


The Insight Advantage  
of Measuring the  
Consumer Subconscious

# Is it implicit?

THE SENTIENT DECISION SCIENCE  
WHITE PAPERS SERIES  
SPRING 2014

Aaron Reid, Ph.D.






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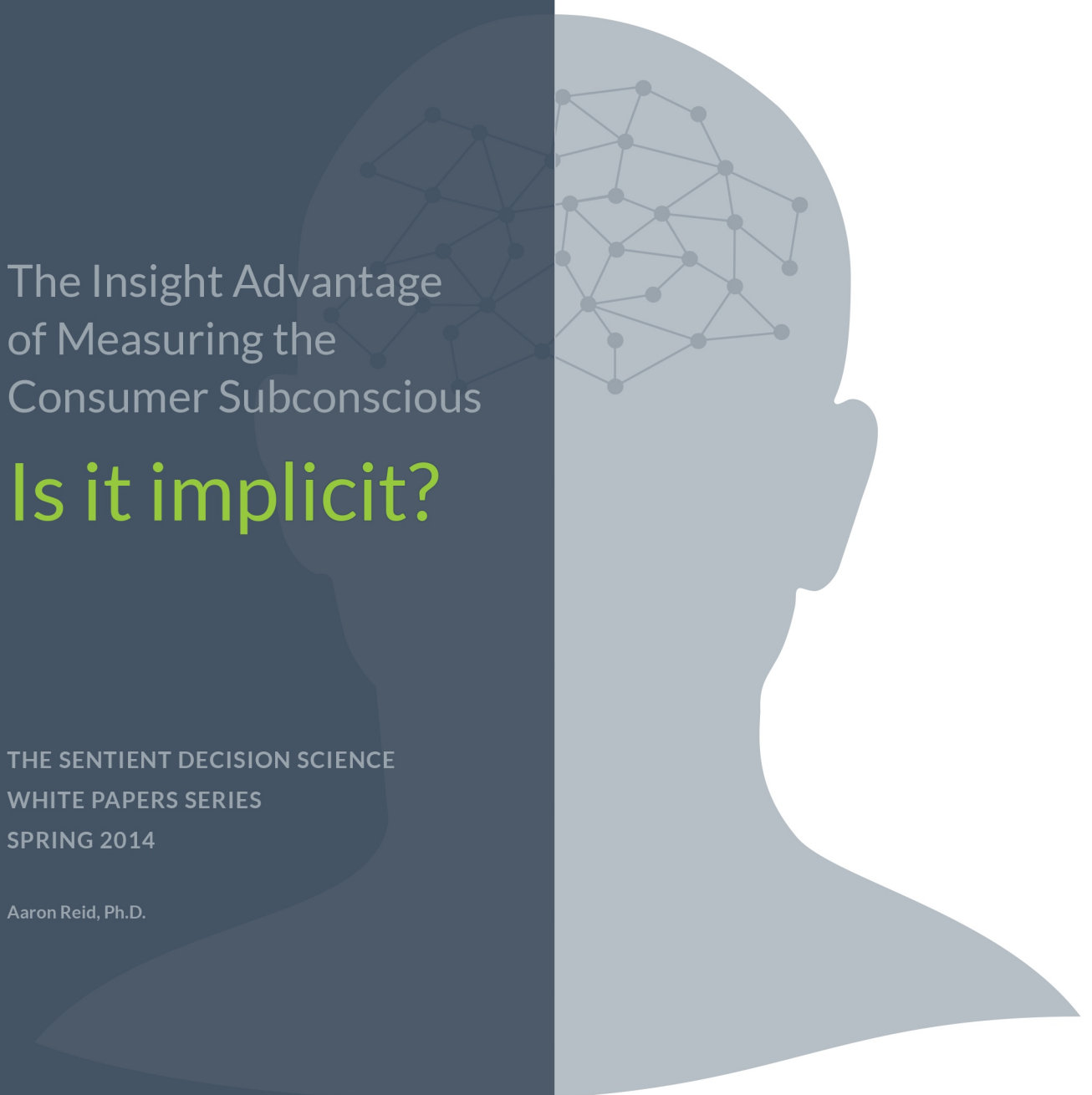
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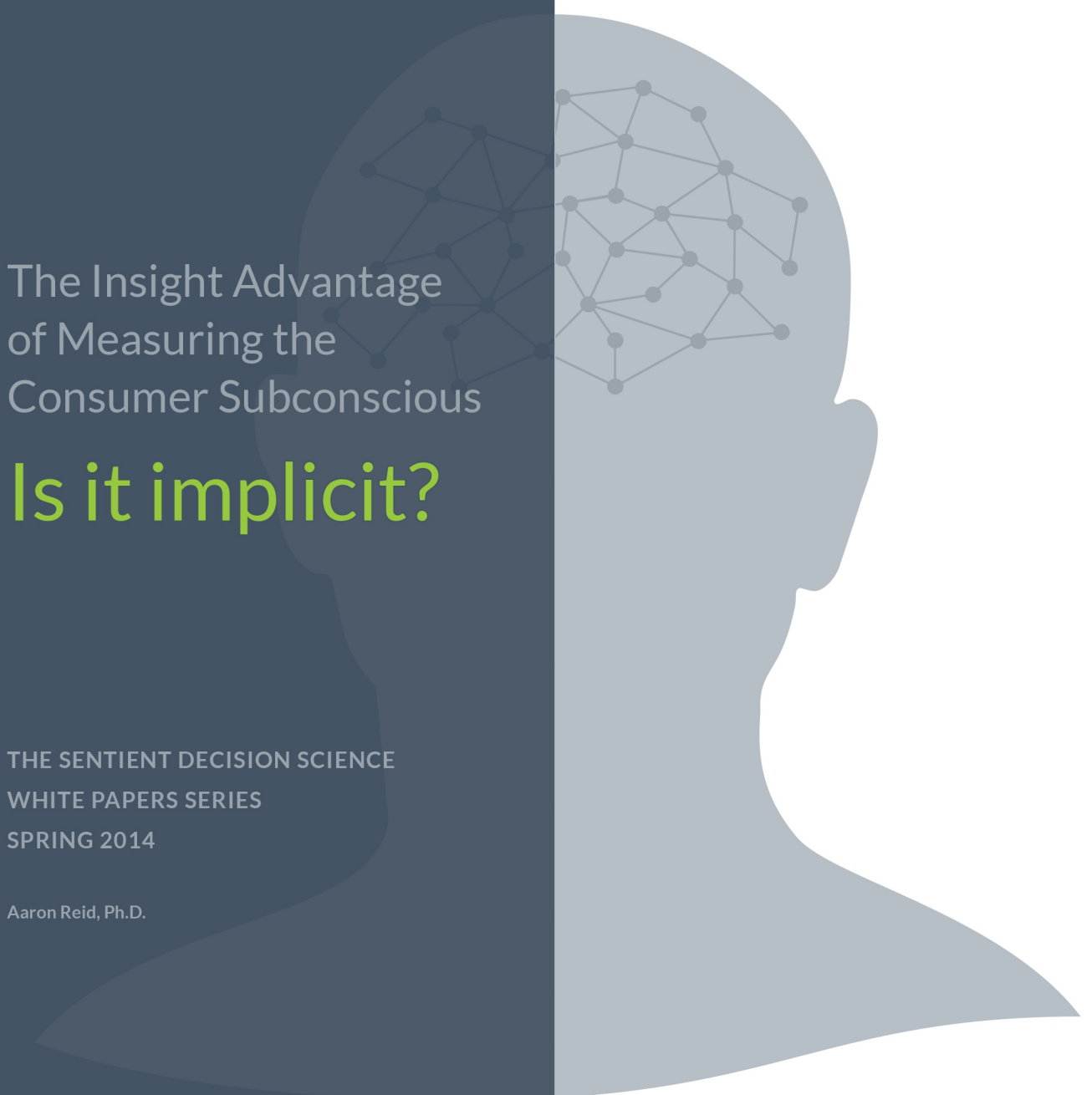


