Choice awareness and manipulation blindness:
A cognitive semiotic exploration of choice-making

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Within cognitive science, "blindness" to choice is commonly treated as typical of human cognition, implying unreliable agents who essentially lack any awareness of their own choices (e.g. Johansson et al., 2005, 2008; Hall et al., 2010, 2013). Within cognitive semiotics, however, choice awareness is seen as a continuous phenomenon, which is susceptible to the influence of a variety of factors. *Manipulation blindness* is proposed as a more adequate term for what is known in the literature as "choice blindness", referring to participants' tendency to accept a choice as if it were their own. This suggests that "blindness" is strictly limited to the level of detection (of the switch of the preferred choice to a non-chosen one), and not to the level of choice.

Using a cognitive-semiotic framework, I examine manipulation blindness as an "indicator" of choice awareness by employing the factors of memory, consequence, and affectivity, and introduce a two-level hierarchy of choice-making. 43 participants were assigned two tasks combining choices with a) two degrees of consequence (more/less) – based on task instructions, and b) two degrees of affectivity (high/low) – based on stimuli with different degrees of abstractness. Participants were first asked to state their preference for one of two alternatives *(choice)*. After that they were shown chosen as well as non-chosen pictures and asked to confirm whether the picture presented was the one of their choice *(memory)*. Lastly, they were asked to justify their choice, although some of the trials had been manipulated (i.e. the chosen card was switched with the non-chosen one) *(manipulation)*. Half of the manipulations were detected, and 75% of these detections occurred for the choices participants remembered correctly. While the consequential impact of the choice did not seem to influence detection, affectivity did. Unlike other experiments that investigate "choice blindness", the results indicate that manipulation blindness is subject to memory and affectivity, suggesting that we are aware of our choices and that we have, to various degrees, access to our intentional acts.

Keywords: affectivity, choice blindness, cognitive semiotics, consciousness, memory, phenomenology, remembering

1. Introduction

The phrase *dis-moi ce que tu manges, je te dirai ce que tu es* (Anthelme Brillat-Savarin, 1826) or else, "you are what you eat" gained much prominence from the 1960's onwards as a slogan for healthy eating. However, what underlies this phrase goes beyond food choices and their potential consequences to our health, to the idea that we are responsible for the choices we make and that these choices define who we are. This idea is central to the topic of this paper, namely, the examination of the phenomenon of *choice-making*, focusing on its relation to memory.

Manipulation blindness, (more commonly known as "choice blindness"), refers to a certain tendency to accept (and verbally justify) a choice that is presented to us as if it were our own even if we have never made it (or more concretely, our failure to detect the switch of a preferred choice with a non-chosen one). In the last decade, this effect has been demonstrated in a series of experiments in different domains and modalities, repeatedly reporting low levels of manipulation detection (e.g. Johansson et al., 2005, 2008; Hall et al., 2010, 2013; Sagana et al., 2014; Cochran et al., 2016). "Choice blindness" is, thus, claimed to be a general research tool to study the relation between choice-making and phenomena such as preference, intention, and introspection (Johansson et al., 2008). This view has implications for the ideas we have of

ourselves as reliable decision makers, the use of introspection as research method, and the scope of our self-awareness of choice. However, when it comes to explaining what underlies "blindness" effects, little is known apart from some "viable candidates" (Johansson et al., 2008, p.153). As far as explanations are concerned, research mainly revolves on the axis of potential cognitive "mechanisms" (Johansson et al., 2008; Sagana et al., 2014).[1] Nevertheless, "blindness" to manipulation might be largely influenced by other parameters, such as memory and degree of involvement in the choice-making, suggesting that the principal conception and interpretation of the phenomenon could be limited.

Using a cognitive-semiotic framework, I here address these issues both theoretically and empirically. Through a choice manipulation experiment, I aim to investigate whether memory for choice can influence participants' detection of manipulation by assessing their verbal reports. Hence, the present paper´s scope revolves around the way factors such as *memory, consequence*, and *affectivity* influence our self-awareness of choice.

The paper is divided into six sections. Section 2 introduces the theoretical background, as well as the aims of the study and the respective research questions. Then Section 3 explains the methodology for the choice experiment and concludes with specific hypotheses. Section 4 and 5 present the results and discussion, respectively. Lastly, Section 6 provides the conclusions and summarizes the study.

2. Theoretical framework

The field of *cognitive semiotics* is here introduced, as well as central notions relevant to the current research. In an attempt to provide a foundation for issues such as our awareness of choice, the philosophical tradition of phenomenology is presented and the concept of *intentionality* is discussed. The phenomenon of choice is further examined from a phenomenological perspective, followed by the description of the so-called "choice blindness" effect and the presentation of the notion of *manipulation blindness*.

2.1. Cognitive semiotics and phenomenology

Cognitive semiotics is a recent synthesis of concepts and methods from, above all, semiotics, linguistics, and cognitive science (Sonesson, 2009; Zlatev, 2015), focusing on the nature of meaning-making and consciousness. Researchers aim to map out the subjective (personal) and intersubjective (social/cultural) character of the human mind, with the living body as the protagonist in the structuring of experience and meaning. A triangular spectrum of methods is used: from first-person "subjective" (e.g. intuition), second-person "intersubjective" (e.g. empathy), and third-person "objective" (e.g. experimentation) perspectives (Zlatev, 2009), ascertaining the primacy of first- and second-person methods in the study of meaning-making and consciousness. The distinction between these three kinds of methods is characterized by the type of perspective the researcher takes to the phenomenon, as well as by the nature of the phenomena under study. Thus, cognitive semiotics formulates concrete research programs, integrating philosophical and empirical questions in a "conceptual-empirical loop" (Zlatev, 2015, p.1058).

Cognitive semiotics derives much of its inspiration from phenomenology, the philosophical school founded by Edmund Husserl in the early 20th century. The point of departure for many phenomenological approaches is the human body, where experiences are not internal or "stored" in the mind/brain, but are sensed and expressed through our bodily actions, binding us with the world and explicating our relationship with it (Gallagher, 2010). The mind embedded in the lifeworld (Husserl, 1936) is directed to various intentional objects (anything that we can be aware

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[1] Previous research dealt with manipulated stimuli (Sauerland et al., 2013), compliance (Johansson et al., 2008; Sauerland et al., 2013), suggestibility (Merckelbach et al., 2011), and memory (Sagana et al., 2014), without sufficiently explaining "blindness" effects.

of), and as such it "is neither internal nor external, but rather beyond this artificial distinction" (Zahavi, 2001, p.153). Phenomenology, as a theory and method, is capable of going beyond what we are focally conscious of (Husserl, 1989)[2] to bring all "parts of consciousness into awareness" (Sonesson, 2009, p.139).[3] The reciprocal relation between phenomenology and the natural sciences has been in focus, with various approaches currently aiming to combine phenomenology and cognitive science (e.g. Varela, 1996; Lutz and Thompson, 2003; Thompson, 2007).

The intentional nature of consciousness implies that experience is the outcome of our situatedeness in the world and our directedness towards the "objects" that are included in it, from inanimate objects and living things to conventions, norms, ideas, etc. The same intentional object can be accessed through different forms of intentionality that are often intertwined, with perception, remembering and imagination as some of the basic kinds of acts of consciousness (Sokolowski, 2000). Perception involves the direct presentation of objects and intends them in their presence in the here-and-now. Remembering and imagination intend their objects in absence, as presentified.

Perception is an interplay of presences and absences, since an object is experienced through the sides which are presented to us, some of which are shown and visible, intended in their presence, for example when looking at the Mona Lisa painting in the Louvre. Others are hidden and invisible, intended in their absence, as knowing that there is the backside of the painting, although we cannot see it. There are also particular ways in which the side of an object is presented to us – the perspective from which we perceive it, open to many perceivers – as well as our subjective dispositions in the current time and place: our own moods, health state, etc. However, perception also includes the process of recognizing the object and making judgments about it, allowing us to discover a new level of the object's identity. The application of perceptual judgments on what we experience, called *categorial intuition*, is accomplished by a shift from the "simple" way of perception (e.g. admiring Mona Lisa) to a more complex one (e.g. noticing that Mona Lisa is smiling enigmatically). This shift from "pure" experience to judgment comes before language, but at the same time our categorial activities may be influenced to a certain extent by the language we possess. Categorial experience is involved in our choice and decision-making acts, since it brings in the properties of reasoning and rational thinking (see Section 2.4). While perception may be our basic form of meaning-making, it blends seamlessly into more indirect forms of intentionality, such as remembering.

2.2. Remembering

A typical view of memory from the perspective of traditional cognitive science is that of a storage device where experiences leave some kind of trace saved in our mind, re-excited under the effect of a certain stimulus, making later recall possible (e.g. Gallistel and King, 2009; Kahneman, 2013).[4] A notion that often occurs in the discussion of memory is "constructiveness"

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[2] Following Husserl's terminology throughout this paper: in *presentation* (Vorstellung), the (intentional) object is given in its direct, lived presence; in *presentification* (Vergegenwärtigung), as in imagination, the (intentional) object is not directly and intuitively given; in *representation* (Repräsentation), the (intentional) object is given with the mediation of signs. For the semiotic relevance of the distinction, see the discussion of Sonesson (2015).

[3] The notion of the unconscious in the phenomenological sense concerns background conditions present in all intentional acts (Brooke, 1986), which constitute integral parts of the structure of experience, and thus, it is, from a broader perspective, accessible to consciousness.

[4] Due to the fact that cognitive science is a highly interdisciplinary field of study (combining psychology, computer science, neuroscience, anthropology, linguistics, and philosophy), it encompasses several different perspectives to studying human cognition. Thus, with references such as "traditional" or "mainstream", I mean to suggest approaches that treat cognition in terms of representational structures in the mind and computational procedures that operate on those structures, advocated by thinkers (and even initiators) of cognitive science such as Chomsky, Fodor, Dennett, Pinker, to name some of the most prominent.

