



IPSOS VIEWS

CHANGE MEANS FRICTION

**Measuring and leveraging
cognitive conflict to drive
behavior change**

**Davide Baldo
Manuel Garcia-Garcia, Ph.D.
Rich Timpone, Ph.D.**



Key takeaways

Cognitive conflict describes our mental state when we're confronted with new information that clashes with our existing experiences, attitudes, beliefs, and habits. Cognitive conflict is a crucial component of decision-making and a key driver in shifting from habitual, mindless choices to more thoughtful, conscious decisions, which can ultimately lead to changes in behavior:

01

Cognitive conflict is a key driver of behavior change: experiencing conflict between existing beliefs and new information, people are more likely to engage in deeper thinking and potentially change their future behavior.

02

Measuring cognitive conflict can predict behavior change: tools like Decision Process Tracing can identify individuals who are more conflicted and thus more likely to be receptive to change.

03

Effective interventions induce cognitive conflict: messages, experiences, and other interventions that successfully challenge existing beliefs and habits can lead to greater conflict and pave the way for long-term behavior change. Measuring cognitive conflict can help assess the effectiveness of interventions.

By understanding and leveraging cognitive conflict, businesses and policymakers can develop more effective strategies for driving positive change in consumer behavior, social attitudes, and more.



Human decisions arise along a continuum, with multiple cognitive processes operating simultaneously, ranging from more mindful to more mindless.



“Change means movement. Movement means friction. Only in the frictionless vacuum of a nonexistent abstract world can movement or change occur without the abrasive friction of conflict¹.”

Why cognitive conflict matters

We make over 200 decisions about food alone each day, and some online estimates claim we make upwards of 35,000 decisions across all aspects of our lives daily². Even if this is overstated, “we cannot deny being faced with a never-ending stream of decisions from the moment we crawl out of bed in the morning”³. With so many decisions, it is critical to note that they are not all the same. Some follow standard routines and habits while others require harder thinking and deliberation before getting to the final choice. Human decisions arise along a continuum, with multiple cognitive processes operating simultaneously, ranging from more mindful to more mindless. Academic research highlights that conflict plays a critical role in determining where we are in the mindless-

mindful continuum and how much effort we spend on each decision⁴. Measuring decision conflict allows us to:

- Understand who is more or less conflicted; predicting how prone they are to change behavior and identifying targets of risk and opportunity (i.e. risk of brand defection, and opportunities to reinforce loyalty or gain switchers from competitors);
- Evaluate the impact of interventions (from ads to messaging to policy) and compare their effectiveness;
- Anticipate how enduring changes are likely to be.

Imagine that you are shopping for your favorite ice-cream brand. You have bought it over and over again and now it has become an automatic, mindless decision. No thinking or reflection needed, you know your preference. But the context may change. For example, you notice a price promotion from another brand, or a new flavor, or your favorite brand increased its prices. Now, you may decide to switch (or not) to a different brand, but in any case, your decision-making system will now expend mental resources to reassess the different options you have before getting to the final decision. The new context has generated cognitive conflict about your choice, and this can lead to a brand preference switch. But how can we measure the amount of conflict that

is present in a decision to better predict people's behavior and behavior change? And how can we help brands understand how committed consumers are in their preferences?

In recent years, Ipsos has conducted research on the role of conflict in decision-making and the best approaches for measuring it to better predict behavior changes across different domains such as brand choice, ad effectiveness, voting, and vaccination intent⁵. We have identified three different scalable approaches, which can be deployed online, to shed light on how strong and resilient a current behavior is vs. the propensity for a change.

Measuring conflict at scale

When considering the cognitive processes of decision-making, one may naturally think of advanced neuroscience techniques such as EEG, galvanic skin response, heart rate, and facial coding, which we employ to understand psychological processes, emotions, and the impact on outcomes like advertising effectiveness⁶. While these techniques are valuable, they are not the only ones capable of uncovering insights into decision-making processes, and the importance of expanding the toolbox with validated, scalable online methods provides benefits of speed, cost, and simplification for practical problems.

Several scalable methods are capable of examining the degree of cognitive conflict which allows deep and efficient understanding of behavior and behavior change in such diverse domains as business (brand choice, advertising effectiveness, online shopping), policy (vaccine hesitancy), and politics (voting behavior).

In the following sections we provide practical examples of how these measures work and how they support better understanding of people's decisions, as well as predicting behavior and behavior change.

