

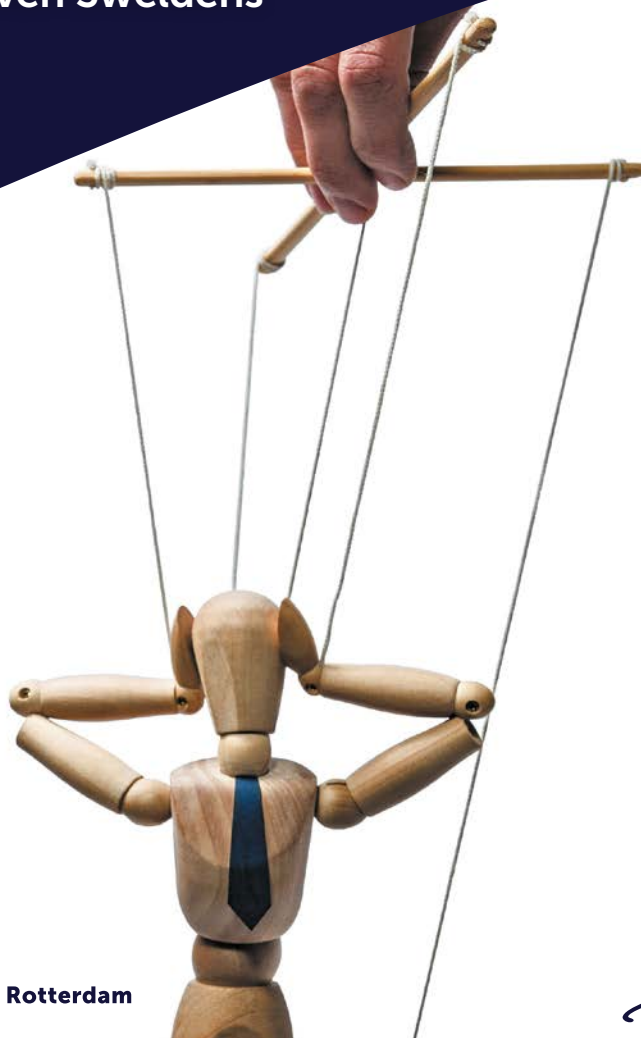
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Puppets on a String

Studying Conscious and Unconscious Processes in Consumer Research

Prof.dr. Steven Sweldens



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Studying Conscious and Unconscious
Processes in Consumer Research

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Prof.dr. Steven Sweldens

Address delivered at the occasion of accepting the appointment as Endowed Professor of Consumer Behavior and Marketing, on behalf of the Erasmus Trustfonds, Erasmus University Rotterdam, at the Rotterdam School of Management, Erasmus University Rotterdam on Friday 18 May 2018.

Rotterdam School of Management
Erasmus University Rotterdam
P.O. Box 1738
3000 DR Rotterdam
E-mail: sweldens@rsm.nl
<https://www.rsm.nl/people/steven-sweldens/>

Puppets on a String

Studying Conscious and Unconscious Processes in Consumer Research

Abstract

For more than a century, scholars in psychology have debated whether humans are 'of two minds,' that is, whether they have both conscious and unconscious thoughts, and whether both conscious and unconscious thought processes determine their behavior. According to Freud's iceberg model, conscious thought is just the tip of the iceberg, with most of our thought processes taking place unconsciously. Marketing scholars and practitioners have embraced the iceberg model with great enthusiasm. They have incorporated models where people's drives and motivations are built in layers, with only the top layer consciously accessible, but the real drivers hidden underneath. According to one of the most influential contemporary theories, human thinking is governed by dual systems. System 1, it is argued, is the evolutionarily oldest system, based in parts of the brain we share with lower animals, operates unconsciously, uncontrollably, with low effort, has huge capacity, is fast, nonverbal, parallel, and associative. System 2, conversely, is evolutionarily more recent, resides in our frontal cortex, operates consciously, controllably, with high effort, has small capacity, is slow, verbal, serial, and based on rules.

Despite their intuitive appeal, dual system theories have been challenged in recent years. I discuss some of their more problematic aspects and the research I have conducted testing core propositions of the dual system approach. Especially my research on the way brands become more well-liked through advertising and conditioning procedures is highly relevant for the debate, but so is research on people's risk perceptions and self-control performance. Overall, I have seen support for **some** of the key predictions of dual process theory, but no support at all for its strong claim that mental processes should clearly belong to one of two systems with highly separable features. I argue that we need to acknowledge that the human mind cannot be neatly divided into two complementary processing systems. Rather, we should recognize that thought processes can be characterized to a greater or lesser extent by some but not all the features of automaticity. Researchers should start recognizing the full complexity of the human mind and embrace research that is more detailed, more precise – and perhaps a bit less grand in its claims.

Puppets on a String

Studying Conscious and Unconscious Processes in Consumer Research

Samenvatting

Gedurende meer dan een eeuw hebben onderzoekers in de psychologie bediscussieerd of de menselijke geest uit twee delen bestaat, of ze zowel bewuste als onbewuste gedachten hebben, en of zowel bewuste als onbewuste gedachten ons gedrag bepalen. Volgens Freuds ijsberg-metafoor is het bewuste slechts de top van de ijsberg, en vinden de meeste van onze gedachten plaats in het onbewuste. Marketing onderzoekers en beoefenaars in de praktijk hebben het ijsberg-model met veel enthousiasme omarmd. Ze incorporeerden modellen waarin de menselijke drijfveren en motivaties opgebouwd zijn uit lagen, en enkel de bovenste laag bewust toegankelijk is, maar de 'eigenlijke drijfveren' onderin verborgen liggen. Volgens een van de meest invloedrijke moderne theorieën wordt het menselijke denken bepaald door twee systemen. Volgens die theorie zou Systeem 1 het evolutionair oudste systeem zijn, gebaseerd in delen van het brein die we delen met lagere diersoorten, en opereert het onbewust, automatisch, met weinig inspanning, enorme capaciteit, snel, non-verbaal, parallel en associatief. Systeem 2, aan de andere kant, is evolutionair meer recent, resideert in onze frontale cortex, opereert bewust, gecontroleerd, vereist inspanning, met lage capaciteit, traag, verbaal, serieel, en op basis van regels.

Ondanks hun intuïtieve aantrekkingskracht zijn dubbele systeemtheorieën recent bekritiseerd. Ik licht sommige van hun meer problematische aspecten toe, en belicht het onderzoek dat ik heb uitgevoerd waarin ik centrale proposities van de dubbele systeemtheorieën heb onderzocht. Met name mijn onderzoek over de manier waarop merken beter gewaardeerd worden dankzij advertenties en conditioneringsprocedures is zeer relevant voor het debat, evenals onderzoek over menselijke risico-percepties en zelfcontrole. Samenvattend heb ik ondersteunende evidentie gezien voor **sommige** voorspellingen van de dubbele systeemtheorieën, maar heb ik tegelijkertijd **nooit** evidentie gevonden voor hun sterkste voorspelling: dat mentale processen duidelijk zouden behoren tot een van twee systemen, met duidelijk te onderscheiden eigenschappen. Ik argumenteer dat we moeten aanvaarden dat de menselijke geest niet netjes in twee complementaire systemen verdeeld kan worden. Integendeel, we moeten erkennen dat mentale processen in meer of mindere mate gekarakteriseerd kunnen zijn door sommige, maar niet alle eigenschappen van automaticiteit. Onderzoekers moeten de complexiteit van de menselijke geest meer ten volle erkennen, en onderzoek omarmen dat gedetailleerder, preciezer, en waarschijnlijk ook een beetje minder groots is in zijn uitspraken.

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1. Introduction

**Dear Rector Magnificus of the Erasmus University,
Dear Board Members of the Vereniging Trustfonds,
Dear Dean of the Rotterdam School of Management,
Dear family, friends, colleagues, and students,
Dear distinguished guests,**

It is an honor and a privilege to accept the appointment of Endowed Professor of Consumer Behavior and Marketing at Erasmus University by means of this inaugural address, entitled "Puppets on a String? Studying Conscious and Unconscious Processes in Consumer Research."

We all know the image of the master puppeteer controlling his marionettes, determining their movement via nearly invisible threads. Puppets are often seen as tragic creatures, unable to determine their own destiny, controlled by forces, the existence of which they can barely imagine. The idea of the puppet looking to control its own destiny has appealed to the popular imagination for centuries. When Carlo Collodi wrote his novel "The Adventures of Pinocchio" in 1881, it was a smash hit and considered one of the most modern and important works of the 19th century, and it's still one of the most famous and iconic children's stories to date. The story of puppets trying to control their destiny continues to resonate with children and adults today – witness the success of the Toy Story movies. Beneath this fascination lies a fear that we too, like those hapless puppets, might be controlled by forces we don't understand – or even know about.

But how are puppets connected to us? And, how are they related to Consumer Behavior and Marketing, the chair I am accepting today and the supposed topic of this address? To explain, I first need to tell you a bit about the history of our field, and how I found my place in it. Buckle up, but relax, here we go.

Consumer Behavior is an academic subfield in the field of Marketing, studying all the activities associated with the purchase, use, and disposal of goods and services, including the consumer's emotional, mental, and behavioral responses that precede or follow these activities. It is an interdisciplinary field, grounded largely in the discipline of psychology, while drawing extensively on sociology, anthropology, ethnography, marketing, and economics, especially behavioral economics. Put simply, it examines how emotions, attitudes, and preferences affect consumption behavior.

Due to its grounding in psychology, theories in the mother discipline have always been highly influential for what we believe about consumer behavior. For more than a century, scholars in psychology have debated whether humans are of two minds, that is, whether we have both conscious and unconscious thoughts, and whether both conscious and unconscious thought processes determine our behavior. According to some early psychologists, most famously Sigmund Freud, humans are at the mercy of

unconscious forces, shaped largely by what happened in their childhood and by the things that are repressed from consciousness. Freud's view can best be summarized with the iceberg metaphor: our conscious experiences and thoughts are just the tip of the iceberg. While we are fully aware of what is going on in the conscious mind, we have no idea of what information is stored in the unconscious mind. According to Freud, we are very skilled at suppressing unwanted thoughts that might threaten our precious egos to the unconscious.

In many ways, marketing scholars and practitioners have embraced the iceberg model with great enthusiasm. They have incorporated models where people's drives and motivations are built in layers, with only the top layer consciously accessible and the real drivers hidden underneath. They have built great interviewing and implicit measurement techniques to discern those real, but unconscious drivers of behavior. People don't buy low-fat yoghurt because they want to consume fewer calories, and perhaps not even because they want to be healthy. Dig deep enough, and you'll discover they do it because they want to be attractive. Dig a bit further, and you'll discover why they want to be attractive. And if you dig deep enough, invariably you'll come to the same conclusion Freud reached 100 years ago – it's all because of sex. Clearly, realizing the true drivers of human behavior is quintessential for success in marketing. By understanding better why people buy your products, you'll be able to market them better and make sure they appeal more to your target consumers.

Of course, psychology has advanced since those early days. Modern notions of the unconscious regard it as much more 'adaptive'^{1,2}. Rather than being the incubation ground for everything that traumatized us as kids, or the container of anything that threatens our egos, the unconscious mind is now seen as a parallel system that can process vast amounts of information with incredible efficiency. Scholars have argued that humans process most information unthinkingly, often acting on it automatically, in what some scholars have even called a "perception-behavior express-way"³. We see, we do, without thinking consciously, like puppets on the strings of unconscious and environmental forces. Experiments have shown that just reading words referring to the elderly will make you walk more slowly⁴ – and become more forgetful too⁵. Studies in marketing have shown that just seeing an Apple logo will make you think more creatively⁶.

- 1 Wilson, T. D. **Strangers to ourselves**. (Harvard University Press, 2004).
- 2 Hassin, R. R., Uleman, J. S. & Bargh, J. A. **The New Unconscious**. Oxford Series in Social Cognition and Social Neuroscience. (2005).
- 3 Dijksterhuis, A. and J. A. Bargh (2001). The perception-behavior expressway: Automatic effects of social perception on social behavior. **Advances in Experimental Social Psychology**, **33**: 1-40.
- 4 Bargh, J. A., Chen, M. & Burrows, L. Automaticity of social behavior: Direct effects of trait construct and stereotype activation on action. **Journal of Personality and Social Psychology** **71**, 230-244 (1996).
- 5 Dijksterhuis, A., Bargh, J. A. & Miedema, J. in **Subjective experience in social cognition and behavior** (eds Herbert Bless & Joseph P. Forgas) (Psychology Press, 2000).
- 6 Fitzsimons, G. M., Chartrand, T. L. & Fitzsimons, G. J. Automatic Effects of Brand Exposure on Motivated Behavior: How Apple Makes You "Think Different". **Journal of Consumer Research** **35**, 21-35 (2008).

Some research even demonstrates that people make better decisions if they don't think consciously about a complex problem. So simply divert your attention away from the problem at hand, let your unconscious thinking do the rest, and you'll get better results than if you had really thought about it⁷. Finally, one of the most intriguing research findings demonstrated that just seeing a professor will make you better at Trivial Pursuit⁸. Now that's convenient, we simply need to don our robes, appear in front of you, and you'll get smarter just like that. Thanks to the power of the unconscious, we don't even have to teach!

At the same time, we clearly need to recognize that humans can excel at conscious, rational thinking too – witness the triumphs of science and culture. How can we reconcile the fact that humans are both capable of developing the greatest rational, linguistic, and scientific feats, and at the same time are unconsciously influenced by the simplest of stimuli in the environment? When I started my career in academia 14 years ago, many people in the field had embraced a 'dual processes' sort of solution. Dating back to the 1970s⁹, the dual process theory was elegant, powerful, and ostensibly solidly grounded in biology and evolution. The solution to the conundrum seemed simple. Humans were simply **both**. We are both rational and emotional, we are both analytical and intuitive, we can reason both quickly and slowly, and we can think consciously and unconsciously. Daniel Kahneman, who won the Nobel prize in Economics in 2002 – and received an honorary doctorate from Erasmus University on this very stage in 2009 (clearly the more impressive achievement), wrote an extremely influential book entitled "Thinking Fast and Slow," popularizing the case for two systems of reasoning that had been built on top of each other over millions of years of evolution¹⁰. System 1, it is argued, is the evolutionarily oldest system, based in parts of the brain we share with lower animals, operates unconsciously, uncontrollably, with low effort, has huge capacity, is fast, nonverbal, parallel, and associative. System 2, conversely, is evolutionarily more recent, resides in our frontal cortex, operates consciously, controllably, with high effort, has small capacity, is slow, verbal, serial, and based on rules. If it wasn't for our precious, rational, frontal-lobe based System 2, we would be at the mercy of System 1's deeper, unconsciously operating forces.

- 7 Dijksterhuis, A. Think different: The merits of unconscious thought in preference development and decision making. *Journal of Personality and Social Psychology* **87**, 586-598 (2004).
- 8 Dijksterhuis, A. & van Knippenberg, A. The relation between perception and behavior, or how to win a game of trivial pursuit. *Journal of Personality and Social Psychology* **74**, 865-877 (1998).
- 9 Posner, M. I. & Snyder, C. R. R. in *Information processing and cognition: The Loyola Symposium* (ed R. L. Solso) 55-85 (Erlbaum, 1975).
- 10 Kahneman, D. *Thinking, fast and slow*. (Macmillan, 2011).

2. Problems with the Dual Process Framework

The 'dual process theory' was so powerful because it could ostensibly explain almost everything we knew about human behavior. However, you might be surprised to hear that explaining too much can be a problem for scientific theories, especially if it compromises their ability to be falsified. Scientific theories, after all, can never be conclusively proven – they can only be consistent with the evidence until they turn out to be inconsistent (falsified), and an update to the theory or a completely new theory is necessary. Dual process theory struggles with this possibility of falsification: whatever behavioral or decision-making outcome we observe, it can easily be explained by invoking either of the two Systems. Unsatisfied with this state of affairs, several behavioral scientists have been critically wondering whether this dual process theory is really as valid and useful as we initially assumed^{11,12}. Their skepticism was reinforced after it emerged that many of the most prominent and 'sexy' research findings underlying the case for an 'automatic' or 'primitive' processing system determining behavior (System 1) were proven to be unreliable and could not be replicated. Seeing the elderly is not enough to make you walk more slowly after all¹³. Sadly, I also need to report that just seeing a professor is not enough to make you smarter either – you still have to listen to what she says;¹⁴. Oh, and please don't believe that you'll make better decisions about complex problems by not thinking about them either. For over a year, I have tried unsuccessfully to replicate any such finding, and I was not alone¹⁵. However, in my opinion, the most important critiques have focused on two areas.

First, researchers have pointed out that some commonly held assumptions about the foundations of System 1 are based on very limited empirical support. Most notably the idea of an unconscious learning system that processes co-occurrences in our environment without our awareness of its operation has proven highly elusive¹¹. Together with Mirjam Tuk and Mandy Hütter, I recently wrote a commentary in the *Journal of Consumer Research* in which we outline the implications of these problems for consumer researchers¹⁶. We argue that researchers have often been far too quick to jump to the conclusion that a phenomenon has its roots in unconscious processes. They tried to measure whether participants were aware of what drove their behavior,

- 11 Mitchell, C. J., De Houwer, J. & Lovibond, P. F. The propositional nature of human associative learning. *Behavioral and Brain Sciences* **32**, 183-198 (2009).
- 12 Shanks, D. R. Learning: From association to action. *Annual Review of Psychology* **61**, 273-301 (2010).
- 13 Doyen, S., Klein, O., Pichon, C.-L. & Cleeremans, A. Behavioral Priming: It's All in the Mind, but Whose Mind? *PLoS One* **7**, e29081 (2012).
- 14 O'Donnell, M. et al. Registered Replication Report: Dijksterhuis and van Knippenberg (1998). *Perspectives on Psychological Science* **13**, 268-294 (2018).
- 15 Nieuwenstein, M. R. et al. On making the right choice: A meta-analysis and large-scale replication attempt of the unconscious thought advantage. *Judgment and Decision Making* **10**, 1-17 (2015).
- 16 Sweldens, S., Tuk, M. A. & Hütter, M. How to study consciousness in consumer research, A commentary on Williams and Poehlman. *Journal of Consumer Research* **44**, 266-275, doi:10.1093/jcr/ucx044 (2017).

but their measurements were simply not very sensitive or close enough in time to when the learning took place, so it was 'easy' to generate evidence for unconscious effects. If your empirical definition of a process is defined as the negative (i.e., absence) of what you can measure, you must make sure your measurement is as perfect as possible. Put differently, if you don't measure what happens consciously perfectly, it will **seem** as if a lot of what happened occurred unconsciously.

A second major line of criticism on the dual process theory is that dividing processes into two neat categories is a gross oversimplification of reality. Also known as the **alignment problem**, researchers argue there is simply no convincing evidence that the features of System 1 or System 2 necessarily co-occur, and a lot of evidence that often they do not¹⁷. In other words, there is no guarantee that if a process occurs without awareness, that it is also unintentional (in that people can't start it willingly), uncontrollable (in that people can't stop it or change its output if they want to), or efficient (in that it doesn't require many processing resources). In fact, there's a lot of evidence for processes that are characterized by some features but not by others. Our use of language serves as a good example. People are unaware of how they combine sounds into words or which rules they follow to create grammatical sentences in their native language, but using language is still an intentional act, which can be stopped or controlled at any time. The same goes for skills like typing or driving.

Most of the research I have done in the past 14 years was inspired by aspects of dual process theory. I have consistently tried to pry open this black box we call our brain through controlled, experimental research. I have investigated whether the assumption that we have two processing systems is warranted. In what follows, I will tell you about some of my findings, and about what I would like to do next. I will first focus on the research that defined my career: investigating how advertising makes us like new products and brands.

17 Melnikoff, D. E. & Bargh, J. A. The Mythical Number Two. *Trends in Cognitive Sciences* **22**, 280-293 (2018).

3. The Role of Evaluative Conditioning in Advertising

What put me on the map as a scholar in consumer behavior and marketing – indeed the chair I am accepting today – is my research on how advertising works psychologically. To clarify, I wouldn't want to claim to have studied all forms of advertising. My research focuses on advertising of this kind [image of Coke with ice bears], or this kind [image of Pepsi with Britney or Beyoncé], or if you prefer a Dutch national icon, this kind [image of Samsung with Doutzen Kroes]. More generally, I study the type of advertising that makes you like a brand simply by presenting it with other stimuli you already like. These other stimuli can be celebrities, beautiful pictures, music, basically anything, as long as it puts a smile on your face. Note that in this type of advertising, these images tell you very little about product quality, let alone price. All they do is trigger a feeling of liking. Apparently, marketers assume that somehow this liking will transfer from the positive stimulus to their brand.

Their assumption is supported by the fact that this type of advertising has been successfully applied for more than a hundred years [witness this first ad for Coca-Cola from 1895 featuring supermodel Hilda Clark]. It is also evident from the fact that the scientific underpinnings of this effect have been well-established in hundreds of research papers, collectively referred to as the domain of evaluative conditioning¹⁸. So, what is evaluative conditioning?

Evaluative conditioning (EC) is the name for an effect¹⁹. This effect is the observed change in liking in one stimulus (often neutral, called the conditioned stimulus) following its repeated pairing with another stimulus (often valenced, called the unconditioned stimulus). In marketing, the conditioned stimulus is typically a brand name, and the unconditioned stimulus (or stimuli) is the positively valenced stimuli used by marketers to change brand liking (e.g., celebrity endorsers, beautiful scenes, music).

Note that this is a very passive effect: people don't need to **do** anything, no behavior needs to be reinforced, simply observing these co-occurrences of stimuli is enough to change their attitudes.

18 Hofmann, W., De Houwer, J., Perugini, M., Baeyens, F. & Crombez, G. Evaluative conditioning in humans: A meta-analysis. *Psychological Bulletin* **136**, 390-421 (2010).

19 De Houwer, J. A Conceptual and Theoretical Analysis of Evaluative Conditioning. *Spanish Journal of Psychology* **10**, 230-241 (2007).

4. The Role of Evaluative Conditioning in Testing System 1

There are several reasons why it is interesting to use EC to test the dual process theory, and more specifically, to test the potential abilities and existence of System 1. It deals primarily with emotions and does not require language. It is associative as the effect is just built up by repeated presentations of these stimuli. Marketers have often assumed it would work best if consumers don't reason too much about it. It should therefore come as no surprise that researchers have often studied EC effects as a litmus test of the abilities of System 1. Some of the crucial questions they have investigated include: Can EC effects emerge without people's awareness of the co-occurrences between these stimuli? Can EC effects be uncontrollable? If these questions cannot be answered with an unqualified "yes," then this would yield serious concerns about the entire existence of our System 1. After all, if these crucial operating conditions (unconscious, uncontrollable) cannot convincingly be demonstrated in the one domain where System 1 is assumed to operate most strongly (emotional, associative effects), it poses very serious question marks on the need to posit a System 1 in the first place. It is precisely in these two domains that I believe to have made some important contributions.

5. Can Evaluative Conditioning Effects Occur Unconsciously?

One of the key questions in this field is whether EC effects can occur unconsciously. Put differently, can brands become more well-liked, without people being aware that the brand was presented with positive affective stimuli in the first place? I wrote about the history of this debate together with Olivier Corneille from the Université Catholique de Louvain. I am honored Olivier could join us here today²⁰. To give you an idea, of the 372 articles mentioning “evaluative conditioning” in their topic of investigation, 189 also mention “awareness,” indicating that about 50% of the research on this topic has attached significant importance to the question of whether this effect occurs unconsciously (Web of Science, March 28, 2018). With such a battery of scientific research attention, surely the question must have been solved? Unfortunately, not. For every article claiming that EC effects can be obtained unconsciously, another was published disputing that conclusion, and this has been happening for more than three decades.

Much of the disagreement can be attributed to the fact that accurately measuring awareness is excruciatingly difficult. Why would that be the case? Isn't the question simple enough? All we need to know is whether people who have seen brands paired with positive images come to like these brands better, even if they are unaware of the fact that the brand co-occurred with these images in the first place. The approach seems straightforward enough: take a bunch of new brand names, present half of them with positive images of the Doutzen Kroes kind, the other with neutral, control images that don't make your heart tick faster. Check how much people like the brands afterwards and ask whether they remember which images were presented with the brands. Then check whether people like the brands paired with positive images more than your control brands, **even if they can't remember the image that was paired with the brand**. How difficult could it be? Let me try to illuminate just one of the fundamental obstacles that make this question to vexingly difficult to answer.