(reconstructiveness) referring to the omitted or distorted items/traces of memory and likewise, our ability for remembering is treated in terms of "(in)accuracy", "distortion", "impairment", "decay", etc. Under the phenomenological prism, however, memory is not treated as the opposite of forgetting (Merleau-Ponty, 2010), but rather as another way of reliving a perceived event within a mélange of presences and absences, as discussed earlier. That is, we do not bring back our preserved, past experiences, but we actively reenact in presence these earlier (absent) perceptions:

> We are something like spectators when we reenact things in memory, but we are not just spectators, and we are not like viewers of a separate scene. We are engaged in what happened then. We are the same ones who were involved in the action; the memory brings us back as acting and experiencing there and then. Without memory and the displacement it brings we would not be fully actualized as selves and as human beings for good and for ill. (Sokolowski, 2000, p.71)

In remembering (but also, in imagining) the identity of the object unfolds through presentification, that is through intending it in time and place other than in the direct perception of the here and now, but at the same time, the identity of the self "transforms" too through displacement (Sokolowski, 1990). Displacement (*Versetzung*), as Husserl (1966) terms it, not only allows us to discover new ways of seeing things by disclosing different dimensions of the intended objects, but also opens up new dimensions of our own selves. This new kind of dual (self) awareness can be explicated as "a remembering me, and a remembered me" (Sokolowski, 1990, p.178): the part of myself that right now remembers X and the part that experienced X at some time in the past. These parts of ourselves put together constitute our identity, where we "always liv[e] in the present and still in the past and already in the future" (ibid, p.180), where we are always simultaneously both present and displaced.

The active process of reliving the perception of an event in the way we once perceived it allows for the possibility for "errors", in the sense that we might project things into the remembered event that we would like to see or that we think we should be seeing; yet, these constructions are not treated as a fault or vice of memory, since in phenomenology, accuracy and inaccuracy are not the central properties of memory:

> Memories are notoriously elusive; they are not tamper proof, but such are the limitations of memory. […] [T]heir way of being right and their way of being wrong are different from the ways of being right and wrong in perception. A new manifold, a new possibility of identity, is introduced by memory, and new possibilities of error arise as well. (Sokolowski, 2000, p.69)

The phenomenological approach to memory (e.g. Mishara, 1990; Zahavi, 1999; Sonesson, 2009) embraces the conscious present and the "unconscious" past in a dimension that connects the two, to synthesize the identity of our bodily existence that is manifested both explicitly and implicitly in our decisions, choices, dispositions, inclinations, habits, errors, omissions, etc. We may use the cognitive science terms of "explicit" and "implicit" memory,[5] but paradoxically the most important part of remembering belongs to "memory that does not remember" (Kozyreva, 2016, p. 221).

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[5] Explicit memory corresponds to the presentational and/or the presentified aspects of intentional remembering. Implicit memory is defined as "encompassing habitual bodily skills, […] traumatic and intercorporeal memory, as well as involuntary memories and pre-thematic recognitions" (Kozyreva, 2016, p.221) (See also, Casey, 1987; Fuchs, 2012; Summa, 2014). Section 2.4 discusses these notions more with respect to the two–level hierarchy of choice, corresponding to two different kinds of consciousness, namely, operative intentionality and categorial intuition.

2.3. Bartlett's theory of remembering

One of the foundations upon which modern work of cognitive psychology has been built is Bartlett's (1932) publication *Remembering,* which contributed with significant theoretical and experimental insights to the study of memory (Kintsh, 1995; Roediger, 2003). In fact, it was Bartlett who first initiated the notion of constructiveness, and most notably not as distortion, as it has typically been interpreted in mainstream cognitive science (Wagoner, 2017); rather, as the positive characteristic of memory that warrants us the flexibility to cope with the needs and challenges of the world we are placed in along with its wide range of continuous changes. Bartlett's (1932) conception of memory is as a functional, embodied activity, having a future-oriented social nature:

> There is no reason in the world for regarding … [the traces] as made complete at one moment, stored up somewhere, and then re-exited at some much later moment. The traces that our evidence allows us to speak of are *interested-determined*, *interest-carried traces*. They live with our interests and with them they change. (ibid, p.212, my emphasis)

Bartlett theorizes that the activity of remembering is based upon "living, constantly developing" (ibid, p.200) schemata understood as an "organized setting" (ibid, p.201) of past reactions or of past experiences integrated with new influences to which we are constantly subjected. These active settings are constructed upon our impulses (visual, auditory, etc.), allowing our response towards something in particular, but always in relation to our previous, similar responses. Notably, the basic characteristic of schemata is that they function in an interrelational way by connecting elements from different sources into a new form, where each element triggers another element, allowing us to freely pick out the most adequate in order to respond to a present need: "in remembering, the subject uses the setting, or scheme, or pattern, and builds up its characteristics afresh to aid whatever response the needs of the moment may demand" (ibid, p.196).[6]

The constructive adaptation of our past to present advocates for a social/context-based approach to memory, rather than as a process that takes place in isolation of other factors, and as Bartlett (1932, p.206) acknowledges, it is closely linked to consciousness:

> An organism has somehow to acquire the capacity to turn round upon its own schemata and to construct them afresh. This is a crucial step […]. It is where consciousness comes in; it is what gives consciousness its most prominent function.

2.4. Two-levels of choice and veracity

For choice-making two central kinds of consciousness need to be acknowledged, corresponding to two different types of memory, and forming a two-level hierarchy of choice-making:

- *Operative intentionality:* the (lower) level of pre-reflective consciousness that establishes "a natural, pre-predicative unity of our being in the world and of our life […] that appears in our desires, our evaluations, and our landscape" (Merleau-Ponty 2012, p. xxxii). It is the source of our more rapid and intuitive choices, and correlates with the implicit form of body-memory. [7]

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[6] It is important to mention that Bartlett as a true experimental psychologist was dedicated to taking a "strictly functional point of view" (xviii), drawing his theoretical insights on the basis of a series of experiments and providing a plethora of descriptions and examples.

[7] Zlatev (2018) includes *operative intentionality* in his level-based analyses of meaning-making (i.e. life, subjectivity, intersubjectivity, sign function, and language), where to each level "corresponds a dialectics of spontaneity and sedimentation, with corresponding normative structures (e.g. habits, emotions,

- *Categorial intuition*: the (higher) level of reflective consciousness (of act-intentionality) that gives the basis for a predicative, but still pre-linguistic choice based on "our judgments and […] voluntary decisions" (ibid). It provides the foundation of reason and thought, while generating our slower and more deliberate intentional acts.

Operative intentionality is a form of (bodily) awareness that occurs simultaneously and "passively" as we perceive objects (Lutz and Thomson, 2003). It comes before reflection and the forming of beliefs, reaching the place where our impressions and impulses reside, and making it the source of our more spontaneous choices. The key in approaching and understanding operative intentionality is our living body, and its being-in-the-world. Through this bidirectional interaction we constitute both our self and the world. This kind of bodily intentionality is manifested not only explicitly in the things that are perceived, but also in an implicit manner "surrounded with references to the past and future, to other places and other things, to human possibilities and situations" (Baldwin, 2004, p.10). Hence, it comes before our explicit awareness, but is still part of our consciousness since it is generated from our natural directedness to the world.

Our experience of ourselves and the world is layered in a such a manner that our present experience rests on our past experience through a process of *sedimentation*, which "is crucial in the genesis of intentionality and functions as a horizon for all present experience […] [that] becomes reawakened in the individual acts" (Føllesdal, 2004, abstract). The sedimented structures in our body (schema) are "revealed" in our various acts. However, these habits are by no means automatic and mechanical, since they reflect a level of normativity and intentionality (Zlatev, 2018).

When we lift ourselves over the level of operative intentionality to act-intentionality, we reach categorial intuition, where objects and the various ways they are manifested can be explicitly asserted. By "categorial" (intentionality, registration, speech, etc.) Husserl refers to the kind of thinking and experience that goes beyond simple perception to making judgments. Categoriality is the level on which we turn from operative intentionality and simple perception to explicit "features" which serve as the basis for deliberate choices that we can contemplate and reflect upon. Categorial thinking provides us with the reasons we put forth when we choose X over Y; it monitors our (operative) intentionalities, forms categories, and gradually allows us to put words to our actions. It generates ideas that are registered, conducted rationally, and explicated with language.

The choices we make are products of the combination of operative intentionality and categoriality, with both levels requiring attention: in the former, our attention is somewhat diffused, while in the latter it is directed and focused towards specific features. While we are not deterministic machines even on the first level, it is the second that makes us fully free agents, as argued by Zlatev (2018, p.17):

> While affective/emotional motivation operates already on bodily movements, where we are more or less "automatically" drawn to what is attractive, and repelled by what is repelling, with primary subjectivity and even more so with reflective consciousness, we become increasingly free in our choices.

When we make a choice, we perform an act motivated by a plethora of reasons, some of which might be very obscure even to ourselves. Operative intentionality is like a tunnel starting off from the implicit obscure part of our experience to the explicit expression and manifestation of it with our categorial reasoning. We drive through the topography of our actions with the wheels of our operative intentionalities, directing them with the steering wheel of categoriality. In this journey, we might take wrong turns, but this does not make the journey any less true, since our acts are

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conventions, signs and grammar) … emerging from and constraining, but not determining, subject-world interactions" (ibid: abstract).

ours (in all the various ways they are manifested) and we are our acts. Through this bidirectional relation we demonstrate ourselves as "agents of truth" (Sokolowski, 1990, 2000, 2008). This notion expands from the plain notion of "(rational) human being" to encompass a wider range of understanding (even those that come before categoriality) and reflects our "human inclination to attain the truth of things" (ibid, p.20), in the broader sense of veracity: [8]

> Veracity is the impulse toward truth, and the virtue of truthfulness is its proper cultivation. Veracity is the origin of *both truthfulness* and the various ways of *failing to be truthful*. Thus, lying, refusing to look at important facts, being careless or hasty in finding things out, and other ways of avoiding truth are perversions of veracity, but *they are exercises of it*. (ibid, my emphasis)

Veracity elevates the sense of human rationality into the passionate mode of seeking the truth, making us active agents of truth, despite of, or perhaps due to all of our omissions, failings, oversights, and errors, since they are just equal manifestations of our experience (Brooke, 1986).

2.5. "Choice blindness" and "manipulation blindness"

The perspective of mainstream cognitive science is quite different from that presented in the previous sub-section. In "choice blindness" (henceforth, CB) studies, participants tend not to notice inconsistencies between a choice they made and the alternative that they are asked to justify. Such experiments in a variety of domains have reported relatively high "blindness" rates of different nature (e.g. political and moral preferences, decision making) (Hall et al., 2010, 2012, 2013; McLaughlin and Somerville, 2013) in different sensory modalities (e.g. vision, taste and smell) (Hall et al., 2010; Sauerland et al., 2013). Recently, the focus has been on memory, but such research is still limited and mostly studied in regards to eyewitness recollections (Sagana et al., 2013; Cochran et al., 2016; Stille et al., 2017). Below, I review some of these findings, before discussing them and motivating an alternative approach.

The focus of the initial CB studies was on choice in relationship to awareness and introspection (Johansson et al., 2005, 2008), and involved a choice task based on preference. Participants were assigned to choose from a set of 15 picture-pairs of female faces the one they found more attractive, while manipulating 3 of them (i.e. substituting the chosen picture with the non-chosen one), as shown in Figure 1. Participants had to orally justify their "choices" for both the 3 manipulated pictures and 3 of the non-manipulated ones. As factors for the experiment, deliberation time in three conditions (2s, 5s, free deliberation time) and similarity of the face-pairs in two conditions (high similarity and low similarity) were considered, but without finding significant effects. The results showed that participants often failed to notice the switch of their actual choice to the one they were presented with (74%); and in addition that they "confabulated" arguments to support choices they had never made, exhibiting the same (high) degree of confidence and homogeneity for both types of reports (manipulated and non-manipulated).[9]After the experiment, a debriefing session took place where participants were interviewed to check retrospectively for detected manipulations, while they were informed of the true nature of the experiment.

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[8] Research in different areas, such as those of attribution, persuasion, and lie detection has reported that people are particularly inclined to believe what others tell them (Jones, 1979; Zuckerman et al., 1981; Petty and Cacioppo, 1986). Psycholinguistic research has also shown that people are generally quicker to assess the validity of true rather than false affirmative sentences (e.g. Gough, 1965; Trabasso et al., 1971; Carpenter and Just, 1975).

[9]According to Nisbett and Wilson (1977), *"confabulation"* is used to refer to the explanation participants' gave for their behaviours with reference to factors known by the experimenters to be insignificant or irrelevant, while failing to report factors that were essential: "such reports are often based on a priori theories about behaviour–were they cultural, personal, or both–drawing the conclusion that people *do not have actual introspective awareness"* (p.233).
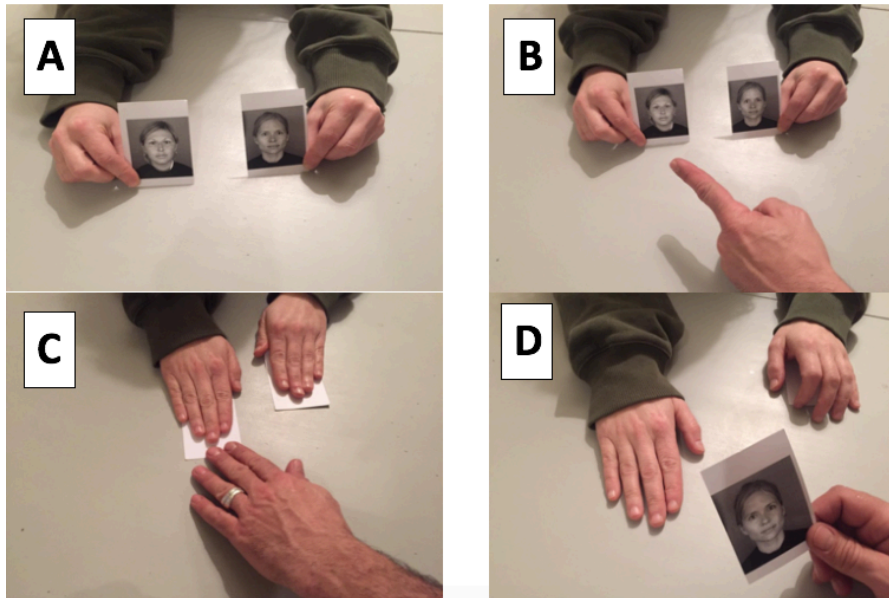
Figure 1. The choice blindness procedure

The findings from this, and related studies, are presented as evidence for a "robust phenomenon [used] as a general research tool to study decision making, intentional action, [and] introspection" (Johansson et al., 2008, p.151). Its bases are the two recurring points: the low detection rates of manipulation, and the similarity between the reports of manipulated and non-manipulated groups.[10] Resting on these observations, CB researchers draw a strong conclusion:

> […] our experimental results clearly support an *anti-introspectionist view*. If we are supposed to know our own minds from the inside, we should know why we do what we do. And when asked to describe why we chose a face we in reality did not prefer, we are not supposed to just fabricate reasons (at least not without knowing that this is what we are doing). In our experiments, it is evident that the participants *do not have perfect access* to their underlying cognitive machinery. (ibid, p.20, my emphasis)

This indicates an effort to present a tendency as a general phenomenon based on a number of features, which are at least problematic. First, the assertion that participants lacked "perfect access" to their cognition is a straw-man argument, since it refutes a claim that no one really makes (see Lutz and Thompson, 2003; Prinz, 2003). Second, the low rates of detection exhibit a recurring tendency to be "blind" to manipulation, but they also show that this "blindness" is subject to variation: in all experiments, many people accept the manipulation, but many participants also resist it. This implies that certain factors are able to influence some people under particular conditions more than others and we need to know how different degrees of choice awareness can be due to the effect of a variety of factors (e.g. experimental conditions, topic of research, way of manipulation, individual characteristics). Third, the observation of homogeneity between non-manipulated and manipulated choices does not necessarily indicate that differences could still not exist, since, as is well known, "the absence of evidence is not evidence of absence" (Rees, 1973).

Previous research on CB shows diverse findings. For instance, research involving CB and memory suggests that the general tendency for participants is to remember the manipulated choice as their genuine choice (e.g. Johansson et al., 2008; Cochran, 2016; Stille et al., 2017). However,

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[10] For the original experiment (Johansson et al., 2005) the criteria of similarity were that of *emotionality* (i.e. how emotionally engaged participants were with their reports); *specificity* (i.e. how specific participants were with their reports); and *certainty* (i.e. how sure they were about the choice they made).

antithetical to this finding, Sagana et al. (2014) report that participants did not appear to adopt the manipulated version as their genuine choice and were much more often consistent with their original rather than with the manipulated one. One of the most significant contributions of this research is that it shows that even though participants are often "blind" towards manipulation, they are able to recall their original choices when they were informed that manipulation was involved in the task, suggesting that we are (to a certain extent) aware of our choices. Accordingly, in research not limited to external experiences (such as recollections of faces), but to autobiographic memories the effect of "blindness" was nearly absent (Sauerland et al., 2013), clearly indicating that different kinds of cognitive processes allow different degrees of conscious awareness. Further, the diversity of the results in CB studies, even when conducted by the same researchers on similar topic areas (see Sagana et al., 2013, 2014), suggests that the methodological approaches taken across different studies (e.g. "type of decision, manner of manipulation, ways of measuring detection, and other experimental variables") (Cochran et al., 2016, p.2) need to be taken into account, as acknowledged by the original CB authors:

> From a common sense perspective, it seems like these factors [e.g. consequences for choice, concreteness of the choice task] would influence both detection rate and memory of initial choice, but it remains to be empirically decided. (Johansson et al., 2008, p.153)

For the experimental design of the present study, I employ similar factors to those of CB experiments, but alter its overall phases and instructions, aiming to limit the manipulation to the actual outcome of participants' choices, and to ensure the most ethical conditions possible to allow for a choice-manipulation task to take place (see Subsection 3.1.3). Thus, besides memory, the factors this research employs are consequence and affectivity based on two tasks (more/less consequential) and two types of stimuli (human faces /abstract figures – in the form of inkblots). Consequence is relevant, since we tend to be more invested with choices of greater impact and less with those that influence us superficially (e.g. Iyengar, 2011). So, for the more consequential choice task participants may be expected to reflect more on the alternatives and set their personal (significant) criteria on making the most adequate choice, ultimately enhancing their way of remembering the choice and detecting manipulation, even if consequences could only be imagined and not actually experienced. Likewise, affectivity is acknowledged to be a crucial factor to memory (e.g. Derouesne, 2000; Zaborowski, 2018) and faces can be expected to be more affect-arousing than inkblots. Furthermore, the pictures of human faces and abstract figures also differ in terms of *pictoriality*,[11] which can also be expected to make the choices of faces more memorable and manipulations of such choices more detectable. However, it should be noted that affectivity and pictoriality are separate factors that are inevitably combined in the experiment, since the human faces' stimulus "carries" both. To recapitulate, the lack of a sufficient explanation of CB, the unclear and inconsistent connection between the CB and memory, and the fact that various factors throughout research seem to influence differently "blindness" occurrences intensify the motivation for and relevance of the present investigation. If factors such as those adopted in the present research (i.e. memory, consequence for choice, affectivity) are able to influence participants' detection of manipulation and thus testify to various degrees of choice awareness, then the conclusion that we are in general "blind" to our choices can be questioned.

Before we proceed, I propose a terminological revision to suggest that participants' "blindness" is strictly limited to the level of detection (of the switch of the preferred choice to a

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[11] Pictorial consciousness, according to Husserl (1980), involves distinguishing between "the picture thing" (the physical picture), "the picture object" (what the picture depicts) and the "picture subject" (the referent in the world. The triadic relation of the picture sign was developed further by Sonesson by distinguishing picture subject (the picture object with its "lifeworld colors") and picture referent (see, Sonesson, 1989, 2006, 2015)

non-chosen one), and not to the level of choice (on either the level of operative or categorial intentionality). Thus, at most, we can call this *manipulation blindness*.

The process of choice-making, from the CB approach, is seen as a rather passive event during which participants are regarded as distinct spectators rather than as active agents, and in their effort to make sense of their actions they "fabricate reasons" (Johansson, 2006, p.20).[12] On the other hand, the notion of manipulation blindness is neutral with respect to the degree of conscious awareness in choice-making, and does not prejudge that "we do not know as much about ourselves as we think we did" (Johansson, 2006, p.39). I return to the matter of our self-understanding in Section 5, after first presenting the design and results of the empirical study.

2.6. Summary and hypotheses

In this section, the theoretical background for the understanding of remembering and the phenomenon of choice in a phenomenological approach was provided. The framework of cognitive semiotics was introduced, and the ways in which various kinds of objects are intended were discussed with a focus on remembering. Then, the phenomenon of choice, as well the proposed two-level hierarchy of choice-making were presented. Lastly, the focus was drawn to the construct of CB and a short review of previous studies was discussed, followed by the explication of the term "manipulation blindness". From all this, the question rises whether various factors (such as memory, consequence and affectivity) are able to influence our choice making, and thus testify as "indicators" of various degrees of choice awareness. On this basis, the following general hypotheses can be formulated:

- Memory for choice plays a significant role in manipulation blindness, and there will be higher detection rates of the manipulations for the remembered choices and lower for the non-remembered ones.

- Consequence of choice influences memory (our way of remembering our choices), and thus there will be higher detection rates of the manipulations for the more consequential choices and lower for the less consequential ones.

- Affectivity influences memory, and thus there must be higher detection rates of the manipulations for the choices with higher affective valence and lower for those with lower affective valence.

3. Methodology

3.1. Design

A forced-choice experiment that consisted of two tasks was designed. Participants were divided into two main groups, and each group was assigned two tasks. The tasks combined the assignment of choices with a) a different degree of choice-consequence (more/less consequential) based on different task instructions; and b) a different degree of affectivity (high/low affective valence) and pictoriality, based on stimuli with different degree of abstractness.

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[12] It is asserted that the processes responsible for deliberation and decision making operate according *to deterministic* causal laws (Shepherd, 2014), that is as an ultimately passive spectating: "we have to wait and see how we are going to decide something, and when we do decide, it bubbles up to consciousness from we know not where. We do not witness it made; we witness its arrival" (Dennett, 1984, p.78), as opposed to experiencing ourselves as active causes, actively engaging in our mental activities.

3.1.1. Stimuli

Two different types of stimuli were selected for the two choice tasks: pictures depicting human faces and abstract figures in the form of inkblots. The use of qualitatively different types of stimuli secures differences in the type of selectivity, in relation to, for example, participants' cognitive and affective predispositions (Bartlett, 1932) and pictoriality (Husserl, 1980). Further, both kinds of stimuli have already been used extensively in similar studies in both CB experiments, as well as psychological studies of various kinds (e.g. Dearborn, 1898; Bartlett, 1932; Goldstein and Hersen, 2000; Schott, 2013; Dubey et al., 2018), allowing easier comparison with previous approaches.

The pictures of human faces were collected from the Psychological Image Collection at Stirling's (PICS) online face database (www.pics.psych.stir.ac.uk). The pictures of the inkblot figures were collected from several online sites. For each type of stimulus, 40 pictures were selected, creating 20 pairs (included in Appendix I). The pictures were chosen in a way to ensure a considerable degree of similarity within each pair, and variation between pairs. Within the main CB experiment (Johansson et al., 2005), the conditions of low-similarity and high-similarity were not shown to affect "blindness" rates. Thus, the matching of similarity in this research's experiment was not estimated on the basis of quantitative grounds, but rather on qualitative factors that concerned both the characteristics of the physical pictures (e.g. their size, printing quality, material, etc.), as well as the characteristics of the "picture object" (i.e. what the picture depicts). For the latter, I took into considerations both technical aspects such as background luminance, color density, distance of the shot, position in the photo-frame, etc., as well as the distinct characteristics of the depicted object. For the human faces, these were face shape, facial characteristics (size and shape), hair length, type and color, any special features (glasses, beard, etc.). For the inkblots, the criteria considered were the shape of the figure, height, width, density, and the figure's resemblance to some physical object. For both kinds of stimuli, grey scale pictures were selected and printed out on cardboards cards, with measurements 9X6 cm each. Examples of a picture-pair of each kind of stimulus are shown in Figure 2.

3.1.2. Participants and ethical considerations

Forty-three native speakers of Greek (17 male and 26 female, with mean age 36 years) participated in the study. Participants were recruited via personal contacts in the wider region of Pieria in Greece and Skåne in Sweden in order to secure a sufficient number of subjects. Participants were told that the experimenter was interested in the processes of choice-making and remembering. The participants were evenly divided in two main groups, roughly balanced for age and gender, for the sake of presenting the different conditions, and the order between them (see below). No participant had ever taken part in previous research involving any kind of choice (manipulation) blindness. No other factors were controlled for the selection of the participants and the formation of the groups.

Prior to the experiment, participants were asked to give their written consent. They were notified that they would be video-recorded and that they had the possibility to withdraw from the experiment at any time without providing any reason. After the experiment, participants were debriefed about the true nature of the experiment's purpose and were given the opportunity to voice any concerns.
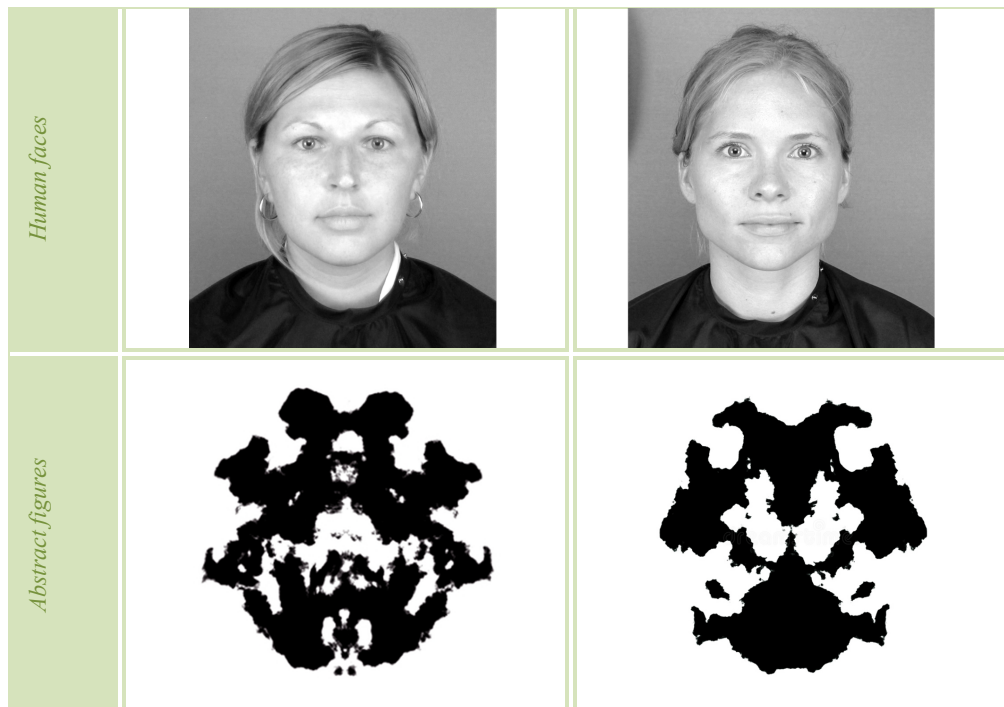
Figure 2. Sample of picture-pairs per type of stimulus

3.1.3. Setup and procedure

The experiments were conducted in Greece and Sweden, in the regions of Pieria and Skåne, during the months June-August, 2018. Similar conditions were secured for all locations: a room with a suitable table. A video camera, a camera tripod, two laptops and a set of headphones were included in the equipment used for the experiment. Most often the recordings took place in a home environment.

The two groups of participants were each assigned a different version of the choice task. One group was asked to choose between a pair of photographs of human faces the one they found more attractive (less consequential choice/high affectivity) and between a pair of abstract figures the one they would pick if they were to get an ink tattoo (more consequential choice/low affectivity). The other group of participants was asked to choose between a pair of human faces the one they would choose to be with on a deserted island (more consequential choice/high affectivity) and between a pair of abstract figures the one they found more aesthetically pleasing (less consequential choice/low affectivity). In order to minimize influence from the sequence of presentation of the tasks (tiredness, familiarity with the task, etc.), each of the two main groups was sub-divided into two, altering the order in which the two tasks were presented for each subgroup. Table 1 illustrates the tasks and conditions of the experiment.

Table 1. Tasks and conditions of the experiment

TASKS/ STIMULI	GROUP 1	GROUP 2
Task 1 *Human faces*	**1(a)** Condition: Less Consequential + High Affectivity "Who do you find more attractive?"	**2(a)** Condition: More Consequential + High Affectivity "If you were to be on a deserted island and could only take one person with you, who would you choose?
Task 2 *Abstract figures*	Condition: More Consequential + Low Affectivity "If you were to get an ink tattoo, which of the figures would you choose?"	Condition: Less Consequential + Low Affectivity "Which figure do you find more aesthetically pleasing?"
Task 1 *Abstract figures*	**1(b)** Condition: More Consequential + Low Affectivity "If you were to get an ink tattoo, which of the figures would you choose?	**2(b)** Condition: Less Consequential + Low Affectivity "Which figure do you find more aesthetically pleasing?"
Task 2 *Human faces*	Condition: Less Consequential + High Affectivity "Who do you find more attractive?"	Condition: More Consequential + High Affectivity "If you were to be on a deserted island and could only take one person with you, who would you choose?

The participants were informed that they would participate in a choice task based on individual preferences. The written instructions (Appendix II) were handed over along with the informed consent form. Basic points of the task were repeated orally: they were reminded that this was not a test with right and wrong answers, but a task aiming to survey how we make choices and remember them, and that precisely because of this, they were allowed and even encouraged to talk during the procedure. Furthermore, they were informed that they could take as much time as needed, although the overall procedure was estimated to last between 30 and 60 minutes (including, if they wanted, a short break between the first and the second task). Finally, they were told that they would get information on their performance at the end of the experiment.

Each part of the task was completed in three steps, after participants were presented with 3 picture-pairs as warm-ups and were asked if they had any questions. In the *first step,* participants were presented with 20 picture-pairs in a sequence, where they were asked to choose one in each pair according to the instructions of each task (see Table 1). Their responses were categorized into two piles: (+) for chosen pictures, (-) for the non-chosen. In the *second step*, participants were presented with one picture at a time, 10 of those they chose (+) and 10 of those they did not (-)

and were asked to confirm whether each picture belonged to their choices ("Is this one of those you chose?"). At all times, the pictures presented in this step were selected in the following manner: the first 10 pictures of the (+) pile, and the last 10 pictures of the (-) pile, in order to allow for a higher probability of remembering non-chosen stimuli in the next step of the task. Participants' responses were simultaneously categorized into four piles, as illustrated in Table 2.

Table 2. Categories of responses

REMEMBERED (R)		MISREMEMBERED (M)	
+	–	+	–
Chosen pictures remembered as chosen	Non-chosen pictures remembered as non-chosen	Chosen pictures misremembered as non-chosen	Non-chosen pictures misremembered as chosen

Then the participants were asked to watch a short film lasting roughly 5 minutes on a computer screen, and provided with headphones to listen to the voiceover and accompanying music.[13] They were told that this was part of the task, although this was actually a break that allowed the transition to the final step by giving the researcher the time to match all the cards to their initial pairs and conduct the manipulation. In the *third step*, participants were presented again with the 20 picture-pairs (of step 1) and each time they were asked to justify the choice they were presented as their own ("Why did you chose this one?"); however, 4 of the picture-pairs were manipulated: one of each category shown in Table 2. The "chosen" picture of each pair was presented always at the same position on the right side of the participant, while concurrently asking them to justify their choice. The manipulated pairs appeared at the same position in the sequence (4, 8, 12, 16) and in the same order (+R, +M, -R, -M). The manipulation was conducted by substituting the non-chosen picture for the one actually chosen, and presenting it to the participant as "chosen". The few cases where participants provided less than the four anticipated categories of responses shown in Table 2 were treated as the rest, manipulating one card of each category the participants had formed.

In cases of detection of manipulations, I claimed that this was accidental and explained this as an unintentional mix-up of the pictures' cards. When the participants provided their motivations for all picture-pairs, the first task in the experiment was completed. In the second task, the exact same procedure was followed, but assigning the participants a different instruction and a different kind of pictures, as shown in Table 1. At the end of the second task, participants were asked if they had any questions; afterwards, they were (shortly) interviewed on their overall impression of the task in order to assess potential detection of the manipulations retrospectively (e.g. "What did you think about the experiment?"; "Did you find anything odd about the experiment?"). All of the sessions were videotaped, and the responses for the manipulated choices were later transcribed verbatim and translated into English.

The methodological triangulation that cognitive semiotics advocates (see Section 2.1) was reflected in the design of the study. A first-person method was used for the analysis of the participants' responses and intuitive judgments as described in the following section. This step of the analysis involved the combination of intuition on intersubjectively shared experience, and introspection on idiosyncratic, subjective experience (Itkonen, 2008). A third-person method was used for the analysis of the quantitative data from the experiment. Importantly, a second-person perspective method involving social interaction between experimenter and participants was

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[13] The two selected short films were: 1) Charles Bukowski's animated poem, "The man with the beautiful eyes" (5.37'') for the task with human faces as stimuli, and 2) Rafael Deugenio's film on a selection of F. Pessoa's poems, "Meanings" (4.50'') for the task with abstract figures as stimuli. These were chosen so as to be relatively engaging, and as they dealt with issues of aesthetics, they could be seen as belonging to the context of the experiment.

critical. In order to ensure that the experiment would truly involve "a simple choice task in combination with a covert manipulation of the outcome of the choices made", as stated by Johansson et al. (2008), the manipulation was strictly limited to the presentation of the "wrong" card. From that point on, I adopted a rather naive stance, allowing participants the liberty to express themselves freely, engaging with them in an open dialogue. The reason for that was to minimize the authority that the researcher's role might carry and to make the interaction more equal. This was an important aspect of the methodology, since authority could be in its own right a factor influencing participants' detection of manipulation, and a more firm or categorical stance from the researcher's side could negatively affect participants' (expression of the) detection of manipulation. The adopted naïve stance of the experimenter, the design of the experiment itself, and the fact that the participants were recruited from the experimenter's social circles allowed for casual interaction, dialogic communication, and an empathetic approach between both sides to develop, as in any other natural social context.

3.2. Classification of responses

Participants' responses for the manipulated trials were annotated with respect to the type of detection and categorized into three levels, shown in Table 3. Each level included one or more patterns that characterized participants' responses for both the *manipulated cards* (M.C.) and *preferred cards* (P.C.) of the manipulated trials, forming a (10-category) scale, described with examples below.

Table 3. Type of detection, type of response, and patterns of responses

TYPE OF DETECTION	*TYPE OF RESPONSE*	*RESPONSE PATTERN*
Clear	Categorical	Reject M.C. and justify the choice of the P.C. (1)
	Conciliatory	Question, reject M.C. and justify the choice of the P.C. (2)
Possible	Uncertainty	Question M.C. and state preference for P.C. (3) Question M.C. and justify M.C. (4) Do not motivate M.C. and state preference for P.C. (5) Motivate M.C. and state preference for P.C. (6)
None	Ignorance	Do not justify M.C. (7) Cannot justify M.C. spontaneously, but does so reluctantly. (8)
	Indifference	Evaluate choices as of equal weight. (9)
	Acceptance	Justify M.C. (10)

For the Clear Detection level, the patterns in participants' responses were either to reject the M.C. as their choice and to justify the choice of the P.C. in a rather monological manner, coded as *Categorical* or else to question the M.C. and then reject it by simultaneously justifying the choice of the P.C. in a more dialogical way, coded as *Conciliatory*, as the examples (1-2) show, respectively.

(1)   B: *Διάλεξα αυτό [P.C.] γιατί είναι πιο απλό.*
        'I chose that one [pointing to P.C.], because it's simpler.'

(2)   B: *Αυτό διάλεξα;*
        'Is this the one I chose?'
        A: *Όχι;*
        'Isn't it?'

B: *Μου φαίνεται πως διάλεξα [P.C.] [A: α! σορρυ] μου φαίνεται πως διάλεξα αυτό [A: οκ], γιατί σα να σκέφτηκα ότι αυτό μου κάνει με μελάνι χυμένο, ενώ αυτό μου κάνει με αίμα χυμένο. Ναι, νομίζω ότι διάλεξα το μελάνι.*
'It thinks I chose [pointing to P.C.] [A: oh, sorry] I think I chose this one [A: ok], because I kind of thought that this looks like spilled ink, while this looks like spilled blood. Yes, I think I chose the ink.'
A: *Οκ.*
'Ok.'

The second level, Possible Detection, includes four different categories, all coded as *Uncertainty*: the participants questioned the M.C. as their choice and either stated their preference for the P.C., as in example (3), or justified the P.C., as in (4). According to the other two categories, the participants either did not provide any motivations for the M.C. in order to justify it as their choice, as in (5), or in those cases that they did, they all stated their preference for the P.C., as in (6).

(3)   B: *Αυτό διάλεξα, ε; Δεν ξέρω...*
'This is the one I chose, right? I don't know...'
A: *Γιατί αμφιβάλλεις;*
'Why do you have doubts?'
B: *Το άλλο μου κάνει για πρόσωπάκι. Μπορεί το άλλο να διάλεγα τώρα [P.C.].*
'The other one looks like a face. Perhaps I would choose the other one now [P.C.].'

(4)   B: *Αυτήν; [με έκπληξη] Μ'αρέσει η φάτσα της.*
'*Her?* [surprized] I like her face.'
A: *Γιατί το είπες έτσι; Αμφιβάλλεις;*
'Why did you say it like that? Do you doubt it?'
B: *Ναι, νομίζω οτι διάλεξα αυτήν [P.C.].*
'Yes, I think I chose this one [P.C.].'
A: *Α, νομίζεις; Μπορεί να μπέρδεψα τις κάρτες. Πες μου γιατί νομίζεις πως διάλεξες αυτήν;*
'Oh, you think? Maybe I mixed up the cards. Tell me then why do you think you chose her.'
B: *Δεν ξέρω ποιά διάλεξα. Δε θυμάμαι. Αυτή [P.C.] είναι πάντως πιο ωραία από την άλλη.*
'I don't know who I picked. I don't remember. She is anyway [pointing to P.C.] prettier than the other one.'

(5)   B: *[Παύση] Και 'δω θα διάλεγα αυτήν αν το ξανασκεφτόμουν [P.C.]. Έκανα λάθος [A: οκ] είναι πιο συμπαθητική απ'αυτήν.*
[Pause] 'Here too, I would have chosen her, if I could think it over [P.C.]. I did a mistake [A: ok] she is nicer than her.'

(6)   B: *Κι αυτή είναι πιο χαμογελαστή απ'την άλλη [P.C.]. Πιο...Ή όχι. Δεν ξέρω [A: καμιά φορά όταν τις ξαναβλέπουμε] νομίζω ότι θα διάλεγα αυτήν [A: οκ] αν ξαναγινόταν το τεστ.*
'She is also smiling more than the other one [P.C.]. More…Maybe, not. I don't know [A: sometimes when we see them again] I think I would choose her [A: ok], if we could rerun the test.'

The final level includes the responses that were coded as non-detected. The categories here were those of *Ignorance, Indifference*, and *Acceptance*. In the first one, the participants either did not justify the M.C. at all, as in example (7), or they did so reluctantly (8). In the second category,

the participants evaluated both of the alternative cards as choices of equal weight (9). Finally, in the *Acceptance* category, the participants spontaneously provided motivations for the M.C., as in example (10).

(7)   B: *Δεν ξέρω. Γιατί ήταν…Δεν ξέρω. Πώς έτσι μου βγήκε αυτό τώρα. Δεν έχω συγκεκριμένο λόγο.*
'I don't know. Because he was...I don't know. How did it come to me like that…I have no specific reason.'

(8)   B: *Ούτε εδώ μπορώ να…Αυτό...δε θυμάμαι καν να τους είδα αυτούς τους δυο. Δεν...Δε θυμάμαι να τους είδα, ίσως το μαλλί, το χτένισμα, το στυλ του, το στυλ του.*
'Here as well I can't…This…I don't even remember seeing these two. I don't…I don't remember seeing them, maybe his hair, the haircut, his style, his style.

(9)   B: *[Παύση] Αυτό…[παύση] Δε μ'άρεσε κανένα και είπα απλά αυτό {γελώντας}.*
'[Pause] 'This one...[pause] I didn't like either of them and I just said this one {laughing}.

(10)   B: *Μ'άρεσε το σχήμα του.*
'I liked its shape.'

3.3. Detailed hypotheses

The theoretical background and general hypotheses of the previous section led to the formulation of the following more specific hypotheses against which the results were assessed:

- H1: The detection level of the manipulation will be higher for the remembered choices than for the non-remembered choices.
- H2: The detection level of the manipulation will be higher for the more consequential choices than for the less consequential ones.
- H3: The detection level of the manipulation will be higher for the choices with higher affective valence (and pictoriality) than those with lower affective valence (and pictoriality).

The three hypotheses may be said to constitute a meta-hypothesis, which can be considered supported if the first and at least one of the last two hypotheses find support.

- META-HYPOTHESIS: Memory influences (the detection of) manipulation blindness and choice-awareness.

4. Results

The results are presented on the basis of descriptive statistics, reserving the presentation of the inferential statistics for the end (Section 4.4). Table 4 shows all the responses to manipulated trials, and their proportions of the total number.

Table 4. Response type of manipulated trials, total = 316

TYPE OF DETECTION	TYPE OF RESPONSE	NUMBER OF RESPONSES (%)
Clear	Categorical	68 (21%)
	Conciliatory	37 (12%)
	Retrospective	2 (1%)
Possible	Uncertainty	46 (15%)
	Ignorance	29 (9%)
	Indifference	25 (8%)
None	Acceptance	109 (34%)

The responses were almost equally divided between *Detection*, when including *Clear* and *Possible Detection* (49%), and *No Detection* (51%). The detections consisted predominantly of *Categorical* responses (21%). Amongst the *No Detection* responses, the majority were categorized as cases of *Acceptance*; however, a third (33%) of the total *No Detection* responses belonged to the categories of *Ignorance* and *Indifference*. This rather mixed stance towards *No Detection* may be argued to indicate a degree of manipulation awareness, expressed implicitly either by participants' ignorance in acknowledging and justifying the manipulated choice as their own, or by treating both alternatives as indifferently "equal", as part of a forced choice task (see Section 5.1.2).

4.1. H1: Detection of manipulation and memory

According to H1, the following correlation was expected: the better remembered the original choices were, the more participants would detect their manipulation. Figure 3 illustrates the detection rates of manipulations for the remembered (R) and misremembered (M) choices.
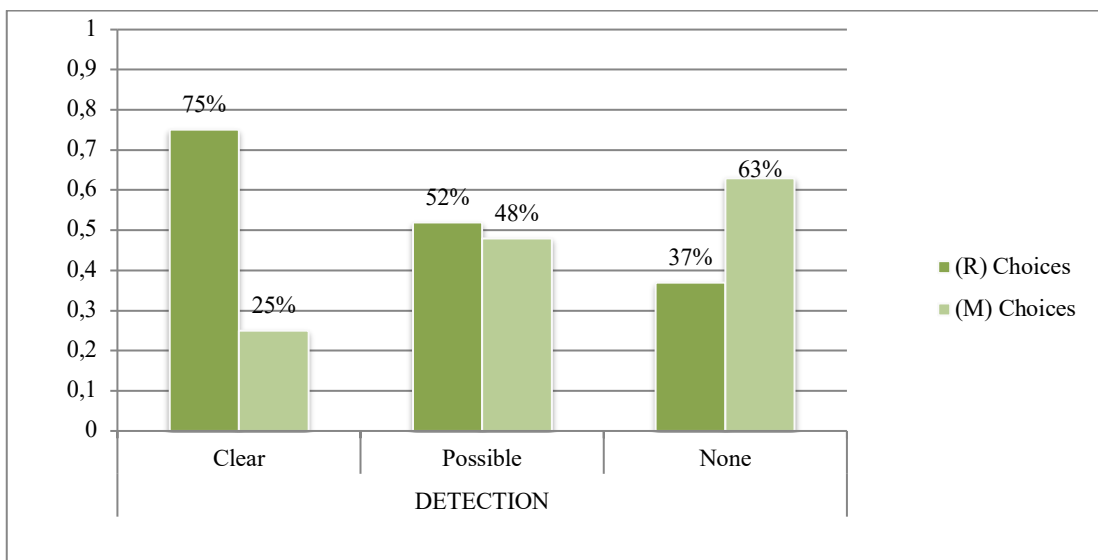
Figure 3. Detection of manipulation for Remembered (R) and Misremembered (M) choices

As expected, a clear majority (75%) of the *Clear Detection* cases concerned choices that participants had remembered correctly in Step 2 of the task (see Section 3). Almost as a mirror image to this, in the case of *No Detection*, the misremembered choices predominated. For *Possible Detection* the rate was fairly equal for both remembered and misremembered choices, suggesting that even when participants remembered making the original choice, they were often still open to

the possibility of error on their behalf, since the experimenter's "expertise" was rarely openly questioned. Conversely, even when participants misremembered, they could sometime still feel that something was "wrong" with the presented choice, expressing it with their uncertainty. However, since the *Possible Detection* rate was equal for both remembered and misremembered choices, and for an easier analysis of the results, only the *Clear Detection* will be considered (separately) for the rest of the Section.

The large and significant (see below) difference between the rates of detection for remembered and misremembered choices supported H1, the main hypothesis of the study, concerning a positive correlation between memory and detection of the choice manipulation.

4.2. H2: Detection of manipulation and consequence

H2 concerned the role of choice-consequence for the detection of manipulation, and indirectly (especially given the support for H1) for the memory of choice. Figure 4 shows the *Clear Detection* divided by the type of task (more or less consequential) for both the remembered (R) and misremembered (M) choices.
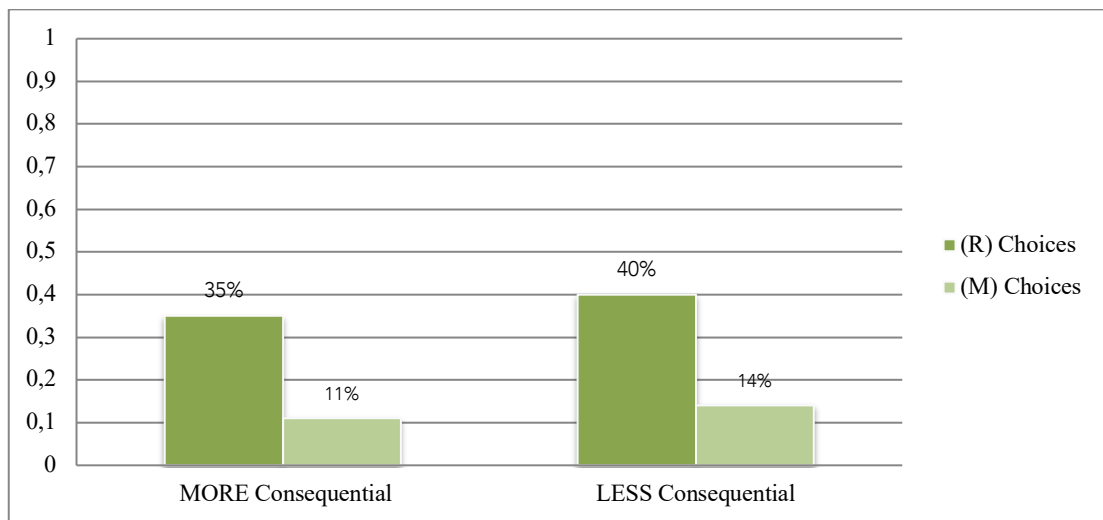

Figure 4. Detection of manipulation per type of choice for (R) and (M) per the factor consequentiality

Figure 4 shows that the proportions of the detections in the two conditions for the factor consequentiality were fairly equal, and so were the proportions of remembered (R) and misremembered (M) choices in each condition, indicating that in the current experiment, participants' detection of manipulation was not influenced by the (high or low) consequentiality that the different tasks assigned. Thus, it can be concluded that H2 was not supported.