Decision Process Tracing

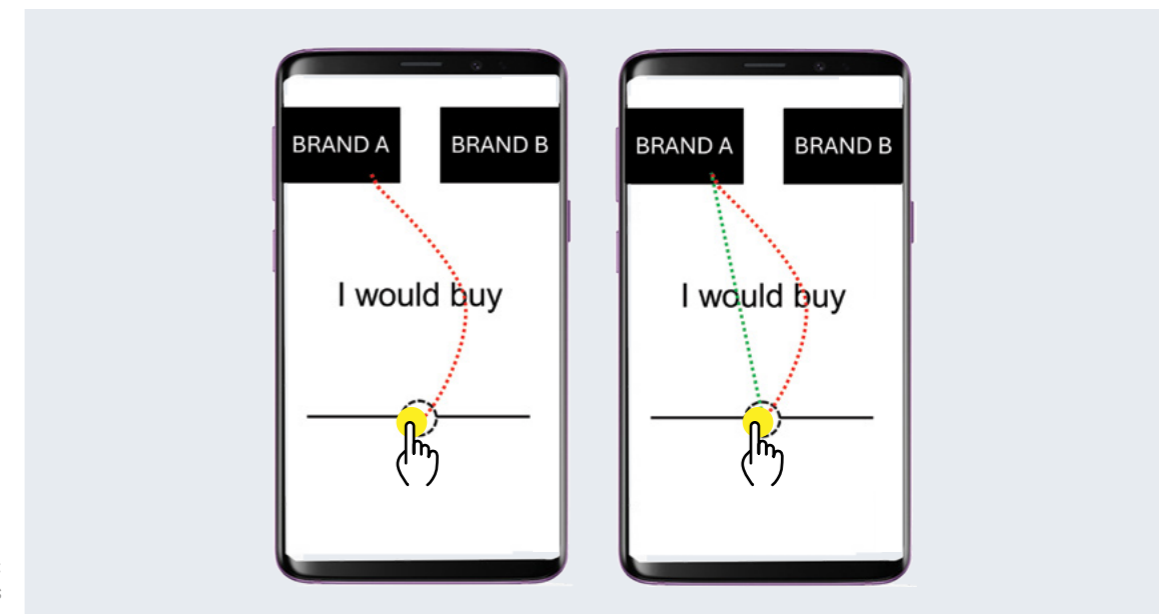
This paper focuses on Decision Process Tracing, a proprietary and patented solution developed by Ipsos⁷. This methodology measures the amount of conflict present in a decision by analyzing the physical path of a trace that people make when choosing between two options (see Figure 1). This is a variation of computer mouse tracking that has been shown to identify types of conflict, like self-control, in lab settings⁸. Different from computer mouse-tracking, the Ipsos Decision Process Tracing tool runs on mobile phones where people trace a path with their finger and the degree of drift from a straight path to a choice provides insight into how conflicted people are between options, which is predictive of

the chances for a change in behavior (e.g., a change in brand preference).

The Ipsos Decision Process Tracing tool has been able to distinguish heuristic brand selection from more deliberative brand choice, including identifying the different types of evaluation across different brands by the same individuals in the same category, providing further validation of the two-step decision process represented in the Ipsos Brand Value Creator framework⁹. It has also been able to identify where significant numbers of people's stated preferences are conflicted, and prone to change, in candidate choice in elections.

Figure 1: Examples of the process tracing solution

The respondent is asked to drag and drop the yellow ball in the selected response box. Two example responses: the green line (finger trace) reveals a committed choice, with a low level of conflict as the respondent goes straight to chosen response. The red line indicates larger conflict as this respondent shows an initial attraction to Brand B while finally selecting Brand A.



Source: Ipsos

◆ **CASE STUDY 1 – Predicting brand choice behavior change**

Every consumer has a set of preferred brands which often guide their daily shopping behavior. A key question for a brand is to determine how strong and committed their consumers' preferences are. In fact, the stronger the preference for a specific brand, the lower the chances a consumer will switch to a competitor. This highlights the two sides of understanding how committed and conflicted consumers may be. Creating conflict toward a competitor is a way to gain share; while defending brand positioning for those who currently choose your brand, but are conflicted, is important to mitigate risks. Thus, the question of whether conflict is good depends on the situation and who you ask.

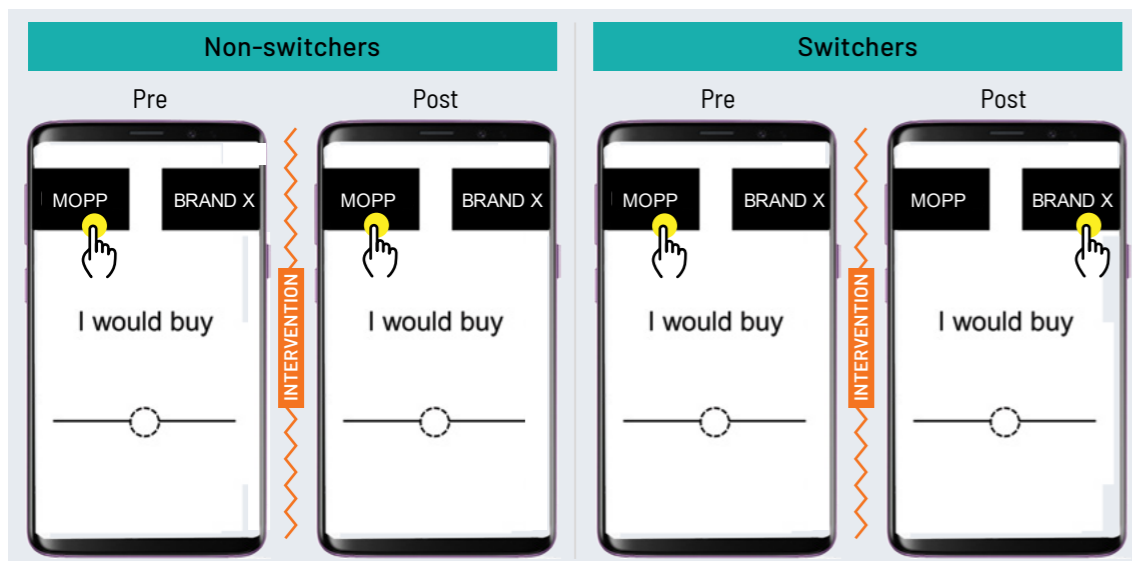
Measuring conflict is key in understanding how resilient a brand is to disruptions and capable of retaining customers. In a case

study of sport shoe selection in the United States, consumers evaluated options in comparison to their most often purchased product (MOPP). Individuals did the exercise before and after an intervention that had them reflect on the challenges and frustrations associated with their preferred brand. The intervention aimed at challenging the brand preference by inducing conflict, and allowed seeing if there was a change in brand choice. Importantly, even when people didn't change their overall preference, this uncovered how the intervention created conflict and hesitation that could be built on over time.

We used the choice behavior pre and post intervention to categorize participants as 'non-switchers', participants who did not change brand preference after the intervention and 'switchers' (see Figure 2).

Figure 2: Brand switchers and non-switchers

The MOPP (or most often purchased product) was the participant's preferred brand. During the choice task, the MOPP was presented on screen along with other brands considered for purchase.



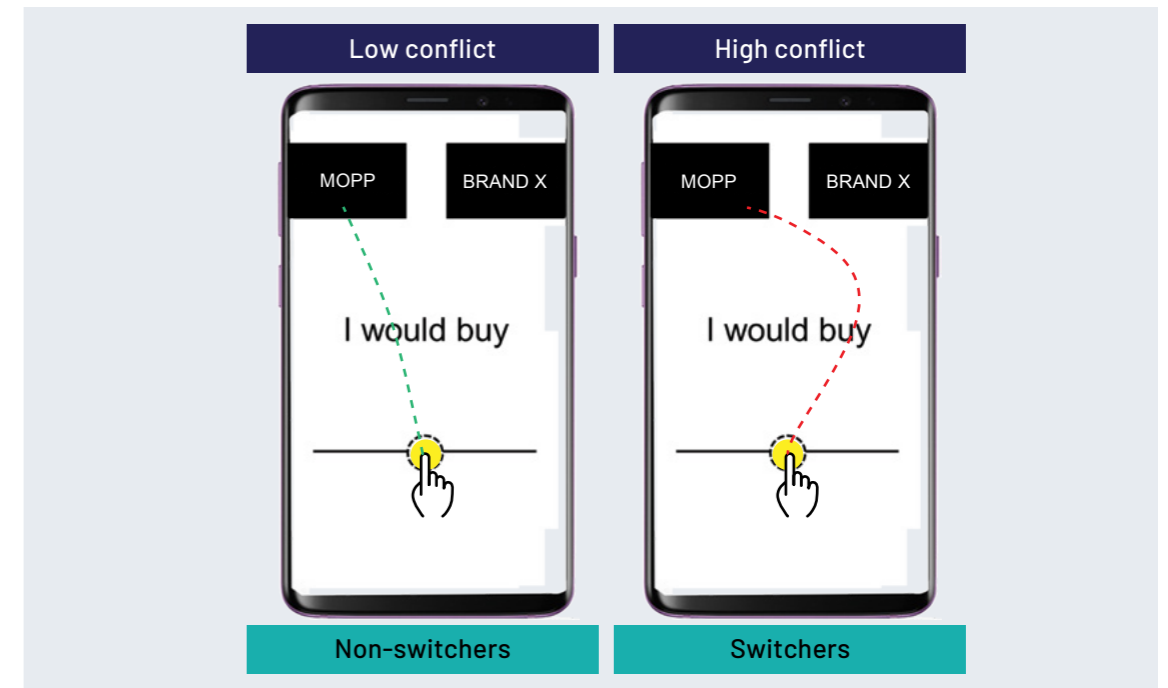
Source: Study conducted in 2021 in the United States with 833 respondents.

Critically, results showed that the finger trace pattern was predictive of behavior change: the more the participant showed conflict (deviation from a straight committed choice) based on their evaluations of brands before the intervention, the higher the chances for a brand preference switch following the

intervention (see Figure 3). That is, the more a participant showed hesitation in their support in their process trace, the less resilient was the chosen brand for that participant (higher chances of preference switch), and more susceptible to interventions like messaging, ads, etc.

Figure 3: Pre-intervention comparison

The more the participant showed conflict in selecting their preferred brand (MOPP) before the intervention, the higher the chances for a switch in brand preference after the intervention.



Source: Study conducted in 2021 in the United States with 833 respondents.

Not only does identifying those who are conflicted predict who may change their behavior due to an intervention, but the fact is that a single message or ad is not likely to change many people's choices. It is often the cumulation of touchpoint changes that leads to a change in behavior. But this is only the case if each is effectively creating conflict. The study showed that even for those who did not

change their choice of brand, that the intervention created a significant increase in conflict. As we will see in the use case on interventions to change social attitudes, this allows comparing the potential of interventions with far more nuance than just how many people change, by also examining how much conflict is induced for those who don't switch as well.

◆ **CASE STUDY 2 – Predicting candidate choice change in political elections**

In April 2022, about 49 million French voters were called to elect the new president in a two-round election (in France, unless a presidential candidate obtains an absolute majority of votes in the first round, a second round is held two weeks later between the two candidates who received the most votes).

The weeks leading to the first-round ballot saw the incumbent president Emmanuel Macron and Marine Le Pen, the candidate representing a far right party, as the most likely candidates to advance to a second round with Jean-Luc Mélenchon (a far left candidate) in third position with a gap of 10% from Macron and 5% behind Le Pen.

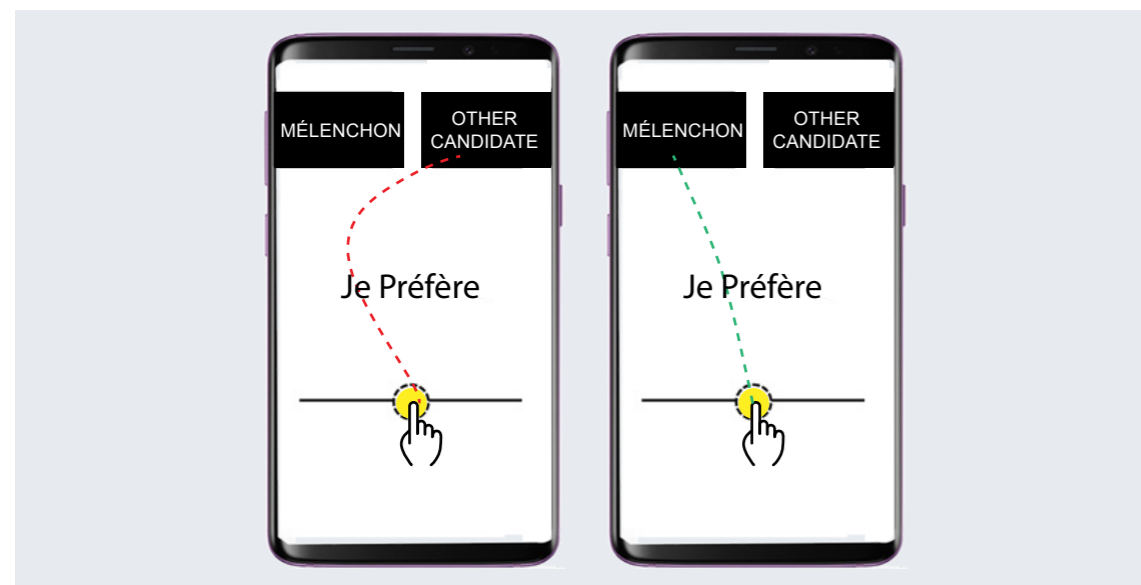
Views were that French voters had effectively made up their minds that Macron and Le Pen would face each other

in the final round. But measuring how conflicted voters were, provided more insight into how stable preferences were versus chances for a change during the days prior to election day.

As part of the Ipsos poll one week before the first round of the election, we included the Ipsos Decision Process Tracing tool to determine the level of commitment and doubt around candidate preferences. Each participant was presented with all possible combinations of candidates and asked to select their preferred one for each pair. First, we analyzed the finger trace behavior for the non-selected candidates (see the left example in Figure 4). That is, we evaluated the level of attraction to non-selected candidates where the larger the attraction, the larger the chances for future switch in choice.

Figure 4: Appeal of Mélenchon seen whether selected or not

Respondents were asked to select the candidate they prefer (*Je Préfère*) between the two presented on screen. When Mélenchon was an option but not selected, this was done with hesitancy; but when preferred, the selection was made with the most conviction of any candidate.



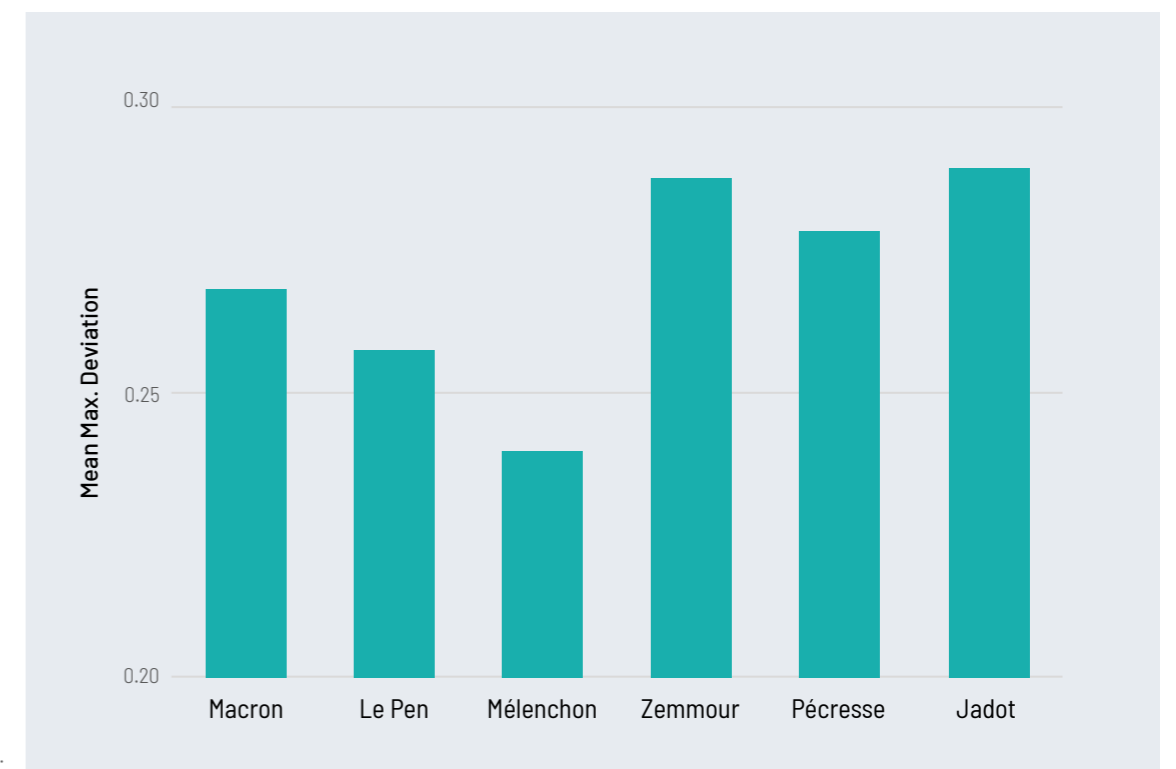
Source: Representative survey of the French population with 1,326 respondents.

Results highlighted that Macron and Mélenchon showed the largest deviations of the finger trace when not selected. In other words, voters not selecting these two candidates still showed more attraction to them than the others in the field.

On the other hand, looking at the trace when each candidate was selected allows seeing how committed individuals were to their preferred candidates in each pair. In this case, the smaller the deviation, the larger the conviction (lower conflict) in selecting a candidate (see Figure 5). Results showed that voters selecting Mélenchon did so with the highest conviction as indicated by the smallest deviation from a straight line in the traces.

Figure 5: Level of conviction of candidate choice

When looking at the finger trace in selecting the different candidates, Mélenchon was the candidate that was selected with the highest conviction (small deviation from the straight line leading to the response box).



Source: Representative survey of the French population with 1,326 respondents.

Measuring how conflicted voters were provided more insight into how stable preferences were versus chances for a change during the days prior to election day.

Summing up, Process Tracing highlighted that one week prior to election day:

- 01 Voters selecting Mélenchon, did it with higher conviction (lower conflict).
- 02 Voters not selecting Mélenchon, showed more doubt in their choices and were attracted to him.

In other words, while Mélenchon showed the lowest probability of losing voters during the week leading to the French election across candidates, he also showed the highest chance of attracting new voters. As anticipated by Decision

Process Tracing, Mélenchon did show an astonishing performance during the days prior to the election, gaining 6% of voters and nearly closing the gap with Marine Le Pen, who in the end took the second position by just 1.2%, compared to 5% a week before election day.