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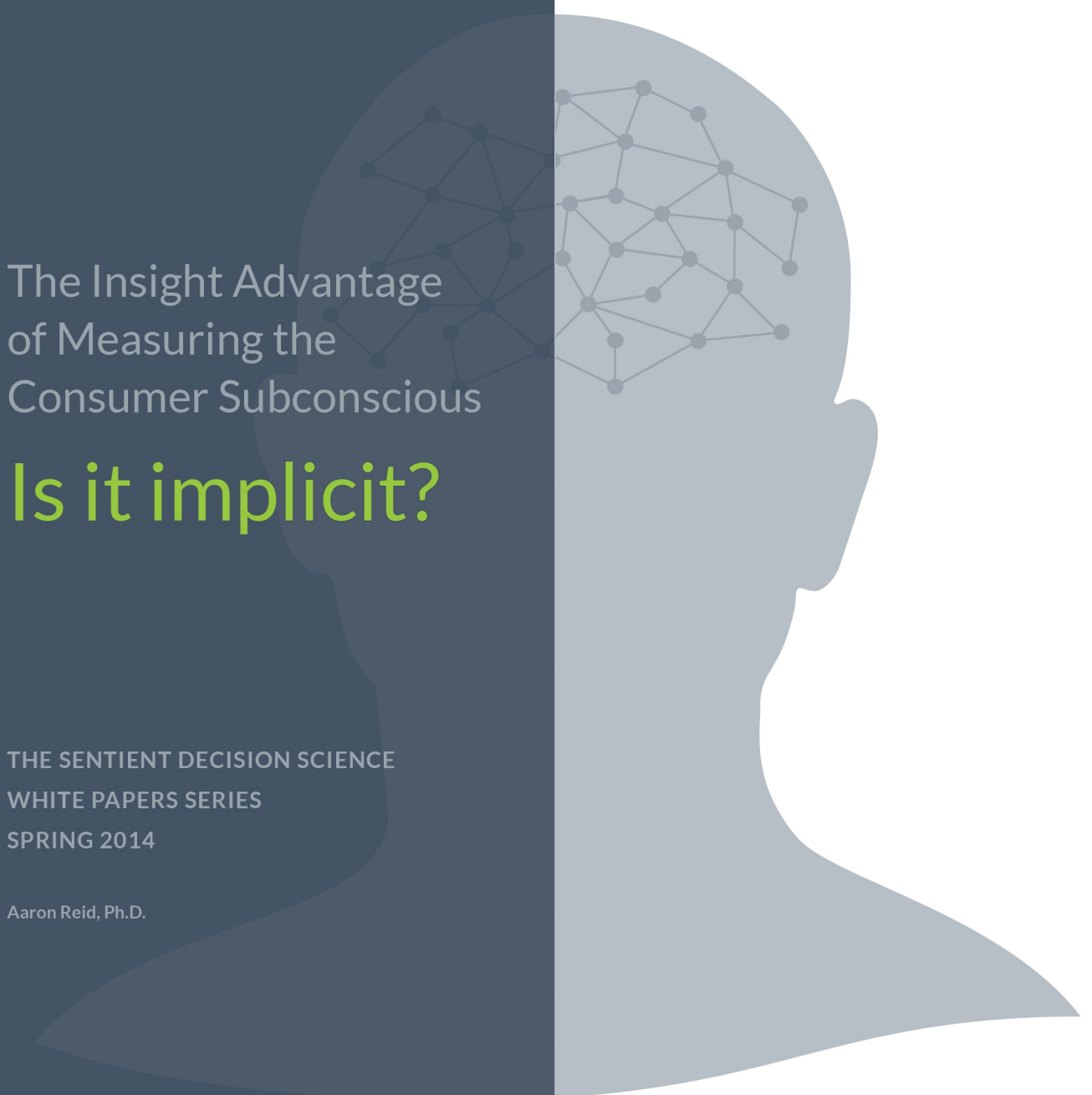
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# No Accident

BUSINESS IS BENEFITING FROM ADVANCES IN BEHAVIORAL SCIENCE.