4.3. H3: Detection of manipulation and affectivity

H3 examined the way different degrees of abstractness, based on stimuli with high/low affective valence and pictoriality, may influence the detection of choice manipulation (and the remembering of a choice). Figure 5 shows the sum of *Clear* detections, according to different types of stimuli for both the remembered (R) and misremembered (M) choices.
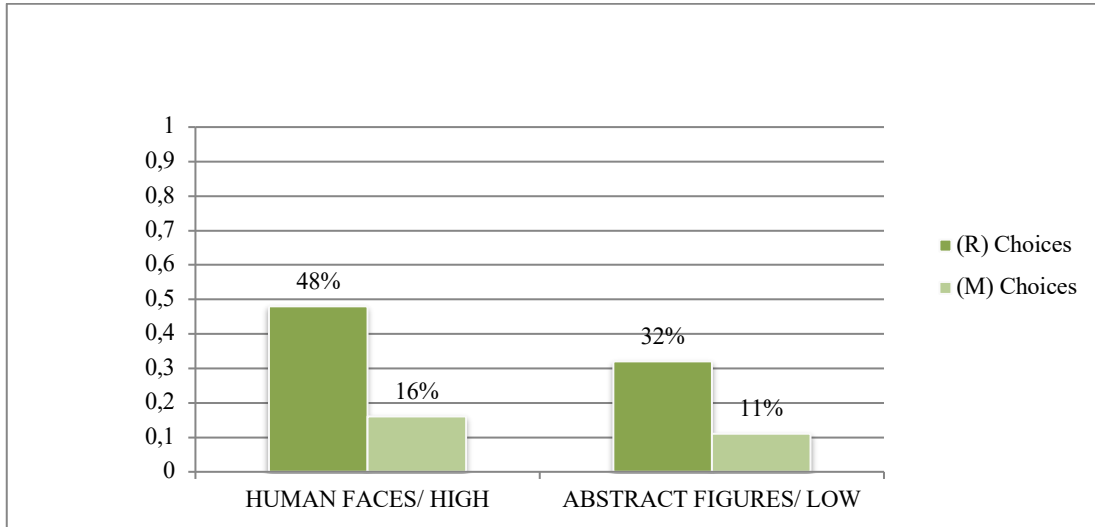
Figure 5. Detection of manipulation per stimulus for (R) and (M) per the factor affectivity (and pictoriality)

As Figure 5 displays, the rates of detection for the stimulus with higher affective valence and pictoriality (64%) were higher than those with low valence/pictoriality (43%). Thus, as expected, participants' detection of manipulation depended on the degrees of affectivity, and/or pictorial nature of the visual representations. Furthermore, the distribution between (R) and (M) choices in the two conditions was also statistically significant (see Section 4.6). These results accordingly support H3.

4.4. Statistical difference of detection in H1-H3

Table 5 concentrates the results of the statistical analyses for all the hypotheses. Where the difference is statistically significant, the figures are given in bold face. The results are the estimate of the effect (EST), its standard error (SE), the z-value, and the p-value.

Table 5. Statistical effects on detection in manipulated responses in H1-H3.

	EST	*SE*	*Z*	*p*
Intercept	*-2.5107*	*0.4649*	*-5.400*	*0.000*
H1 Memory	*2.1566*	*0.3556*	*6.065*	*0.000*
H2 Consequence	*0.4094*	*0.3096*	*-1.322*	*0.186*
H3 Affectivity	*0.9705*	*0.3175*	*3.056*	*0.002*

The differences in proportions in Table 5 indicate that the factors memory and affectivity predict (in statistical terms) detection and that the detection of manipulation for H1 and H3 could not be due to chance. However, this was not the case for Consequence (H2). More specifically, when looking at the positive values of the estimated effects (EST) it can be seen that the likelihood that a manipulation is detected increases if the stimulus is remembered. SE estimates show the amount of uncertainty associated with the effect estimates, and as p values indicate, the likelihood of this is small for memory and affectivity predictors, but not for consequence.

5. Discussion

5.1. The role of memory in detection

The results of the empirical study indicate a parallel between the types of detection (Clear and Possible, see Table 4) and the two levels of choice discussed in Section 2 (Categorial and Operative) with their correlation to explicit and implicit memory. It is thus possible that the latter provide participants with different amount of certainty in expressing detection, and consequently result in the resistance to or acceptance of manipulation. This suggests that different ways of remembering, as well as various other factors (e.g. experimenter's authority, way of manipulation, participants' individual characteristics) influence the expression of detection and as such, they need to be acknowledged prior to any concluding remarks about the role of memory in manipulation blindness.

The higher level of categorial intuition accounts for deliberate choices that involve ideas and reasons that may be explicated with language. When participants recall a choice of this kind, they pinpoint and express their reasoning during the process of choice-making, and on the basis of this they defend or reject the presented choice. This type of deliberate choice and explicit way of remembering creates more certainty in defending their choices, which is expressed relatively clearly. Hence, it is likely that the more explicitly participants remembered making a choice, the "clearer" the type of detection, which is supported by the rate of 75% of *Clear Detection* for remembered choices. Example (11) demonstrates the way participants express detection by recalling and explicating their choice-process.

(11) B: *Α, μήπως διάλεξα αυτήν; [P.C.] [A: μπορεί, μπορεί] Ναι, τώρα εδώ μήπως διάλεξα αυτήν, θυμάμαι... [A: οκ, γιατί;] Γιατί μου κάνει κάτι σαν Αφρικάνα, ξέρεις [P.C.]. Αυτήν πρέπει να διάλεξα, βασικά [P.C.].*
'Oh, perhaps I picked her? [pointing at P.C.] [A: perhaps, perhaps] Yes, now here, perhaps I picked her [pointing to P.C.]. **I remember… [A: ok, why?] Because to me she seemed like an African,** you know [P.C.]. I must have chosen this one, basically [P.C.].

According to the phenomenology-based theory presented in Section 2, our more spontaneous choices based on impressions and impulses derive from the lower level of operative intentionality, a form of bodily awareness that precedes explicit understanding. This level acts rather paradoxically: it gives participants the implicit awareness (the "felt certainty") that something is "wrong" with what is presented to them, but deprives them of the explicit certainty of remembering making the choice or not. Their type of response to detection is thus likely to be more hesitant and unsure. The equal rates of remembered and misremembered choices of *Possible Detection* (Section 4, Figure 3) indicate just that: for the remembered choices, participants' detection may stem from explicitly recalling their choices – yet expressing it with uncertainty under the influence of other factors (see Subsection 5.1.1 below). For the misremembered choices, meanwhile, participants may acknowledge something erroneous, but in the lack of explicit memory they adopt a hesitant and unsure way of expressing detection. The following two examples (12-13) are indicative of *Possible Detection* for a remembered and misremembered choice, respectively:

(12) B: *Αυτό διάλεξα [M.C.]?*
'Is this the one I chose [M.C.]? '
A: *Δεν ξέρω, όχι; [παύση] Μπορεί να μπέρδεψα τις κάρτες.*
'I don't know. Didn't you? [pause] Maybe I mixed up the cards.'
B: *Ναι. Νομίζω πώς αυτό είχα διαλέξει [P.C], αλλά τέλος πάντων [A: γιατί;] γιατί; γιατί είναι λίγο αστείο αυτό [M.C.] δεν ξέρω κιόλας αν το διάλεξα αλλά μου φαίνεται λίγο αστείο με τις βουλίτσες αυτές εδώ. Από τη μια πάει να σε τρομάξει και από την άλλη είναι λίγο*

αστείο. **'Yes. I think I chose that one [P.C.], but anyway** [A: why?] why? Because this is a bit funny [M.C.] I don't know if I chose it but it looks funny with these dots here. It's about to scare you but at the same time it's funny.'

A: *Ενώ αυτό; [P.C.]*
'And this one?' *[P.C.]*
B: *Αυτό κάνει τη δουλειά του. Είναι πιο αφηρημένο.*
'This is how it's supposed to be. It's more abstract.'

(13) B: *Τη διάλεξα αυτή, ε; και δε διάλεξα την άλλη;*
'I did choose this one, ha [M.C.]? and I didn't choose the other one [P.C.]?'
A: *Δεν ξέρω. Μπορεί να έχω κάνει λάθος εγώ.*
'I don't know. Maybe *I* did something wrong.'
B: *Δε θυμάμαι. Μου βγάζεις πάντα αυτή πιο μπροστά [δείχνοντας M.C.], αλλά νομίζω πως θα διάλεγα αυτήν είναι πιο ομορφούλα [P.C.].*
'I don't remember now. You always show me this one further ahead, but I think I would choose the other one [P.C.], she is prettier [P.C.].'
A: *Μπορεί να μπερδεύτηκα εγώ.*
'Maybe I got confused'
B: *Ναι, όχι. Δε θυμάμαι και εγώ τώρα τι έκανα σ' αυτό.*
'Yes, no. I don't remember now about this one.'

In both examples, participants first question the presented choice. In the case of explicit remembering (12), *as soon as* the researchers suggests the possibility of a mistake on their behalf, the participant consents to it and expresses the thinking behind choice-making for the preferred choice. In (13), however, the participant without the "assistance" of explicit memory expresses detection hesitantly *despite* the researcher's suggestion that it could be her "fault". The previous examples suggest that detection (and its expression) is influenced by the different types of remembering and imply that other factors in combination with memory should be acknowledged, as discussed in the following sub-section.

5.1.1. Second-person method

A common phenomenon observed in the study was the dependence of (the expression of) detection on specifics of the social interaction, as shown by the adopted 2nd-person method. The experimenter's dialogical stance aimed to weaken the role's authority, allowing participants to express detection of manipulation more freely. The assessment of the manipulated responses provided some indicative patterns in this regard, supported with the following examples.

The participants largely relied on the legitimacy of the experiment, assuming that what was presented to them was accurate. In the face of doubt, the (expression of) detection changed. Notably, examples (14-15) were coded as *Clear/Conciliatory Detection* for remembered choices.