Again, we see that the larger the conflict present in a decision, the higher the chance for a change in behavior. In addition, these insights allow pinpointing not only who is prone to change their behavior but also against which specific alternatives.



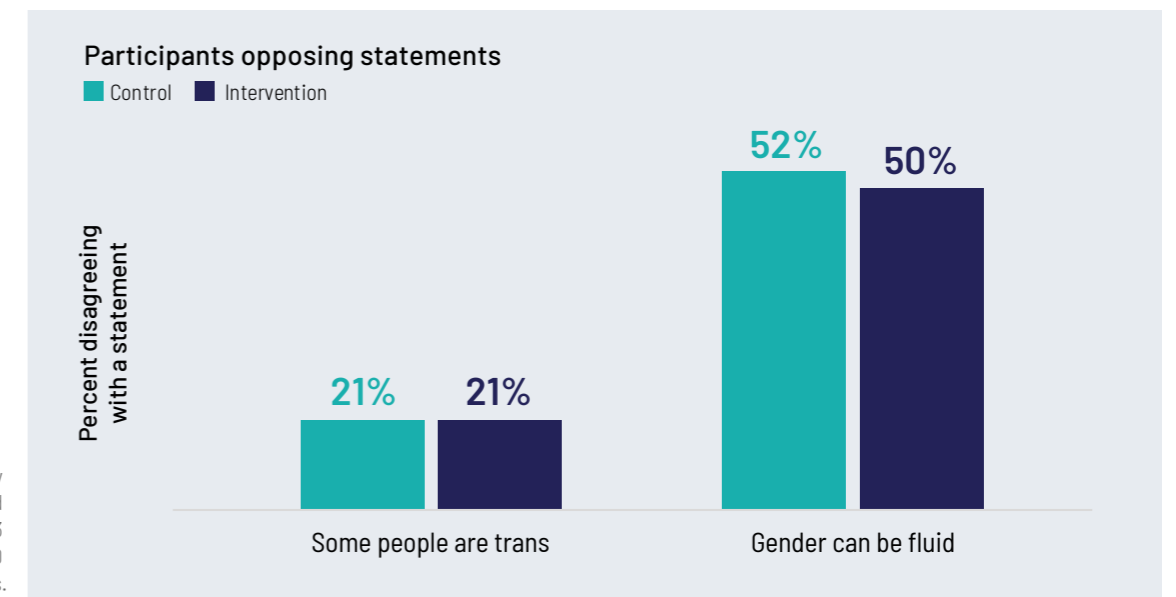
The larger the conflict present in a decision, the higher the chance for a change in behavior. In addition, these insights allow pinpointing not only who is prone to change their behavior but also against which specific alternatives.

◆ CASE STUDY 3 – Identifying the impact of interventions on social attitudes

Psychologists have demonstrated that changing people’s attitudes is challenging when specific belief systems, values, and convictions are strongly held¹⁰. One area that has become increasingly polarizing in recent years is beliefs around gender. In this case study we examined the effect of interventions on attitudes of whether gender is fluid or fixed¹¹.

Here, we tested the impact of an intervention that exposed respondents to statements about thoughts of trans individuals to encourage deeper empathy. Consistent with findings from past research (see Figure 6), the impact of a single intervention like this did not have the power to change such deeply rooted attitudes as whether gender is fluid or fixed.

Figure 6: When looking at the stated levels of disagreement, the intervention had no impact on changing explicit attitudes