*“And yet for all this help of head and brain  
How happily instinctive we remain,  
Our best guide upward further to the light,  
Passionate preference such as love at sight.”*

*(Excerpt from “Accidentally on Purpose”, Robert Frost)*

Frost’s finish to *Accidentally on Purpose* could be an observation of individual level consumer decision-making. We instinctively make choices throughout our days, without much deliberate interference by our conscious “System 2” thinking<sup>1</sup>. It could also serve well as an observation of a lot of business decision-making. Executives, and managers alike, often going with gut feelings even in the face of well reasoned argumentation.

Fortunately, for businesses who profit from accurately predicting behavior, recent advances in measuring consumer instinct are now providing executives and managers with more precise forecasts of future business. This is no accident. The

last twenty years of academic research in behavioral science has given rise to theoretically rigorous and experimentally validated subconscious measurement tools. These tools have been adopted by the innovators in business and researchers have now shown that, when combined with our best explicit measures, implicit measures offer a more complete explanation of the drivers of consumer behavior and in doing so are more accurately forecasting future sales.

Many progressive insights divisions are putting these quantitative implicit research techniques into practice. Yet, according to the GRIT Winter 2014 report, implicit research technologies are

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<sup>1</sup> “System 1” and “System 2” processing are terms coined by Strack & Deutsch (2004) and popularized by Kahneman (2011) referring to our fast, automatic, associative, subconscious processing (1) versus our slow, deliberate, logical and propositional processing (2). The vast majority of human thought occurs below the level of conscious awareness in System 1.

still in the early adoption phase for the industry overall. From a product adoption curve perspective, in order for implicit measurement techniques to cross the chasm to broader adoption in market research, many important questions for insights managers and marketers need to be answered regarding implicit research techniques including:

- What qualifies as an implicit research technique?
- What insights can implicit research techniques provide above and beyond explicit techniques?
- Should implicit techniques be combined with traditional explicit techniques, including when and how?
- What are the appropriate use cases of implicit research techniques?

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#### IN ESSENCE.

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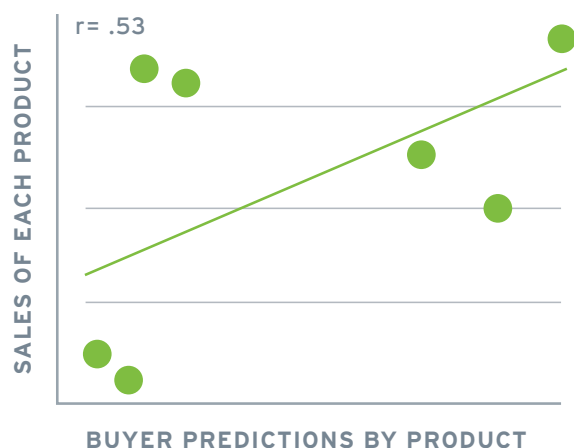
*This paper draws on new knowledge coming out of the Sentient Consumer Subconscious Research Lab to provide a practical industry definition of implicit research techniques, detail the best use cases for each technique, and demonstrate how combining implicit and explicit measures in a single model more accurately forecasts consumer behavior.*

## Let's start with the endgame...

# Show Me the Science<sup>2</sup>

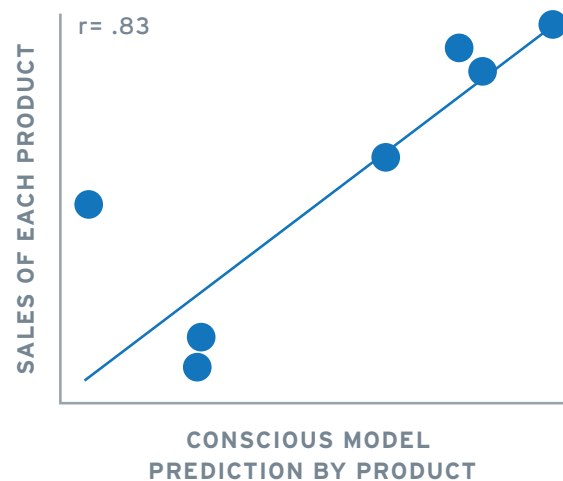
Imagine the following scene from an executive committee meeting, you are the VP of Insights, and have been asked by the CMO to be prepared to show data from your most recent market research project...

It's the end of the quarter and the executive committee is reviewing the sales numbers for a new line of products that were just introduced to the market. The buyers had identified what was going to be hot and had bought stock in proportion to what they had forecast would sell the most and least. During the review, an analysis showing the "accuracy" of the forecast by plotting the "buy" for each product against actual sales reveals a correlation of  $r = .53$ , accounting for 28% of actual marketplace sales. "Not bad," someone quips, "at least we're better than chance!"



After an uncomfortable silence, the CEO asks the room "How can we get a better handle on how successful these products are going to be before we go to market?" The CMO cues you to present the results from your recent behavioral science based forecasting study.

"Consumer research is a good place for us to start," you begin. "Here you can see the power of deriving insight on product success by analyzing consumer choices in pre-market hypothetical trade-off situations," detailing the results from a choice based conjoint model showing the  $r = .83$ , accounting for 69% of actual marketplace sales.

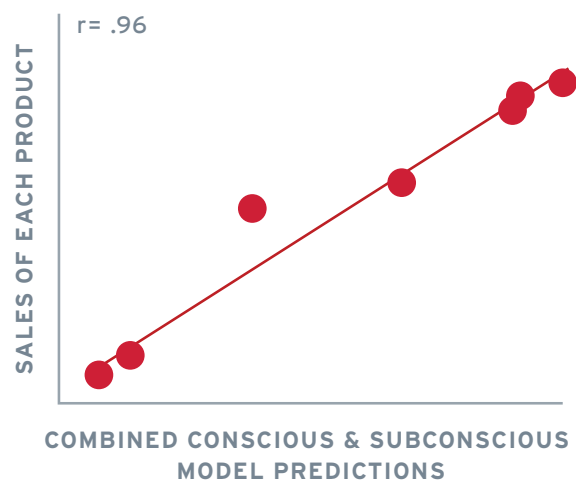


<sup>2</sup> Results from this case study reflect actual in-market sales, "the buy" or stock levels of each item, and predictions based on an actual research project with a Sentient client in retail fashion sales. The paper was recognized as a best paper by ESOMAR. (Reid & Graiko, 2010).