The problem starts with the fact that if you ask people what they remember, their responses can be constructed rather than directly extracted from memory. Imagine being exposed to a series of brands, some of which were paired with positive images, some of which were not. Afterwards, we could ask you: was this brand paired with positive images, neutral images, negative images, or don't you remember? Now one possibility is that you remember accurately what type of image was paired with the brand – and respond accordingly. So far so good. However, what happens if people don't really remember? In that case, they could still arrive at the correct response by relying on another source of information: their feelings about the brand.

²⁰ Sweldens, S., Corneille, O. & Yzerbyt, V. The role of awareness in attitude formation through evaluative conditioning. *Personality and Social Psychology Review* **18**, 187-209 (2014).

For example, imagine you really like a certain brand, then wouldn't you infer that this brand must have been presented with positive (rather than negative or neutral) images before? This problem is known as 'the use of feelings as information,' and it is a terrible problem in this research context. Just think about it: whenever the EC procedure 'works' and brand attitudes are improved, this change in feelings or attitudes alone makes it more likely that people will correctly answer the memory questions about the images later. Conversely, when the EC procedure doesn't work, and brand attitudes are not improved, people don't benefit from the advantage of using feelings as information. As a result, it **seems** as if EC effects go hand in hand with memory for the pairings, since whenever brand attitudes are changed, that change improves memory performance, and whenever brand attitudes are not changed, there is no bonus on memory performance.

Although it's not rocket science, I was the first to realize how pernicious the use of feelings as information could be in this domain. It leads to the conclusion that evaluative conditioning effects do not occur without awareness, even if they do. Clearly, I needed to find a method to decouple the effects of memory for the pairings from the influence of using feelings as information. But although I had developed an understanding of the problem, I had no idea how to develop a solution. That's when I happened to come across the doctoral dissertation research by Mandy Hütter, now at the University of Tübingen. I'm most grateful she could also join us here today. Incredulously, Dr. Hütter had developed a new method that could dissociate the effects of memory for the pairings from one's feelings about the stimuli. We decided to join forces, combining my simulations on the previous methods with her new methodology, and submitted the article titled "Dissociating Contingency Awareness and Conditioned Attitudes: Evidence for Contingency-Unaware Evaluative Conditioning" to the highest ranked journal for experimental work in psychology: *Journal of Experimental Psychology: General* (JEP:G). This journal only considers work of the highest empirical quality which must be relevant for multiple subfields in psychology simultaneously. We hoped we would have a chance, precisely because this issue is crucial for the wider debate on dual process theories of learning and the System 1 / System 2 dichotomy.

The paper received a spectacular response: our article was accepted for publication in the first round²¹. Isabel Gauthier, the journal editor, called it "simply the most positive set of first round reviews I have seen". The success of our collaboration did not end there. Mandy Hütter and I next applied her new methodology to investigate one of the core propositions I had made in my own doctoral dissertation research: the thesis that simultaneous (but not sequential) presentations of brands with affective stimuli can automatically charge the brand with positive affect²². Consistent with this proposition, we found that simultaneous (but not sequential) presentations can change brand

- 21 Hütter, M., Sweldens, S., Stahl, C., Unkelbach, C. & Klauer, K. C. Dissociating contingency awareness and conditioned attitudes: Evidence of contingency-unaware evaluative conditioning. *Journal of Experimental Psychology: General* **141**, 539-557 (2012).
- 22 Sweldens, S., van Osselaer, S. M. J. & Janiszewski, C. Evaluative conditioning procedures and the resilience of conditioned brand attitudes. *Journal of Consumer Research* **37**, 473-489 (2010).

attitudes without participants' awareness. The ensuing article was received equally positively and published soon after in JEP:G²³.

So, what are the conclusions from all this research? There is now some support for the existence of an unconsciously operating associative system during learning. At the same time, there are still important caveats. First, our method still measures awareness after the fact, not during the learning process itself. Second, some more recent investigations generated unpredicted results, indicating that the reliability of the method in detecting implicit effects isn't perfect²⁴. Third, independent research that presented stimuli 'subliminally' (too briefly to be consciously perceived, but long enough to be unconsciously perceived) has not found support for a System operating on unconsciously perceived stimuli^{25, 26}. Clearly, the debate is not settled, and more work remains to be done. In future research, I will continue to look for ways to improve the state of our knowledge on this important question.

- 23 Hütter, M. & Sweldens, S. Implicit misattribution of evaluative responses: Contingency-unaware evaluative conditioning requires simultaneous stimulus presentations. **Journal of Experimental Psychology: General** **142**, 638-643 (2013).
- 24 Mierop, A., Hütter, M. & Corneille, O. Resource Availability and Explicit Memory Largely Determine Evaluative Conditioning Effects in a Paradigm Claimed to be Conducive to Implicit Attitude Acquisition. **Social Psychological and Personality Science** **8**, 758-767 (2017).
- 25 Stahl, C., Haaf, J. & Corneille, O. Subliminal evaluative conditioning? Above-chance CS identification may be necessary and insufficient for attitude learning. **Journal of Experimental Psychology: General** **145**, 1107-1131 (2016).
- 26 Högden, F., Hütter, M. & Unkelbach, C. Does evaluative conditioning depend on awareness? Evidence from a continuous flash suppression paradigm. **Journal of Experimental Psychology: Learning, Memory, and Cognition** **forthcoming** (2018).

6. Can Evaluative Conditioning Have Uncontrollable Effects?

Dr. Hütter and I next turned our attention to a second key property of the purported System 1: the idea that it would operate in uncontrollable ways. Note that this question, while theoretically just as important as the previous one, is also of incredible practical importance. Think about it. Advertising techniques based on presenting brands with positive imagery are everywhere. This time we're asking: Can people exert full control over the effect of these advertisements on how they feel about these brands? Another way of putting this would be: suppose you don't want to be influenced by an advertisement, suppose you're fully motivated not to believe it or let it affect you, can you resist the effect?

It might seem strange that such a fundamental question about advertising and conditioning effects has remained unanswered for so long. Again, it is very difficult to answer. After all, there is no doubt people can reason consciously about such ads. Clearly, you can agree or disagree with the content of such advertisements, using the best of your System 2 abilities. For example, you might think "I like Doutzen Kroes, so I like Samsung," but you're equally free to think "I don't like Doutzen Kroes, so I don't like Samsung" or even "do they seriously think I'll buy a Samsung phone just because they display a beautiful face in the ad?" The challenge is to detect whether despite all these conscious considerations, there is a System 1-like network happily wiring Samsung-Doutzen-liking together 'under the hood.' Put differently, we have no doubt that a large part of these advertising effects can be controlled. But is there **also** a part that cannot be controlled?

To answer this question, we needed a method that could dissociate controllable and uncontrollable advertising effects, and that is precisely what we did. By asking some people to go against the effects of such advertising techniques and others to behave normally, we could disentangle how much of the effect can be controlled – and whether there's a part that cannot be controlled. The results indicated that, yes, pairing brands with positive affective stimuli can have uncontrollable effects on consumers' attitudes and consumption decisions. Interestingly, we also demonstrated that the uncontrollable brand conditioning effects are independent of cognitive processing resources (meaning the process is efficient), while the controllable part is dependent on mental capacity. Furthermore, adding financial incentives for people to withstand the effects only affected the controllable part of conditioning effects, but left the uncontrollable component unaffected (meaning the process is independent of motivation or intention). This means that our research did not only find evidence for one crucial assumed characteristic of System 1 – uncontrollability of associative learning – but also found evidence of alignment between the core features of System 1: what is uncontrollable also turned out to be resource efficient and unintentional.

I am happy to report that the summary article entitled “Dissociating Controllable and Uncontrollable Effects of Affective Stimuli on Attitudes and Consumption” has just been published by the *Journal of Consumer Research* – the flagship journal of our discipline²⁷. I also believe that this might be the most important paper I’ve ever published, simply because of its practical implications. The results of our experiments indicate that people are influenced by the most primitive kinds of advertisements in a way they cannot fully control. It gets even worse when you realize that the participants in our experiments were all university students, a population that is assumed to be relatively ‘smart’ and independent in their thinking. If even they behave as “puppets on a string”, imagine the implications for more vulnerable groups in society, such as children, people with below-average IQs, sick people, or those with mental disabilities. All of this raises serious questions about the extent to which such advertising techniques should be condoned by society, or whether they should be better regulated – especially when they target vulnerable groups. In future research, I would love to dig deeper into these kinds of practical questions: Can we study the effects of real ads? How pervasive are the effects on vulnerable groups in society?

27 Hütter, M. & Sweldens, S. Dissociating Controllable and Uncontrollable Effects of Affective Stimuli on Attitudes and Consumption. *Journal of Consumer Research* forthcoming (2018).

7. What About Other Domains of Evidence for System 1?

Of course, EC effects are not the only ones considered as evidence for the existence and operation of System 1. To be honest, in his influential book “Thinking Fast and Slow”, Daniel Kahneman doesn’t even bring up this subject. Instead, he draws on different domains, most notably the existence of biases in our judgments and decision-making that would be caused by the self-focused, quick-thinking System 1. It is often argued that System 1 disproportionately weighs evidence related to the self, at the expense of evidence related to others because it is focused predominately on processing what is right in front of us. This can make us overconfident in our own abilities and chances in life, compared with those of others. Take, for example, our driving skills. When driving, we notice ourselves making rational decisions in traffic all the time (while we don’t observe this of others). But when something goes wrong, another driver is usually present, so it’s very easy to blame what went wrong on that someone else (he drove too fast or wasn’t paying attention). As a result, an astonishing 90% of people believe they are better drivers than average²⁸.

There is no doubt that overoptimism and overconfidence are some of the most pervasive biases in judgment and decision-making. I teach marketing strategy to professionals with multiple years of business experience. During my classes they manage a virtual firm in a simulated environment. Towards the end of the course, I always ask these professionals to predict as accurately as possible (they are graded on this) how profitable their virtual firms will ultimately become. Time and time again, I have found that these experts’ best forecasts are very precise, but also very wrong. With great consistency, they are on average about 150% too optimistic about their performance. But is such overoptimism really caused by the operation of a self-focused, optimism-inducing unconscious processing system?

In research I conducted with my colleagues from Erasmus University, Stefano Puntoni, Gabriele Paolacci, and Maarten Vissers we found a much more prosaic explanation²⁹. In a meta-analysis of the literature, we considered the explanatory power of various possible explanations of the overoptimism bias and found that it could best be explained by simple impression management. It turned out that the most important reason why people seem so unrealistically optimistic, is that they worry about what others would think about them if they did **not** respond optimistically. People don’t state they’re less likely to lose their jobs than other people because deep down they believe they are superior to others. Instead, it turns out that when people make such claims,

28 Svenson, O. Are we all less risky and more skillful than our fellow drivers? *Acta Psychologica* **47**, 143-148 (1981).

29 Sweldens, S., Puntoni, S., Paolacci, G. & Vissers, M. The bias in the bias: Comparative optimism as a function of event social undesirability. *Organizational Behavior and Human Decision Processes* **124**, 229-244 (2014).

they do so mainly out of fear for what it might say about them if they didn't display optimism. Similarly prosaic explanations were offered by those managers in my classes. When I asked them why experienced professionals like themselves could be so incredibly off the mark in their best business forecasts, their responses often indicated that optimism was expected of them. "To be pessimistic is to be suspect – our shareholders and managers would think we aren't ambitious enough and would replace us with people promising better targets." At least for this particular bias, positing an unconscious processing system as explanation does not seem necessary at all.

And yet in other research, again with Stefano Puntoni and with Nader Tavassoli of London Business School, we did find evidence for unconsciously generated biases in risk assessments. In a paper we published in the *Journal of Marketing Research* in 2011, we showed that young women react defensively to the possibility of contracting breast cancer, displaying a "can't happen to me" attitude when it comes to their personal risk assessments³⁰. Interestingly, the more cues relating to femininity present in the environment (or in breast cancer awareness ads), the stronger this tendency to deny their vulnerability became. Apart from learning that using pink to promote breast cancer awareness is really a bad idea (since it activates thoughts of femininity), we also learned that this defensive reaction is an unconscious coping response for fear. When their fear of the disease was brought to the surface, the defensive denial responses disappeared. When their egos were 'affirmed' in other dimensions, that too helped them face the threat. Freud would certainly have approved of these findings, as they are consistent with his ideas of how the ego (our consciousness) protects itself from threatening thoughts by banning them to the unconscious.

The final paper I would like to highlight here is research I've done with Mirjam Tuk of Imperial College London (by far my most important collaborator, who, I'm happy to say, is also present here today), and Kuangjie Zhang of Nanyang Technological University (my first doctoral student). We tested two beliefs about the workings of System 1 and System 2³¹. The first was the belief that System 2 is energy-dependent and draws on a limited pool of mental resources we use for self-control³². We tested this belief in nine experiments and found very limited support for the idea that our mental resources would be limited and quickly depleted in sequential self-control requiring tasks. We also tested whether our mind can multi-task, operate in parallel as predicted by System 1. We based our reasoning on Mirjam's earlier, famous research finding that people who had to urinate urgently also exerted more self-control in other domains, for example, in financial decisions³³. We wondered if that would hold more generally: Would exerting

30 Puntoni, S., Sweldens, S. & Tavassoli, N. T. Gender Identity Salience and Perceived Vulnerability to Breast Cancer. *Journal of Marketing Research* **48**, 413-424 (2011).

31 Tuk, M. A., Zhang, K. & Sweldens, S. The propagation of self-control: Self-control in one domain simultaneously improves self-control in other domains. *Journal of Experimental Psychology: General* **144**, 639-654 (2015).

32 Vohs, K. D. Self-regulatory resources power the reflective system: Evidence from five domains. *Journal of Consumer Psychology* **16**, 217-223 (2006).

33 Tuk, M. A., Trampe, D. & Warlop, L. Inhibitory spillover: Increased urination urgency facilitates impulse control in unrelated domains. *Psychological Science* **22**, 627-633 (2011).

self-control in any task benefit self-control performance in other activities at the same time? A meta-analysis of self-control performance in 18 experiments indicated clear evidence that self-control performance can spread among different tasks at the same time. This is interesting, as these findings indicate that our mind can be highly energy-efficient, and that mental operations can take place in parallel and even benefit and reinforce each other, as predicted by System 1. They also indicate that System 1 does not need to be the enemy of successful self-control, as has been proposed in some dual process models^{32, 34}. Quite the contrary, self-control can spread efficiently and influence multiple tasks at once.

34 Strack, F. & Deutsch, R. Reflective and impulsive determinants of social behavior. *Personality and Social Psychology Review* **8**, 220-247 (2004).

8. Conclusions

So, what can we conclude about the contributions of conscious and unconscious processes in consumer research? And how much evidence is there for the dual system conceptualization? The dual process framework has certainly proven generative in prompting many of my research questions in the past 15 years. Throughout my research, I've encountered multiple examples of processes that seem characterized by at least one property of System 1. In perhaps my most pertinent investigation on the controllability of EC effects with Mandy Hütter, we even found evidence of a process that was characterized by multiple System 1 features: uncontrollable EC effects were also resource-efficient and unaffected by motivation.

Yet at the same time, some important problems with the dual process framework remain. For one, I believe that dividing all thought processes into two neat categories can easily lead researchers to jump to unwarranted generalizations. For example, a believer in a strict dichotomy would be quick to conclude that those uncontrollable conditioning effects, apart from being resource-efficient and unintentional, must then also occur unconsciously. This would be problematic because a) we didn't investigate or prove this, and b) I don't even think it would be true. As a matter of fact, I think those advertising effects of which you are most consciously aware might also be the ones that are hardest to control. I still vividly remember some advertising jingles of laundry detergents in my youth – and once I think about them, I can't get them out of my head. Similarly, in the self-control paper with Mirjam, we found evidence for a resource-efficient self-control system that works on multiple tasks in parallel. That does not mean such self-control efforts need to be unconscious – to the contrary, in several of our studies, self-control was consciously initiated and purposeful, properties normally ascribed to our System 2, but it was also resource-efficient and parallel, which are properties of System 1.

So far, I have seen no convincing evidence in my own, or other people's research, for a process that would clearly be characterized by **all** the features of System 1. Does that mean we need to look harder? No, not necessarily so. We might just as well acknowledge that the human mind cannot be neatly divided into two complementary processing systems. Rather, we should recognize that thought processes can be characterized to a greater or lesser extent by some but not all the features of automaticity. Researchers should start recognizing the full complexity of the human mind. As outlined by Melnikoff and Bargh¹⁷, with four sets of binary features (awareness, intentionality, controllability, resource efficiency), there are 2^4 or 64 possible constellations for processes, rather than a mere two. To go into so much detail would require our research to become more precise, more detailed, and more effortful. Perhaps it would even become a tad less exciting and inspiring if we can't divide our mental world into two neat categories anymore. Book titles might also suffer as "Thinking Fast, Slow, or a Little Bit of Both" might not have sold as many copies as its illustrious, dichotomous counterpart. But if accuracy matters in the pursuit of knowledge, it might be a price worth paying.

9. Words of Thanks

It is a tradition to end the inaugural address with some words of thanks to those who have made it possible that I am standing here today. I would like to start by thanking the Vereniging Trustfonds of the Erasmus University Rotterdam, the Executive Board of the Erasmus University Rotterdam and the Dean of the Rotterdam School of Management, Steef van de Velde, for my appointment as endowed professor. I am similarly grateful to the chair of the department of marketing management, Ale Smidts, and to the chair of my promotion committee, Pursey Heugens, for their invaluable support in the process. Pursey, as our Dean of Research and Scientific Director of ERIM is also an important mentor for me today, as I've taken responsibility for the PhD program of this great school. Both Pursey and Ale have been shining lights for me, teaching me through their example about fairness and focus on quality in management. Thank you both.

Becoming a professor is a long journey which starts as a doctoral student with great dreams and ambitions – as well as many doubts and problems. Having a good supervisor is the difference between life and death in your future academic career. I was blessed with the best and would therefore like to shout a big thank you to my mentor professor Stijn van Osselaer, now at Cornell University. Another formative and formidable influence who has helped me big-time along the way is Stefano Puntoni. Stefano was still an assistant professor when I was doing my PhD here. I quickly found his razor-sharp mind was always two steps ahead of mine and benefited tremendously from the guidance he provided and the joint research projects we set up. Today, Stefano is a full professor in our department and still an incredible mentor to me. Thank you, Stefano, for your collaboration and continued inspiration.

The third person I would like to thank for the profound effect she had on my career is Mandy Hütter. I met Mandy shortly after I'd graduated from the PhD program and had started my first job at INSEAD. I believe it's fair to say I couldn't have made half of the exciting contributions to our knowledge of how evaluative conditioning and advertising work without her contribution. Mandy, you are an inspiring example for researchers everywhere and particularly for women in academia. I believe you must be one of the youngest people ever to have made it to full professor in Germany – and I am happy and hopefully not too delusional to think that our collaboration was an essential part of that achievement too. Thank you, Mandy, for being such a great collaborator, source of inspiration, and for being here today.

There are many more past and present collaborators I would like to thank for enabling and enriching my journey in academia. First, the fantastic doctoral students I've had the pleasure to work with: Kuangjie Zhang, Christilene Du Plessis, Phyliss Gai, and Gizem Yalcin. Working with doctoral students is one of the greatest privileges in my job. The interactions with these smart young research talents are a continuous source of enrichment – and I've been blessed by working with some of the kindest, smartest, and most motivated students in the world.

Second, the gurus at INSEAD who gave me my first job and offered me the best training grounds in the world to learn more about top quality research and teaching: Ziv, Klaus, Amitava, Markus, Paulo, Reinhard, David, Hubert, Jean-Claude, Monica, Hernán, Andrew, Yakov, Hilke and Joerg, thanks for enriching my life while I was there. Especially Pierre Chandon deserves a special mention, focused as he was on maximizing the chances that his junior colleagues would succeed in their challenging new environment. Thank you, Pierre, for everything you did to ensure I would survive, grow, and learn.

Third, my colleagues and friends in the Department of Marketing Management at RSM who collectively make this one of the best places for marketing researchers in the world, due to their focus on quality – and, crucially, collegiality. I have truly never seen another place where colleagues are so willing to help one another. It is the most precious element in our department culture, ensuring the pleasure I find in my job every day, making us all better researchers than we would be on our own. So, thank you, Amit, Maarten, Gerrit, Xi, Yvonne, Alina, Alex, Anne, Christophe, Gui, Gabriele, Jason, Dan, Pieter, Maciej, Bram, Quentin, and Berend. Furthermore, a huge thank you to the department secretaries, Annette and Jolanda, for keeping it all together.

Fourth, I would like to thank the ladies at the ERIM doctoral office, who have to tolerate my inexperience as a manager and are doing such an incredible job in helping to keep our doctoral and research master programs afloat. Thank you so much Monique, Aimee, Miho, Kim, Pia, Natalija, Tineke, Krista and Marinelle for all your help and positive energy.

Then, I would like to thank those individuals who have kept me sane all along the way, their presence always unconditional on – and unconcerned with – any professional achievements. I've never been the person to have a huge group of friends, but at the same time I've always been blessed with having the best group of close friends I could possibly hope for. Frits and Sophie, David and Kim, Kathleen, Danny, Geert, you know me better than anyone, as our friendship has spanned more than two, in some cases three decades now. Thank you all from the bottom of my heart for always being there for me, unconditionally, and for sticking up with me even when I'm sometimes a bit too close to the stereotype of the nutty, distracted, or downright sleepy professor.

I have been extremely privileged in life. I always benefited from a loving environment, from the best education I could possibly get, and I have no-one to thank more for that than my family. Ik wil eerst mijn ouders bedanken. Lieve mama en papa, dank jullie wel voor al de opofferingen die jullie gebracht hebben tijdens jullie leven om jullie kinderen de best mogelijke kansen te geven. Jullie zijn uniek, en zelfs op de moeilijkste momenten wanneer ik echt geen nieuwe kans verdiende, gaven jullie me die toch. Dat is liefde, dankzij jullie sta ik hier, en zonder jullie stond ik nergens. Ik wil ook mijn broers bedanken, Lode en Rob, en hun partners, Sarah en Hannelore, om er voor me te zijn nu al mijn hele leven, en me netjes met mijn voeten op de (Vlaamse) grond te houden. Lieve broers, ik hoop dat we nog vele jaren elkaar door dik en dun kunnen steunen, zoals we altijd gedaan hebben. Ik ben daarenboven ook gezegend met een liefhebbende ruimere familie, ooms, tantes, grootouders, die er altijd gestaan hebben voor ons allemaal. Pas als je ouder wordt, besef je hoe uitzonderlijk waardevol zulk een

familie is. Een speciale vermelding voor mijn grootmoeder, 93 jaar, en er nog steeds in geslaagd om hier vandaag aanwezig te zijn. Dankjewel Monie. En mijn schoonfamilie, jullie ook, lieve Jacques, Marja, Andrea, Gerben, Luuk en Thijs, Ruben en Benthe, en Ouwe Oma. Jullie hebben me met open armen in jullie familie ontvangen, en vormen het warmste tweede nest dat ik me maar kon wensen. Dank voor jullie liefde en steun.

Finally, I would like to thank the one person who has been at my side during the last 14 years. Mirjam, meeting you here in the doctoral program at Erasmus must have been the single most fortuitous event ever to happen to me. We have always been there for each other, first as colleagues, then as friends, as partners, and now as parents. Our relationship is deep at so many levels. I am proud I may call you my wife and every day I try to be worthy of that honor. I am grateful for all the quality time we've spent together, and hopeful we will have even more ahead of us in the future. I am most grateful to you for the greatest gift in life – our two healthy boys, Casper and Wouter. They are the future, and it is to them that I dedicate this inaugural address.

Ik heb gezegd.

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Steven Sweldens is Endowed Professor of Consumer Behavior and Marketing at RSM Erasmus University, Director of Doctoral Education at the Erasmus Research Institute of Management (ERIM), and Distinguished Research Fellow at INSEAD.

Steven's research interests center on the psychological laws underlying advertising and the creation of brand attitudes. The importance of this research has been recognized with several national and international awards. His work has been published in the top scientific journals in marketing (Journal of Consumer Research, Journal of Marketing Research) and in psychology (Journal of Experimental Psychology: General, Personality and Social Psychology Review).

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P.O. Box 1738
3000 DR Rotterdam, The Netherlands
T +31 10 408 1182
E info@erim.eur.nl
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