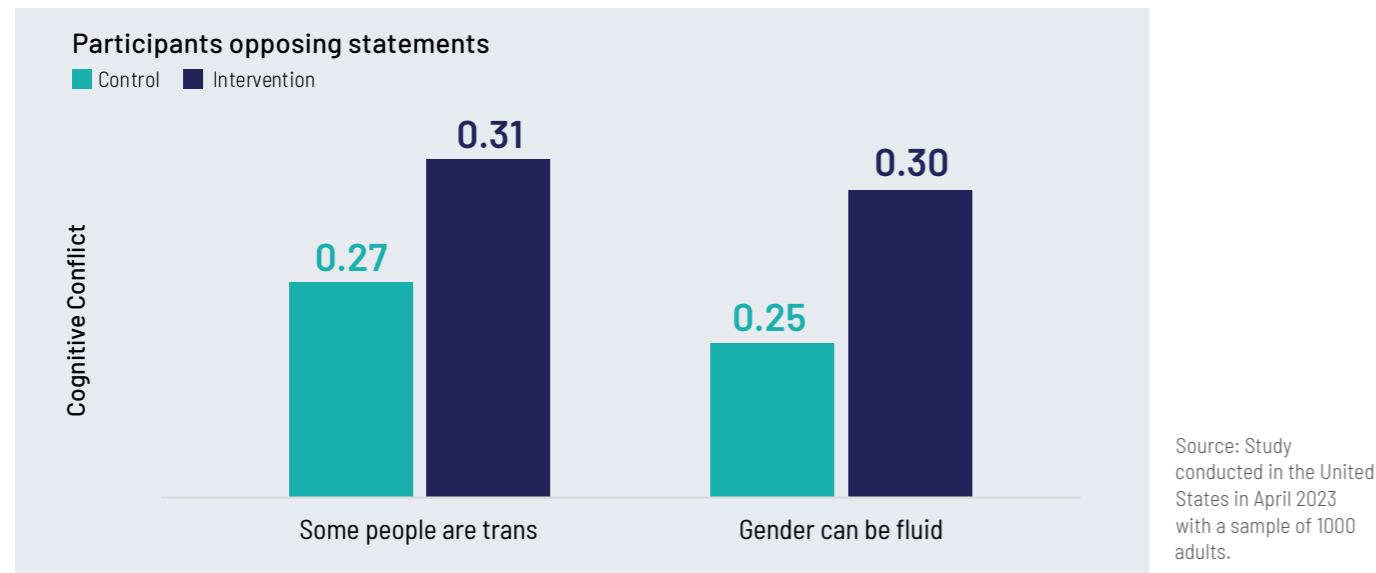


Source: Study conducted in the United States in April 2023 with a sample of 1000 adults.

While there was no meaningful impact of the intervention on explicit agreement with the statements around gender, that does not mean there was no effect. As shown in the earlier case studies, below the level of explicit agreement there may be differing levels of conflict in beliefs, and this may include impacts even if the threshold of formal behavior change is not reached. That is exactly what was found.

Figure 7 shows that while explicit attitudes do not change, people who oppose beliefs supporting gender fluidity demonstrate greater cognitive conflict if they were exposed to the intervention than if they weren't. Since process tracing reflects one's agreement with a statement, the greater conflict here is a direct reflection of attraction to the alternative, revealing the positive effect of the intervention.

Figure 7: Examining attitudes supporting gender fluidity, exposure to the intervention significantly increases cognitive conflict for those who oppose these views



Again, a single intervention, whether a message, communication, advertisement or other, is often not enough to directly lead to behavior or attitude change, but effective interventions can build up over time to lead to change. Measuring cognitive conflict helps to identify

which interventions are effective. In this way testing multiple interventions, policies, campaigns etc. can help identify which are more effective in evoking the intended conflict to better choose among alternatives.

Other approaches to measuring cognitive conflict

While the case studies in this paper demonstrate the power of the new Ipsos method of process tracing, we have demonstrated other scalable approaches to identify cognitive conflict in the past.

Reaction time. Measuring reaction time has a long history in psychological research and provides an intuitive approach to understanding where decision-making falls in the more automatic to more

deliberative continuum. Given the insights into decision-making and conviction, we incorporate reaction time into a number of our services at Ipsos and have described these previously¹². In multiple studies we have shown that identifying which individuals are more conflicted and slower in deciding among choices before an intervention, such as an effective advertisement, is predictive of who is most likely to change their choice after the intervention.



Anticipated regret. While the first two measurement approaches to understand how conflicted people are in their decision-making are scalable measures of process and time, the final one shows that some insight into cognitive conflict can be obtained directly from survey questions. It is clear that we can't directly ask people how conflicted they are, as they would certainly understate this as shown in numerous studies and psychological frameworks¹³. However, questions about outcomes they would regret are highly insightful and predictive.

Regret is special in the domain of emotions as it is counterfactual and comparative in nature. By definition, it

evaluates a real or hypothetical situation in comparison to another¹⁴. Regret allows us to reflect on what could have happened in contrast with the actual outcome, forcing us to operate outside of our automatic, mindless thinking and it has both strong emotional and rational components^{15,16}. This counterfactual thinking is also activated when we consider the regret we may feel if a future action or decision has an undesired outcome – especially when this situation is loaded with uncertainty. This is known as 'anticipated regret' and is more predictive than other survey measures. It has been used in areas from choice of social media platform, vaccination hesitancy, and voter turnout, and we have produced overviews specifically on this measure previously¹⁷.



Identifying which individuals are more conflicted and slower in deciding among choices before an intervention is predictive of who is most likely to change their choice after the intervention.



Conclusion

It should be clear from these case studies that cognitive conflict is closely linked to behavior change. This is critical for both understanding and practical action. Brands have leveraged this information to understand who is conflicted in their current views and profiled them for targeting, both to protect against defection and to lure consumers away from competitors.