“However,” you continue, “it turns out that this conscious preference measure is only part of the picture. Recent advances in behavioral science have enabled us to quantify the impact of emotion on choice, and by measuring the emotional reaction to new products and combining that data with our conscious trade-off measures, we’re able to much more accurately forecast consumer behavior in the marketplace.”

“Do tell.”

“Here you can see the predictive advantage of incorporating these subconscious, or “implicit”, measures into our quantitative choice models.”



You explain, “By measuring the degree of emotional associations with products, we’re able to account for nearly 95% of actual in-market sales” as you show the strong correlation  $r=.96$  of these emotionally weighted predictions with in-market sales.

Given the fact that you now have the full attention of the committee, you continue, “This approach can help us not only with inventory management of products slotted for our buys, but also with new product development, identifying winners and losers long before we spend the resources necessary to bring them to market.”

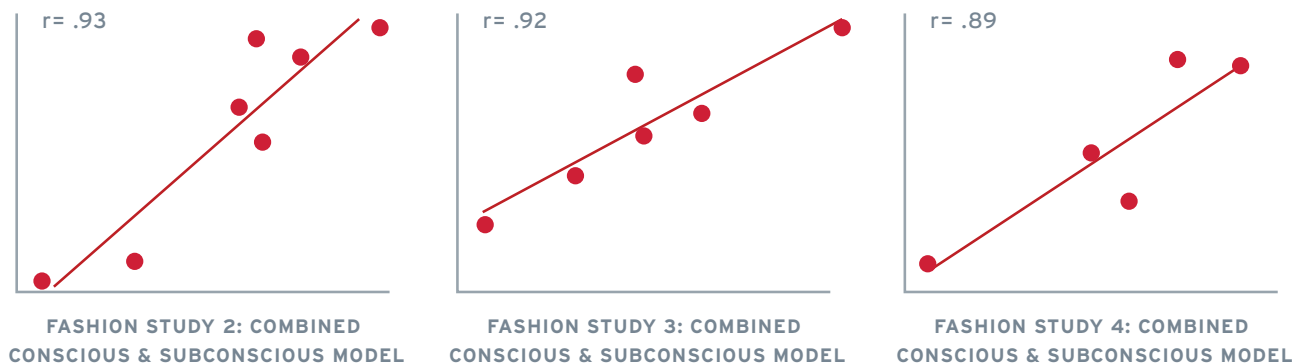
“Is this just one study, or do you have additional evidence of the accuracy of this approach?” asks the CEO.

“We do have additional evidence,” injects the CMO. “Let’s take a look at the predictive accuracy on the other product lines we tested.”

“Absolutely. Here are the charts showing the predictive accuracy of quantitative models which combine subconscious emotional data with conscious consumer preferences,” you say with great confidence as you cycle through three more studies showing correlations of .93, .92 and .89 of the research forecasts with actual in-market sales.

“Why aren’t we using this approach for all of our new concept testing and product forecasting models?” asks the CEO.

“Implicit research techniques are still in the early adoption phase in the market research industry,” the CMO replies “and we’re being very careful in our vetting of new vendors. It appears that many young companies are rushing to market with new techniques claiming to tap the consumer subconscious.”



The CEO begins to look concerned.

“We’re evaluating the leading suppliers in this space and we’re using scientific integrity coupled with practical business application as our most important selection criteria.”

“Why are we placing so much importance on the science behind the techniques?” asks the Chief Financial Officer, “We’re not paying more just for a bunch of Ph.D.’s to make us feel good about what we’re doing, are we?”

“While the application of these approaches to business is relatively new, the behavioral sciences have been refining the techniques for over 30 years,” the CMO explains. “We want a supplier who understands that science and couples it with business acumen, so we’re certain that the results from the research will provide us with novel insight, and more accurately forecast

consumer behavior. From a financial prudence perspective, it makes sense for us go with a firm that leverages that knowledge rather than a firm with a fancy new model based on the latest popular science book.”

She went on, “It turns out that there are very specific criteria that need to be met for a measure to be truly implicit. Furthermore, if we’re not truly measuring the subconscious, there is no guarantee that our measures will be adding novel insight and the predictive accuracy we’ve shown here.”

“Great, I’ll look forward to reading your executive summary on what qualifies as a true implicit measure, why it matters for us, and how you intend to incorporate it into our insights practice” transitions the CEO, “Now let’s talk about forecasts for Q2...”

# Is It Implicit?

If the science of implicit is that important, what does the science tell us qualifies as a truly implicit research technique? Fortunately, the behavioral science literature has 30 years of research and theory published on the topic, and so the answer is readily available to be applied to business.

Nosek, Hawkins and Frazier (2011) provide a recent summary definition and add value by detailing the conditions where implicit research techniques are able to unearth different insights than traditional measures. The authors provide evidence that insights from explicit techniques are limited, when people have the following limits.

## 1 LIMITS IN THEIR MOTIVATION

This could be lack of motivation to answer honestly due to self-presentation concerns, or motivation to take the question as the researcher desires.

## 2 LIMITS IN THEIR OPPORTUNITY

For example, an explicit measurement tool may not allow respondents to express their true degree of feeling about an evaluated item.

## 3 LIMITS IN THEIR ABILITY

Including difficulty to articulate their thinking or feeling into a reported response.

## 4 LIMITS IN THEIR AWARENESS

Respondents may not be consciously aware of their attitudes or drivers of their behavior.

Nosek et al. argue that implicit research techniques are able to account for each of the above “can’t say/won’t say” limitations<sup>3</sup>. The authors then provide a broad definition of implicit techniques as those that are NOT “direct, deliberate, controlled, intentional self assessments”<sup>4</sup>.

