What does ‘truth’ feel like?

The phenomenology of truth:

The Aha! experience predicts accurate decisions in contexts of uncertainty or where problem solving or retrieval processes are hidden from awareness.

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Background

Many of our decisions are driven by hunches or intuitions, rather than deliberate, analytic, and conscious thought. Here we consider the possibility that the Aha! moment is akin to an intuitional about the ‘truthness’ of an idea or solution. When a solution to a problem or an idea pops into our minds unexpectedly, we often do not know ‘why we know’ that the idea is correct, and much of complex problem-solving may be hidden from awareness. This is exemplified in cases where a solution appears in mind while engaged in an unrelated task. It’s possible that the Aha! phenomenology occurs as a kind of cue to signal that an idea is likely to be true given what a person currently knows and believes. Extending on the work of Metcalfe & Wiebe (1986), Salvi et al., (2016), Webb et al., (2016), and Danek et al., (2017), across a range of tasks we evaluate when and under what conditions the sudden insight experience helps individuals make accurate decisions without any conscious verification, and propose a mechanism for why the phenomenology of insight predicts objective performance. We also aim to validate a novel objective measure of the insight experience using a hand held dynamometer, and demonstrate that real-time Aha! experiences, as well as their intensity, predict confidence and accuracy without any conscious deliberation.

The Eureka Heuristic: A model of how Aha! moments may guide judgments of truth by signalling consistency with implicit knowledge structures.

In two experiments using three different problem solving domains and three different sensory identification tasks we consistently find that—where implicit processing is involved—the Aha! experience is highly predictive of accurate decisions. We propose that humans use the Aha! phenomenology as a heuristic shortcut for truth in moments of uncertainty or wherever problem solving and retrieval processes are hidden from awareness. The feeling of insight may be a highly adaptive intuition about the veracity of an idea or solution to aid quick decisions under pressure. To measure the ineffable moment of insight, the hand held dynamometer is a promising alternative to self-report measures and feelings-of-warmth. The precise mechanism behind the insight-accuracy relationship remains an open question, but we consider the possibility that the Aha! experience signals consistency or coherence with ones existing knowledge and experience.

References:

Experiment 1

In the preregistered experiment we present 60 participants with 3 classic problem solving tasks: 10 insight problems, 10 analytic problems, and 10 compound remote associates task. After solution, we ask each participant whether they experienced an Aha! moment (yes / no) and if yes, we also ask them how intense it was on a continuous scale. They also provide a rating of confidence and familiarity (counterbalanced). Throughout problem solving participants indicate their perceived progress on the problem using a Vernier Hand Dynamometer which is a highly sensitive measure of grip strength. If an Aha! moment occurs, they are instructed to make a full strength squeeze which indicates the sudden onset of an insight solution.

The Vernier Hand Held Dynamometer: A novel, objective measure of insight moments.

Results:
- Both self-reports and the dynamometer measure converge showing that insight solutions are more accurate than non-insight solutions overall, if 1.32** and of 0.38**, respectively. And the more intense the Aha! moment the more-likely it was accurate (r = .13**).
- An interaction by problem type, such that analytic problems—which involve creativity—were solved with fewer Aha! moments.
- Participants find a solution (the identity of the stimulus), they then indicate strength squeeze which indicates the sudden onset of an insight solution.
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- The Aha! phenomenology occurs as a kind of cue to signal that an idea is likely to be true given what a person currently knows and believes. Extending on the work of Metcalfe & Wiebe (1986), Salvi et al., (2016), Webb et al., (2016), and Danek et al., (2017), across a range of tasks we evaluate when and under what conditions the sudden insight experience helps individuals make accurate decisions without any conscious verification, and propose a mechanism for why the phenomenology of insight predicts objective performance. We also aim to validate a novel objective measure of the insight experience using a hand held dynamometer, and demonstrate that real-time Aha! experiences, as well as their intensity, predict confidence and accuracy without any conscious deliberation.

Experiment 2

Beyond problem solving: Insight experiences when identifying familiar aromas, songs, and faces also predict accuracy and confidence.

In experiment 2 we test the possibility that the Aha! experience, as a feeling of ‘truth’, extends beyond problem-solving to the domain of sensorial identification. In this preregistered experiment we present 60 participants with 10 aromas, 10 snippets of popular songs, and 10 famous faces. If the participant find a solution (the identity of the stimulus), they then indicate whether they experienced an Aha! moment, the intensity of the Aha! moment, and their confidence in the solution (counterbalanced).

Heuristics are most useful in times of uncertainty (Gigerenzer & Gaissmaier, 2011). Therefore, we reasoned that uncertainty could be estimated by the reaction time of participants. Through pilot testing we found that uncertainty is likely to be experienced for responses after 2 seconds for faces, 7 seconds for songs, and 6 seconds for smells. We expected the same pattern of results as in experiment 1 for uncertain trials: expected: few Aha! moments in experiment 1—the problems solved without ‘uncertainty’ would not show an accuracy benefit for Aha! versus no Aha! solutions.

Results:
- For uncertain trials Aha! solutions predict accurate decisions and higher confidence than non-Aha! solutions.
- For trials without uncertainty there is no difference in accuracy for Aha! and non-Aha! solutions, but may be partly explained by a ceiling effect.
- The predictive power of the Aha! experience is strongest in the small condition, which was also the most difficult and involved the lowest confidence in responses.

Summary of findings: In two experiments using three different problem solving domains and three different sensory identification tasks we consistently find that—where implicit processing is involved—the Aha! experience is highly predictive of accurate decisions. We propose that humans use the Aha! phenomenology as a heuristic shortcut for truth in moments of uncertainty or wherever problem solving and retrieval processes are hidden from awareness. The feeling of insight may be a highly adaptive intuition about the veracity of an idea or solution to aid quick decisions under pressure. To measure the ineffable moment of insight, the hand held dynamometer is a promising alternative to self-report measures and feelings-of-warmth. The precise mechanism behind the insight-accuracy relationship remains an open question, but we consider the possibility that the Aha! experience signals consistency or coherence with ones existing knowledge and experience.

References: