of responses assigned to each category

Category	**Proportion*
Future plans	**0.71**
Future problems	0.03
Past success	0.06
Past problems	0.01
Others' experiences	0.01
Disposition	0.02
Deadline	**0.15**

Study 3 Results

Attributions



1. Project (in the next 2 weeks)
2. Deadline
3. Prediction
4. Certainty

(Counterbalanced)

- **Recall their own failures**
- **Recall other's failure**

Q. Causes of those failures are …

External? / Transitory? / Specific?

0 (not external at all) - 7 (extremely external)

	Prior Prediction Failures		
Attributions	**Themselves**	**Others**	Stats
External	**3.40**	**2.92**	t-stat=1.84 (p<0.07)
Transitory	**4.71**	**3.81**	4.07 (p<0.001)
Specific	**4.22**	**3.61**	2.67 (p<0.01)

"Compared to others' prediction failures, subjects viewed their own prediction failures as ***more external, transitory, and specific.****"*

Study 4

Goal : to vary the **focus of thoughts** during prediction formulation and manipulate **deadlines**

Design

123 undergraduates (77 females)

Session 1

- *Prediction*
- *Write relevant thoughts*
- ***Past experiences***

1 week → **Session 2**

2 weeks → **Session 2**

Task: New Computer Tutorial Assignment

3 Conditions

1. **Control:** After prediction
2. **Recall & Recall-relevant:** Before prediction

→

- Recall: just recall
- Recall-relevant: connect past and current tasks

Study 4 Results

Prediction vs. Actual

Table 4
Predicted and Actual Completion Times by Thought Focus Condition: Study 4

Measure	Thought focus		
	Control	Recall	Relevant
Predicted days	5.5	5.3	7.0
Actual days	6.8	6.3	7.0
Difference	−1.3	−1.0	−0.1
Absolute difference	1.8	2.0	1.9
Subjects completed in predicted time (%)	29.3	38.1	60.0
Subjects refer to past experience (%)	2.4	11.9	12.5
R: Predicted and actual days	.60	.62	.75

- Main effect of **thought focus** on prediction
  - Relevant: predicted to finish later
- **No interaction with deadline**
  - **Only main effect:** 2-w predicted to finish later than 1-w

Accuracy

- **No main effect of thought focus** on accuracy
  - Less optimistically biased, but still not accurate in Relevant
- **Main effect of deadline**
  - More errors in 2-w than 1-w

Attributions

Attributions	**Late**	**On time**	Stats
External	3.5	3.2	1.84 (ns)
Transitory	**4.5**	**3.0**	30.7 ($p<0.001$)
Specific	**4.2**	**3.1**	9.73 ($p<0.01$)

Study 4 Results

Written Protocols

*Percentage of subjects who referred to each of the seven types

Category	**Percentage (%)*
Future plans	**93.5**
Future problems	9.8
Past experiences	**8.9**
Others' experiences	0.0
Disposition	4.9
Deadline	4.1

→

	Recall-relevant
Past experiences	**12.5%**

Of 12 who mentioned **past experiences,**
11 were from either **recall or recall-relevant** conditions

Mediating Process

***"No significant correlation** between **past times and predicted time** in all conditions"*

Study 5

Goal : to examine **actor-observer difference** and **the impact of different information**

Design

123 undergraduates (36 males)

Prediction

Participant A from Study 4 (in Control)

A's Thoughts

A's Memories

Combined

Study 5 Results

Self vs. Social

- Main effect of **deadline and status**
  - Observers made more conservative predictions

- **Interaction effect of deadline and status**
  - Observers were more sensitive to deadline

Informational bases

Thoughts vs. Others 8.0 vs. (8.8 & 8.7)

Thoughts vs. Memories 8.0 vs. 8.8 ($p < .10$)

Table 5
Predictions, Completion Times, and Thought Listing by Information Condition: Study 5

Measure	Actors	Observer information: Thoughts	Observer information: Memories	Observer information: Combined
Predicted days	5.5	8.0	8.8	8.7
Actual days	6.8	6.8	6.8	6.8
Difference	−1.3	1.2	2.0	1.9
Absolute difference	1.8	2.8	2.7	2.6
Subjects completed in predicted time (%)	29.3	65.9	68.3	70.7
R: Predicted and actual days	.60	.51	.64	.59
Subjects using information category in thought listing (%)				
Future plans	92.7	36.6	17.1	34.1
Future problems	9.8	58.5	34.1	36.6
Past success	2.4	2.4	36.6	36.6
Past problems	0.0	2.4	39.0	36.6
Others' experience	0.0	14.6	9.8	7.3
Disposition	0.0	26.8	24.4	22.2
Deadline	0.0	9.8	7.3	12.2

Note. $n = 41$ in each condition.

Study 5 Results

Thought Listing

Table 5
Predictions, Completion Times, and Thought Listing by Information Condition: Study 5

Measure	Actors	Observer information		
		Thoughts	Memories	Combined
Predicted days	5.5	8.0	8.8	8.7
Actual days	6.8	6.8	6.8	6.8
Difference	−1.3	1.2	2.0	1.9
Absolute difference	1.8	2.8	2.7	2.6
Subjects completed in predicted time (%)	29.3	65.9	68.3	70.7
R: Predicted and actual days	.60	.51	.64	.59
Subjects using information category in thought listing (%)				
Future plans	92.7	36.6	17.1	34.1
Future problems	9.8	58.5	34.1	36.6
Past success	2.4	2.4	36.6	36.6
Past problems	0.0	2.4	39.0	36.6
Others' experience	0.0	14.6	9.8	7.3
Disposition	0.0	26.8	24.4	22.2
Deadline	0.0	9.8	7.3	12.2

Note. $n = 41$ in each condition.

- Observers used more **distributional information** than actors when predicting.
- More observers in **the memories or combined conditions** mentioned **past experiences more** than in the thoughts condition.
- Observers focused **both plans and problems.**

Discussion

- Participants underestimated their completion times (**optimistic bias**).
- Subjects interpreted the causes of past failures as **external, transitory, and specific**, which diminished the relevance of the past failures to a current task.
- The optimistic bias could be reduced when directly connecting past predictions to current ones.
- Manipulations that reduced the optimistic bias (e.g. pessimistic prediction or recall-relevant) were ineffective in increasing accuracy.
- Observers tended to be more sensitive to base rates than actors themselves.

Limitations & Discussion Points

Limitations

- Some mismatches in the experiment procedures (e.g. differences in the order of recalling, reporting deadlines and making predictions) might hamper direct comparisons among studies.
- The role of motivation in the prediction process was not investigated.
- Verbal or written protocols (‘think-aloud’) might not be enough to reveal automatic and spontaneous cognitive processes during prediction.

Discussion Points

- *Implications of these findings on our understanding of habit formation?*
- *If the content of information (e.g. past experiences) did not differ in people who successfully predicted, then which factors could be attributed to their successes?*

Literature

Buehler, R., Griffin, D., & Ross, M. (1994). Exploring the “planning fallacy”: Why people underestimate their task completion times. Journal of Personality and Social Psychology, 67, 366-381.

Kahneman, D., & Tversky, A. (1979). Intuitive prediction: Biases and corrective procedures. *TIMS Studies in Management Science, 12,* 313-327.

Thank you for listening!