This definition provides market research with useful criteria for evaluating whether a measure is implicit or not. However, it is important to note that even within the implicit literature authors are making arguments around the “strength of implicitness” in a measure (De Houwer et al. (2009)), indicating that there is not currently a pure implicit measurement, but rather there are degrees of “implicitness” in measures. For example, biomeasures,

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<sup>3</sup> I agree with the authors with one caveat that while implicit techniques may outperform explicit techniques on #2 (i.e. relieving limits in opportunity), implicit techniques can still suffer from limiting opportunity just as any measurement method can.

<sup>4</sup> De Houwer et al. (2009) offer a much more detailed account of the requirements of an implicit technique which align on the broad characteristics summarized by Nosek et al. (2011).



such as galvanic skin response (GSR; i.e. the degree to which your skin is producing moisture), are partially controllable given the right conditions (e.g. motivation, awareness and practice)<sup>5</sup>. Thus, GSR while appropriately characterized as implicit, is

not purely implicit in the strictest definition of the term. The same is true for some of the better known behavioral response time based implicit measures, including the venerable IAT. In fact, De Houwer et. al (2009) argue that...

*“the available evidence does not allow for the strong conclusion that IAT effects are implicit in the sense of being always independent of the goals to avoid or alter the expression of the to-be-measured attribute. Nevertheless, it does seem to be the case that IAT effects are more difficult to control than are most traditional (questionnaire) measures.”*

The idea of degree of controllability is very useful in evaluating how good a measure is at capturing implicit insight. If we create a simple table and evaluate techniques along the broad dimensions forwarded by Nosek et. al (2011) we have a useful tool for assessing the implicitness of a measure.<sup>6</sup>

| Research Technique   | Indirect | Unintentional | Degree of Control | Is it Implicit? |
|--|----------|---------------|-------------------|-----------------|
| Neuro (EEG,fMRI)   | ✓        | ✓             | Extremely Weak    | ✓               |
| Bio (GSR, Heart-rate)  | ✓        | ✓             | Extremely Weak    | ✓               |
| Affective Priming  | ✓        | ✓             | Very Weak         | ✓               |
| Implicit Association Test  | ✓        | ✓             | Weak              | ✓               |
| Discrete Choice Measures   | ✓        | ✗             | Strong            | ✗               |
| Timed Discrete Choice Measurese  | ✓        | ✗             | Strong            | ✗               |
| Timed Judgements of Associations   | ✓        | ✗             | Strong            | ✗               |
| Timed Judgements of Associations within Restricted Response Time Windows | ✓        | ✗             | Moderate          | ✗               |

<sup>5</sup> Given that current evidence of human ability to control neurological and physiological responses through bio-feedback is very limited, it stands to reason that Neuro and Biometric measures are among the best measures on the criterion of “uncontrollable”

<sup>6</sup> Chapter 5 gives more detailed descriptions and best use cases of several implicit research techniques.

First, the table provides some very quick insight that **indirect does not equal implicit**. For example, discrete choice studies are great indirect measures that provide derived insight on preferences, however, they are conscious choices on the items being evaluated and therefore do not fit the other implicit criteria.

Second, the table also reveals that a lot of new-to-market **techniques that simply measure response times of an evaluation, or solely require quick responses, are not implicit**.

For example, having participants very quickly indicate whether an image or word represents some category or experience, and timing their response, is an indirect measure. However, it is an indirect measure

of their conscious assessment, not an implicit measure of their subconscious (or automatic) association. We call this a “fast explicit” technique.

Defining which measures are implicit versus simply indirect is important because, as we will see in the case studies below, implicit measures are providing researchers with insights into drivers of behavior that explicit measures are not. Consistent evidence in the behavioral science literature also shows that implicit measures are accounting for different variance in the behavior of interest than explicit measures (Banaji, et. al., 2004, Nosek, 2007). This means that Insights managers will want to ensure that the measures are in fact implicit in order to maximize the opportunity for subconscious insights.



*“...implicit measures are providing researchers with insights into drivers of behavior that explicit measures are not. This means that Insights managers will want to ensure that the measures are in fact implicit in order to maximize the opportunity for subconscious insights.”*

TWEET THIS

@SENTIENTINSIGHT

# Is Oatmeal an Emotional Choice?

Our first case study, and narrative around the executive committee meeting showed the highly predictive nature of implicit emotional measures for products in the retail fashion space. We're often asked if implicit techniques are really just useful for those kinds of obviously highly emotional decisions. The real answer is that our subconscious is involved in every decision we make, whether that is for the brand of clothes we buy, or our decision to buy a house, or which career we should pursue. But to illustrate just how pervasive the subconscious is in influencing our decisions, we wanted a study of a product that is relatively bland. So we chose oatmeal.



The following case study from the Sentient Consumer Subconscious Research lab, illustrates:

- the importance of having a truly implicit measure of the subconscious in your research studies and,
- how to effectively combine implicit and explicit data into a single, more predictive, consumer behavior forecasting model.

The first phase of the research project was designed to answer the following questions:

1. Would derived conscious preference measures of products correlate with actual product sales data?
2. Would implicit emotional association measures with products correlate with actual product sales data?
3. Would combining the derived conscious preference measures with the implicit measures produce a more accurate model of sales data, with each measure accounting for some unique variance?

Once the predictive accuracy of the conscious, subconscious and combined models was validated in phase one, the Sentient scientists designed the second phase of the research to go even deeper in distinguishing the relative value of implicit and explicit measures. Specifically, the study was designed to answer the following question:

4. Are explicit emotional slider measures and "fast explicit" time restrained response latency measures unique from derived preference to the same degree as truly implicit emotional association measures?

The purpose of phase 1 of the research was to forecast hot cereal sales in a major US retailer for Q1 of the upcoming year. The study was conducted during Q4 of the prior year in order to make the predictions.

There were several new product skus being introduced and there were questions around how the skus would perform and which products would capture market share.

