A WEEK TO REMEMBER
THE IMPACT OF BROWSER WARNING STORAGE POLICIES

JOEL WEINBERGER & ADRIENNE PORTER FELT
When someone clicks through an HTTPS warning, **how long** should the browser store that decision for?
WHY DO WE CARE?
REAL ATTACK: forget the decision as soon as possible

FALSE ALARM: save the decision as long as possible
REAL ATTACK:
forget the decision as soon as possible

FALSE ALARM:
save the decision as long as possible
REAL ATTACK: forget the decision as soon as possible

FALSE ALARM: save the decision as long as possible
WHICH STORAGE POLICY SHOULD CHROME USE?
NO CLEAR CONSENSUS

<table>
<thead>
<tr>
<th>Browser</th>
<th>OS</th>
<th>Session Type</th>
<th>Browser</th>
<th>OS</th>
<th>Session Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chrome 44</td>
<td>Windows</td>
<td>Browser session</td>
<td>Firefox 44</td>
<td>Windows</td>
<td>Permanent (or session)</td>
</tr>
<tr>
<td>Safari 9</td>
<td>Mac</td>
<td>Browser session</td>
<td>Safari 9</td>
<td>iOS</td>
<td>Permanent</td>
</tr>
<tr>
<td>UC Browser 10</td>
<td>Android</td>
<td>Browser session</td>
<td>UC Browser 2</td>
<td>iOS</td>
<td>Permanent</td>
</tr>
<tr>
<td>Edge 20</td>
<td>Windows</td>
<td>Browser session</td>
<td>UC Mini 10</td>
<td>Android</td>
<td>Never</td>
</tr>
</tbody>
</table>
a good policy should reduce the cost of a mistake & number of false alarms
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HOW DO PEOPLE REACT TO DIFFERENT STORAGE POLICIES?
6 EXPERIMENTAL GROUPS

<table>
<thead>
<tr>
<th></th>
<th>Session</th>
<th>1 day</th>
<th>3 days</th>
<th>1 week</th>
<th>1 month</th>
<th>3 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0%</td>
<td></td>
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</table>
ADHERENCE RATE
Rate at which people heed the warning's advice
EFFECT ON ADHERENCE
REGRET RATE
Rate at which people change their minds about a warning
EFFECT ON REGRET

Graph showing the effect on regret over different time periods: Session, 1 day, 3 days, 1 week, 1 month, and 3 months. The regret rate is plotted on the y-axis, ranging from 0% to 100%. The graph indicates a gradual increase in regret rate over time.
CORRELATED RATES

![Graph showing adherence and regret rates over time]

- **Adherence rate**
- **Regret rate**
## Choosing a Rate

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<th>1 month</th>
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<tr>
<td>Adherence</td>
<td>56.35%</td>
<td>63.96%</td>
<td>66.82%</td>
<td>69.88%</td>
<td>74.38%</td>
<td>75.28%</td>
</tr>
<tr>
<td>Regret</td>
<td>15.98%</td>
<td>15.67%</td>
<td>17.35%</td>
<td>20.59%</td>
<td>25.56%</td>
<td>25.86%</td>
</tr>
<tr>
<td>Δ Regret</td>
<td>-</td>
<td>-0.31</td>
<td>1.37</td>
<td>4.61</td>
<td>9.58</td>
<td>9.88</td>
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</table>
## CHOOSING A RATE

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the one-week policy is working well in practice
ALSO CLEAR DECISION IF:

1. User asks to forget
2. User clears browsing history
3. Client sees a valid chain
4 LESSONS LEARNED
1. Storage policies have a large effect on adherence
EFFECT IN CONTEXT
EFFECT IN CONTEXT
EFFECT IN CONTEXT
EFFECT IN CONTEXT
2. Storage policies account for difference between Chrome & Firefox
CHROME & FIREFOX
CHROME & FIREFOX
CHROME & FIREFOX

[Bar chart showing comparison between Chrome: old UI, Firefox, Firefox in Chrome, Chrome: new UI, Chrome: 1 week, and Chrome: 3 months]
3. Storage policies are confusing
4. Researchers & browsers should **study** storage policies
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