Knowing who is at risk of change is not only valuable for designing programs, but examining different interventions to see which are most effective in inducing conflict can help to plan more effective long-term campaigns and understand whose behavior is likely to revert back.

These insights have shown actionability in domains as diverse as public policy, brand building, targeting creators, voting behavior, and advertising effectiveness.



But beyond demonstrating the practical impact of understanding conflict, this paper has summarized years of work on different scalable methods that can be incorporated into online research and be leveraged for practical value. While many use reaction time, Ipsos is unique in tying this to cognitive conflict and bringing it into the research portfolio with our work developing questions on anticipated regret and our process tracing offer. Leveraging this toolbox with conviction will more effectively lead to desired behaviors by better understanding the psychological processes that underpin them.

Endnotes

- 1 Alinsky, S. (1971) Rules for Radicals: A Pragmatic Primer for Realistic Radicals. New York : Vintage books.
- 2 Wansink, B., and Sobal, J. (2007) "Mindless Eating: The 200 Daily Food Decisions We Overlook." Environment and Behavior. 39(1): 106-123.
- 3 Krockow, E.M. (2018) "How Many Decisions Do We Make Each Day?" Psychology Today. September 27. <https://www.psychologytoday.com/us/blog/stretching-theory/201809/how-many-decisions-do-we-make-each-day>

- 4 Houdé, O. (2019). 3-System Theory of the Cognitive Brain: A Post-Piagetian Approach to Cognitive Development. London and New York : Routledge.
- 5 Venkatraman, V., Timpone, R., Garcia-Garcia, M., Godard, O., Baldo, D., Schoeller, M., Strong, C., and Ansons, T. (2020) "Disrupting System 1 Thinking: Better Science for Smarter Marketing". Paper presented at the annual ESOMAR meeting.
- 6 Baldo, D., Viswanathan, V.S., Timpone, R.J., and Venkatraman, V. (2022) The Heart, Brain, and Body of Marketing: Complementary Roles of Neurophysiological Measures in Tracking Emotions, Memory, and Ad Effectiveness. Psychology & Marketing. 39(10): pp1979-1991.
- 7 Baldo, D. and Timpone, R. (2024) Systems and Methods for Decision Process Tracing for Measuring Conflict. U.S. Patent Application No. 18/342,362. Filed June, 2023.
- 8 Stillman, P. E., Medvedev, D., & Ferguson, M. J. (2017) Resisting temptation: Tracking how self-control conflicts are successfully resolved in real time. Psychological Science, 28(9), 1240-1258.
- 9 Fortin, I. (2018) Introducing Brand Value Creator. <https://www.ipsos.com/en/introducing-brand-value-creator-bvc>
- 10 Stanovich, K.E. (2021) The Bias That Divides Us. Cambridge, Mass., and London: MIT Press.
- 11 Nowlan, L, Baldo, D. and Garcia-Garcia, M. (2024) Using Behavioral Science to Uncover the Nonconscious Building Blocks of Attitude Change. In Neuromarketing Yearbook 2024, NMSBA.
- 12 Garcia-Garcia, M. Ho, C., Freeman, H., Mu, J., Naert, S., and Brown, A. (2021) Time to Decide: Measuring Response Time for Innovation and Brand Growth. Ipsos Views.
- 13 Fiske, S.T. and Taylor, S.E. (1991) Social Cognition, second edition. New York, St Louis: McGraw-Hill, Inc.
- 14 Pink, D.H. (2022) The Power of Regret: How Looking Backwards Moves Us Forward. New York: Riverhead Books
- 15 Coricelli, G., & Rustichini, A. (2010) Counterfactual thinking and emotions: Regret and envy learning. Philosophical Transactions of the Royal Society B: Biological Sciences, 365(11538), 241-247.
- 16 McCormack, T., Feeney, A., and Beck, S.R. (2020) Regret and decision-making: A developmental perspective, Current Directions in Psychological Science, 29(300): 346-350.
- 17 Baldo, D. and Schoeller, M. (2022) Anticipated Regret in Decision-Making and Behavior Change. In B.B. Briesemeister & W.K. Selmer, eds., Neuromarketing in Business: pp 127-140. Wiesbaden: Springer Fachmedien Wiesbaden.

AUGUST 2024

CHANGE MEANS FRICTION

Measuring and leveraging cognitive conflict
to drive behavior change

AUTHORS

Davide Baldo

Global Research & Development
Lead, Experimental Research, Ipsos

Manuel Garcia-Garcia, Ph.D.

Global Lead of Neuroscience,
Global Science Organisation, Ipsos

Rich Timpone, Ph.D.

Head of Global Science
Organization, Ipsos

The **IPSOS VIEWS** white
papers are produced by the
Ipsos Knowledge Centre.

www.ipsos.com

@Ipsos