A depiction of what we were trying to predict appears below. The circle represents total Hot Cereal Sales in Q1 at the major US retailer.



### Q1 MAJOR US RETAILER \$SALES

If we had a magical crystal ball our measures would completely overlap with future in-market sales. Obviously, that is an unrealistic expectation, however our multi-billion dollar industry has not given up trying. We strive to get closer and closer to those crystal ball predictions as possible.

The results from both phases of the research were telling. The addition of true implicit emotional association measures is bringing us a lot closer to crystal ball level predictions by adding a touch of what might at first seem like magic. But, upon closer inspection, it turns out that the true implicit measures are simply quantifying the impact of decision drivers that consumers are simply unable or are unwilling to tell us.

In phase one we designed a choice based conjoint study, manipulating branded product and price of 10 hot cereal options. We used the data from the choice exercise to derive the explicit preference for each product. In addition, we measured the implicit emotional associations with each product using *Sentient Prime™* implicit research technology. After the study was over and we had made our predictions of which products would be the most successful, we obtained the actual sales data for each product in the following quarter.

### We found clear answers to each of our research questions:

- First, derived conscious preference measures accurately predicted sales, with an  $r=.69$ , accounting for 41% of actual in-market sales data.

*Continued on the following page...*

- Second, automatic emotional associations were correlated with sales data and were more accurate than derived conscious preference, with an  $r=.79$ , accounting for 51% of actual in-market sales data. If you had to pick just one of these measures to forecast oatmeal sales – you’d pick the implicit emotional measures.
- Third, and perhaps most importantly, as you can see below, the implicit emotional measures and the derived conscious preference measures do not overlap by very much. This means they are accounting for different variance in the behavior of interest (millions of dollars of oatmeal purchasing in this case). This indicates that they are ripe to be combined into a single predictive algorithm. When we combine those measures, the correlation with sales increases to  $r=.90$ , accounting for 80% of actual in-market sales. It is important to note that this is not a retro fitted data model, these predictions were made in Q4 and sales measures were from the subsequent Q1

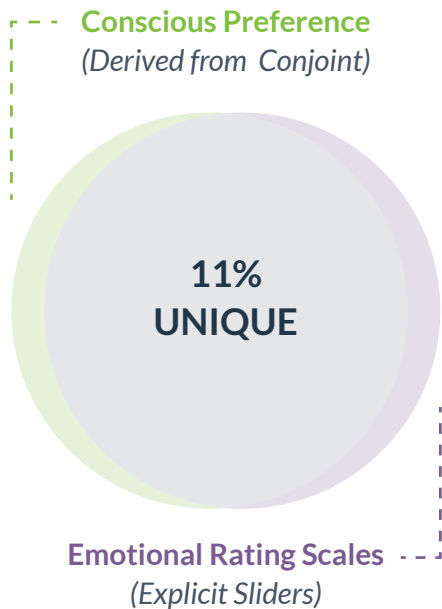
All of these findings were consistent with what we expected. But we were eager find out more. When creating models of future market sales behavior, we are looking for unique predictors. We already know that derived preference measures, from methods like conjoint and max-diff, are better predictors than stated likelihood to purchase measures. However, the question remains: *what other measures can be added to a predictive model that will account for unique factors influencing behavior?* As we saw in phase I, true implicit emotional associations are explaining unique aspects of the sales data, but are there other, less rigorous emotion measurement methods, that might perform just as well as true implicit association measures? How about slow explicit emotional ratings using slider scales? Or “fast explicit” emotional measures?



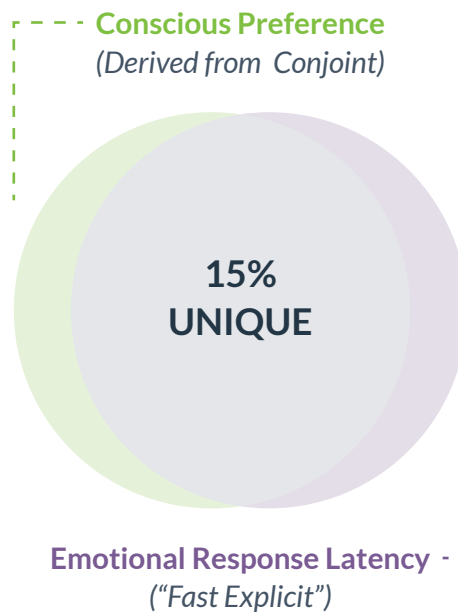
To answer these questions the second phase of the research was conducted using the same products and including the additional conscious emotional evaluation measures. We replicated the conjoint study, included the *Sentient Prime*<sup>TM</sup> implicit emotional association measures, and added explicit emotional slider scales and a “fast explicit” emotional assessment technique that requires an explicit judgment to be made in under one second and records the response latency in milliseconds.

To assess the uniqueness of each measure we ran correlations of each of the three emotional measures with the derived preference measure from the conjoint study and calculated an r-square value. An r-square of 100% would indicate that the measures completely overlap and are not at all unique. We subtracted the calculated r-square value from one hundred to produce the percentage of variance in each measure that is unique from derived preference. The results were telling.

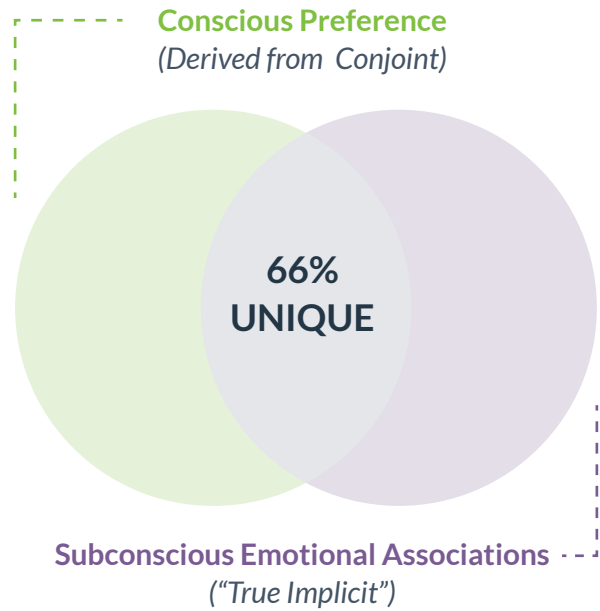
- Explicit emotional slider rating scales were only 11% unique from derived preference measures.



- Fast explicit emotional measures, based on response latencies within a restricted response window, were slightly better at 15% uniqueness from derived preference measures. This means that adding “fast explicit” emotional measures to your research will provide you with data that is at least somewhat unique from what you will derive from choice based conjoint data.



- However, truly implicit emotional associations were 66% unique from derived preference measures. These results indicate that truly implicit measures are far superior at capturing unique elements of the consumer decision-making process, as compared to “slow explicit”, or “fast explicit” measures. As we saw in phase 1 of the research, adding these true implicit emotional association measures to sales forecasting models accounts for a much larger portion of actual in-market sales.



# Best Use Cases for Different Implicit Research Techniques

With this evidence on the importance of using truly implicit research techniques established, the next step is to identify the best use cases for truly implicit techniques and highlight when and why each technique adds unique value. The following table provides a summary of some of the best applications of different implicit techniques.

|   | Brand | Product | Package | Concept | Ad Diagnostics | Ad Impact |
|---|-------|---------|---------|---------|----------------|-----------|
| Implicit Associations<br>(e.g. <i>Sentient Prime™</i> ) | ✓     | ✓       | ✓       | ✓       |                | ✓         |
| Biomeasures (SCR,<br>Heart Rate, Respiration)           |       | ✓       | ✓       |         | ✓              |           |
| Neuromasures<br>(fMRI, EEG)                             |       | ✓       | ✓       |         | ✓              |           |



## Implicit Associations

(e.g., *Sentient Prime™*, *Implicit Association Test*,  
*Affect Misattribution Procedure*)

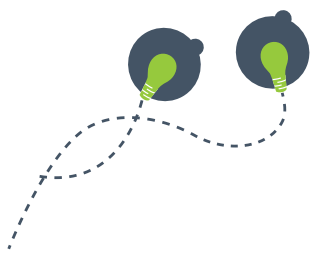
Implicit associations are the most easily scalable and representative of all implicit research techniques. Furthermore, these techniques are easily combined with other advanced conscious assessment techniques. Given that the data is quantitative and measured at the individual participant level, combined conscious and subconscious predictive models are naturally created to provide the most holistic insight on the drivers of behavior.

Implicit associations are exceptional at measuring the subconscious processing of brands, products, packaging and concepts. These measures, combined with conscious assessment measures, will provide a more accurate prediction of what will be successful in the market. But beyond providing accurate predictions, implicit associations go deeper than any other implicit technique to provide insight on **why** a brand, product, package or concept will be successful.



Implicit association techniques reveal the discrete emotional associations that biometric and neuro measures cannot, so managers can distinguish between consumer feelings such as pride versus excitement versus satisfaction. These distinctions are critical for product and brand positioning in the marketplace. Beyond emotions, implicit association techniques provide insight on the cognitive attribute associations that give rise to emotion, arming marketers with even deeper insight on how to evoke emotions in consumers and drive marketplace behavior.

Implicit associations are good at measuring the *impact* of advertising but are not as strong as biometrics or neuro measures in diagnosing the specific elements of an ad. Implicit associations do not have the same temporal resolution as biometrics and neuro measures, and thus when conducting advertising testing, implicit association measures should be combined with bio or neuro measures as an “ad impact” variable.



## Biometrics

(e.g., *skin conductance, heart rate and respiration*)

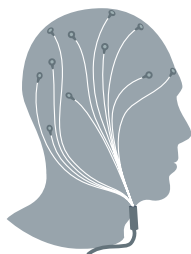
Biometrics and are also strong implicit research techniques but are more difficult to scale globally, and also can suffer from representativeness issues. When designing a biometric based study, be sure that the participants are representative of your population of interest, otherwise your results may not project well to market behavior.

The best application for biometrics is advertising diagnostics, or more broadly, media evaluation. The strength of

biometrics in this domain is the ability to track emotional response in real-time across the time course of an advertisement or other dynamic media content. While biometrics are great at measuring in-time response, they do not directly measure the impact of that response. For this reason, combining biometrics with implicit association measures, and other conscious measures, is the best research solution for holistic insights on the effectiveness of media content.

Biometrics are also well applied to product and package testing because they can capture physiological response to visual or physical exposure to these items. These measures provide an assessment of the physiological response to new or existing

products, or new or existing packaging and certain packaging elements. However, just as with media evaluation, biometrics cannot distinguish well between different kinds of emotions consumers are experiencing.



## Neuro Measures (e.g., EEG and fMRI)

Neuro measures fit the criteria of being implicit measures but are even more difficult to scale globally than biometrics, and just like biometrics, can suffer from representativeness issues. Use extra caution when designing an EEG or fMRI study to ensure that your participants represent your population of interest. There is a natural bias when viewing brain scans to believe that what you're looking at is "truth" because it is brain based data. However, if you have the wrong population in your study, or if your study is not well designed experimentally, the brain data from that study is just as bad as the data coming out of any poorly designed, nonrepresentative conscious research.

Neuro measures are particularly well applied to advertising testing and other media content evaluation. These measures

provide a specificity of response in real-time that is far superior to implicit association methods, and also superior to many biometrics (which possess a greater lag between stimulus and observed response). fMRI has traditionally held a significant advantage over EEG in terms of specifying the subcortical areas of the brain that are processing information (called "spatial resolution"), however, recent advances in source localization algorithms for EEG have begun to close that gap between fMRI and EEG methods. In addition, EEG possesses greater precision in measuring the moment by moment reaction (called "temporal resolution") over fMRI because it is measuring electrical activity rather than changes due to blood flow. For these reasons, plus the lower expense and greater scalability, EEG is currently more practical for market research practice.

Neuro measures are also well applied for product and package testing to provide insight on how these items are being processed. Given the small sample size of neuro and bio measure studies, it is more difficult to reliably pair these results with traditional quantitative conscious measures. Running a concurrent implicit association study, with advanced conscious measures included, on a larger representative sample is a way to capitalize on the unique advantages of each method.

## Two Key Complementary “Passive Observation” Measures

There are several measures techniques that are currently being categorized as neuromarketing techniques, which provide great insight through passive observation, but are not truly implicit techniques. This distinction is important as these measures offer a great complement to truly implicit techniques. The two following passive observation techniques should be commonly used in combination with implicit techniques to add insight to your research results.

**FACIAL CODING** is the measurement and coding of facial expressions to reveal the emotional response of individuals while processing content. This technique is passive, in the sense that it is gleaning insight through observation, but facial expressions in response to content are controllable if respondents are motivated and therefore do not qualify as implicit. This

however, does not mean that they are not extremely useful. As a measure of real-time emotional reaction, facial coding offers a globally scalable technique for advertising diagnosis that can be easily and profitably combined with implicit associations and derived preference measures. Together this combination can deliver moment-by-moment emotional reaction insight as well as advertising impact insight.

**EYE-TRACKING** is a passive measure of attention. Advances in technology offer highly unobtrusive methods for measuring attention engagement of consumers while they process products, packaging, concepts, advertising, in-store environments and more. Eye-tracking data provides insight on what stimuli are capturing attention and for how long. In addition, time course analysis of eye-tracking data provides insight on the communication hierarchy of an environment, product, package, media content etc. The communication hierarchy is very useful in understanding the order in which consumers are processing the persuasive “argument” that your content is making. While extremely useful, consumers are largely able to control where they spend their time looking and the order in which they attend to items, and therefore eye-tracking is not an implicit technique. However, it is an extremely valuable passive observation technique that is profitably combined with implicit measures to provide additional insight on what is producing emotional responses in consumers.

# In Summary

## TO THE THINKER IN ALL OF US

We know we need accurate evidence to support our arguments in business. We know we need deeper explanations of the behaviors we're trying to predict. And we know that evidence based explanations of behavior are most persuasive when woven into a compelling story. Including truly implicit measures as standard components of your research studies will give you evidence and deeper explanations of behavior while providing the fodder for compelling storytelling.

As we get deeper with our scientific approaches to understanding the drivers of behavior, it's probably good to remember that behavioral scientists weren't the first to tackle the issues of the subconscious. In fact, the philosophers and poets have been at this for some time now, and were among the first to gain insight on the power of the subconscious and eloquently express that insight for our delight. And so we finish where we began, with Frost offering his wisdom on how instinct interacts with reason to determine decisions.

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*The last step taken found your heft,  
Decidedly upon the left.  
One more would throw you on the right,  
Another still—you see your plight.*

*You call this thinking, but it's walking.  
Not even that, it's only rocking,  
Or weaving like a stabled horse:  
From force to matter and back to force,  
From form to content and back to form,  
From norm to crazy and back to norm,  
From bound to free and back to bound,  
From sound to sense and back to sound.*

...

*Suppose you've no direction in you,  
I don't see but you must continue  
To use the gift you do possess,  
And sway with reason more or less.*

...

*So if you find you must repent  
From side to side in argument,  
At least don't use your mind too hard,  
But trust my instinct – I'm a bard.*

~Excerpts from "To a Thinker", Robert Frost

## ABOUT THE AUTHOR

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**Aaron A. Reid, Ph.D.**  
Chief Behavioral Scientist  
Sentient Decision Science, Inc.

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As an entrepreneurial consumer psychologist, Dr. Reid founded Sentient Decision Science, Inc. to bring the visionary advances from the behavioral sciences to business in a practical and accessible format. Sentient is a leading behavioral science based research and consulting firm providing best-in-class implicit research technology, applied behavioral economics and marketing science based brand consulting to optimize product, pricing and promotion development and emotionally differentiate brands through strategic positioning and communications.

Dr. Reid is an expert in how emotion influences choice and the subconscious drivers of behavior. His publications include mathematical models of consumer irrationalities in top peer-reviewed psychology journals, such as the Journal of Experimental Psychology and the Journal of Behavioral Decision Making as well as industry leading recognition

More writing by **Dr. Reid** on how behavioral science principles are applied to real world behavior can be found on:

from ESOMAR. His landmark publication of “Emotion as a Tradeable Quantity” was the first to quantify how emotion influences choice as a behavioral weighting mechanism.

Under Dr. Reid’s direction, Sentient Decision Science has developed patent-pending, cloud based, globally scalable implicit research technology that quantifies consumer emotions and neural network associations with brands, products, packaging and advertising. This technology was recognized with the EXPLOR award in 2011 as the most impactful application of technology in market research. By quantifying these gut-feelings, and integrating with rational trade-offs in a single unifying choice algorithm, consumer behavior predictions are significantly more accurate.

Since 2007, the Sentient Consumer Subconscious Research Lab, has been a pioneering R&D force in the development of advanced implicit research methods, most recently demonstrating the unique neural signature of implicit self-identification with brands. The lab houses state-of-the art eye-tracking, EEG biometric and implicit affective priming technology.

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To learn more about how emotion is quantifiable and interacts with reason to determine consumer choice, download our white paper Emotion and Rationality.



The image shows a white paper cover on the left and a dark blue background with a dashed white circle on the right. The white paper cover has the title "You are in the cookie aisle at the grocery store..." and a diagram with icons for a shopping cart, a scale, a heart, and a brain. The dark blue background has the text "Download our white paper on Consumer Emotion & Rationality" and a green "DOWNLOAD NOW" button.

*It's getting hot in here. The Impact of Hot-States on Decision-Making*

**You are in the cookie aisle at the grocery store...**

Like any responsible health-conscious individual, you are watching your weight and nutrition. You are only in the cookie aisle anyway because you are on your... Suddenly,

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