(14) B: *Μ' άρεσε πιο πολύ [M.C.]. Εσύ μου έδειξες σίγουρα αυτά που έχω διαλέξει, έτσι; Δεν μπορεί να μου δείξεις άλλο.*
'I liked it more [M.C.]. You definitely showed me what I've chosen, right? You can't possibly show me otherwise.'
A: *Δεν ξέρω...μπορεί να έχω κάνει μπέρδεμα–*
'I don't know, maybe I mixed something up–'
B: *Επίτηδες μπορεί να το έχεις κάνει το μπέρδεμα [A: μπορεί να-] γιατί βλέπω ότι κάποια δεν τα έχω διαλέξει και λέω γιατί–*
'You might have mixed up something on purpose [A: it might be that–] because I see that I haven't chosen some of them–'
A: *Ε, να το εκφράζεις τότε άμα νομίζεις ότι–*
'Feel free to express if you think that–'

B: *Γιατί έχει γίνει σε κάνα δυο, όταν σου είπα ότι δεν το διάλεξα, το άλλο είχα διαλέξει*
'Because it happened with one or two, when I told you that I didn't choose this one, I had chosen the other one.'
A: *Ναι, εκείνο...ούτως ή άλλως όλα γράφονται–*
Yeah, that…anyhow everything is recorded–
B: *Και τώρα, αυτό διάλεξα [δείχνοντας P.C.], δε διάλεξα αυτό [M.C.].*
'And now, I chose this one [pointing to P.C.], not that one [M.C.].'
A: *Διάλεξες αυτό [P.C.];*
'You chose this one [P.C.]?'
B: *Ναι.*
'Yes.'

(15)   B: *Σαν αρουραίοι; [M.C.] [παύση] Αυτοί είναι πιγκουίνοι* [P.C.] *[παύση]*
'Like rats? [M.C.] [pause] These are penguins [P.C.] [pause]'
A: *Οκ*
'Ok.'
[pause]
B: *Ναι, δεν ξέρω. Μ'άρεσε πιο πολύ;*
'Yeah, I don't know. I liked it better?'
A: *Περίμενε, γιατί αν αυτοί είναι αρουραίοι και αυτοί είναι πιγκουίνοι– [γέλιο]*
'Wait, because if these are rats and these are penguins–[laughter]'
B: *Μήπως διάλεξα τους πιγκουίνους; Τί παθαίνω με τους πιγκουίνους και τις μπαλαρίνες; [παύση]. Μπορεί να σκεφτόμουν ότι ήθελα να πω αυτό, και να είπα τελικά αυτό.*
'Maybe I picked the penguins? What's going on with me and penguins and ballerinas? [pause] **I might have thought I wanted to say this one [P.C.], but I eventually said that one [M.C.].'**
A: *Οκ.*
'Ok.'
B: *Και στη μπαλαρίνα της μιας τα πόδια ήταν πιο ίσια, μήπως είπα εκείνη;* [P.C.] *[γέλιο]*
'And to the ballerina [referring to the previous manipulated trial], the one who had her legs straight, did I maybe say that one [P.C.] [laughter]?'
A: *Πολύ πιθανό...ρε συ ναι φυσικά γιατί είναι πολλές οι κάρτες και όταν τις ξαναφτιάχνω...εμένα με ενδιαφέρει σ'αυτό το βήμα η αιτιολόγηση της επιλογής, όχι δεν έχει να κάνει–*
'It's possible…you know yes because the cards are too many and when I redo them...but at this step, what is important is to justify your choice, so it doesn't have to do with–'
B: *Τα πιγκουινάκια ήταν. [P.C.]*
'It was the penguins. [P.C.]'

In example (14), the participant spontaneously accepts the manipulated choice and then immediately questions it. When the researcher suggests a potential mistake from their side, the detection is expressed clearly. If the researcher's reply had firmly supported the presented choice as accurate, the participant more likely would not have *expressed* the detection despite being aware that something was wrong with the presented choice. In (15), the participant detected that something was wrong, but expressed it more firmly only after the researcher suggested the possibility of a mistake with the cards. In similar examples, participants *after questioning the card themselves* show surprise at the possibility of a cards mix up by expressions such as, "Could it be so?", "Is this possible?", etc., followed then by the rejection of the manipulated choice and the justification of the preferred one. These cases show that although participants apparently remembered their choices, their type of response was partly influenced by the interaction with the researcher.

Overall, participants expressed their trust and confidence in the experimenter's role (as "expert" who conducts the task accurately). This trend was so strong that in some cases they were

eager to acknowledge the "inconsistency" as their own fault. Examples (16-17) indicate this pattern of *Clear Detection* for both a remembered and misremembered choice.

(16) B*: Χμ, τώρα που το σκέφτομαι πρέπει να διάλεξα εκείνο. [P.C.]*
'Hm, now that I think about it, I must have chosen that one [P.C.]. '
A: *Ναι; Μπορεί εγώ να μπερδεύτηκα [B: Όχι] είναι πολλές οι κάρτες–*
'Yeah? I might have got confused. **[B: No]** There are too many cards– '
B: *Όχι, όχι, μεταξύ τους... αυτό είναι καλύτερο. Ε...[παύση] όχι.*
'No, not, between them…this is better [M.C.]. Em…[pause] no.'
[uncomfortable pause]
A: *Αλλά όμως αν διάλεγες αυτό [P.C.] θα το διάλεγες γιατί…*
'So, if you chose that one [P.C.], you would choose it because…'
B: *Ναι, είναι πιο εύκολο. Γιατί παραπέμπει σε πιο πολλά πράγματα [P.C]. Αυτό είναι πολύ συγκεκριμένο [M.C.].*
'Yes, it's easier. It alludes to more things [P.C.]. This one is too specific [M.C.].'

(17) B: *[Δείχνοντας P.C.] Αυτή διάλεξα.*
[pointing to P.C.] 'I chose her.'
A: *Α, Αυτή διάλεξες; σόρρυ.*
'Oh, you chose her? I'm sorry.'
B: *Νομίζω.*
'I think.'
A: *Μπορεί να μπέρδεψα τις κάρτες.*
'Maybe I mixed up the cards.
B: *Όχι, νομίζω, δε θυμάμαι.*
'No, I think, I don't remember.'
A: *Συμβαίνει καμιά φορά...πες μου γιατί διάλεξες αυτή τότε [P.C]*.
'It can happen sometimes...tell me why you chose this one then [P.C.].'
B: *Χωρίς λόγο, νομίζω. Δε θυμάμαι. Εσύ ξέρεις καλύτερα.*
'No reason, I think. I don't remember. **You know better.'**

In both examples, the participants are aware that something is wrong with the choice presented to them, but the experimenter's role influences detection: in (16) the participant changes his initial answer from the preferred card to the manipulated one in an effort to *accept* the manipulated choice *after* the researcher acknowledged it as her potential mistake, while in (17) the participant hesitates to attribute the inconsistency to the researcher by proclaiming the uncertainty of accurate recalling. The same pattern (of trust) was identified in *Possible Detection* responses for both remembered and misremembered choices in (18).

(18) B: *Ποιον διάλεξα; Αυτόν διάλεξα [M.C.], δε διάλεξα αυτόν [P.C.];*
Who did I choose? I chose this one [M.C.], not the other one [P.C.]?
A: *Μισό λεπτό, θεωρείς ότι διάλεξες αυτόν [P.C.], μπορεί να μπερδεύτηκα εγώ.*
'One sec, you think you chose this one [P.C.], maybe I was confused–'
B: *Όχι, επειδή βάζεις αυτόν πάντα που έχω διαλέξει–*
'No, because you always present to me the one, I chose from this side–'
A: *Ναι, αλλά όμως επειδή είναι πολλές οι κάρτες μπορεί να μπερδεύτηκα, αν νομίζεις ότι διάλεξες το άλλο να μου αιτιολογήσεις αυτό.*
'Yeah, but because the cards are so many, I might have mixed them up, if you think you chose the other one, explain your motivation for that one.'
B: *Δε θυμάμαι τί διάλεξα, γιατί απάντησα στη μνήμη ότι πρέπει να διάλεξα αυτόν [P.C.], αλλά τώρα που βλέπω κι αυτόν δε θυμάμαι τι διάλεξα.*
'I don't remember which one I chose, because I answered in the memory step that I chose this one [P.C.] but now that I see him, I don't remember which one I chose.

A: Ok
'Ok'
[uncomfortable pause]
A: *Γιατί διάλεξες αυτό ή αυτό, τί κριτήρια σκέφτηκες–*
'Why did you choose this one or that one, or what criteria did you consider–'
B: *Κακώς, αν διάλεξα αυτόν [M.C.], θα ήθελα να το αλλάξω [P.C.].*
'No matter if I chose this one [M.C.], I would like to change it [P.C.]'

Examples (14-18) show that participants expect that the experimenters are reliable, conducting the task based on a consistent system.

The significance of social interaction for (the expression of) detection is obvious in the previous examples. The extensiveness of this pattern, however, should not come as a surprise when considering the essential phenomenological notion of *empathy*. The importance of face-to-face interaction is emphasized by the phenomenologist Emmanuel Levinas in his reflections on ethics, as a component of subjectivity. For Levinas, subjectivity is constituted by our concern and responsibility towards others, which comes prior to choice and cognition, almost as an intrinsic impulse. He argues that in the presence of others our self-righteousness is questioned (Levinas, 1969). In this mode, face is an "authority without force" (1998, p. 169), opening up transformative possibilities for ourselves and the ways we relate to each other. Seeing conversation as an ethical relation, as Levinas proposes, helps understand the way in which participants exceed the limits of their selfhood, reach out and meet the other halfway, either by not expressing objection to the suggested choice, or by taking the "blame" upon themselves.

5.1.2. No Detection

It should be reminded that *No Detection* does not equal *Acceptance*, since it includes *Ignorance* and *Indifference* as participants' response patterns. These patterns could possibly be seen as subtle ways of resisting manipulation, since participants do not explicitly detect the manipulation, but neither do they accept it. With *Ignorance* participants either did/could not provide arguments to support the manipulated choice (19-20) or did so after first stating their ignorance.

(19) B: *Δεν ξέρω. Γιατί ήτανε...Δεν ξέρω πώς έτσι μου βγήκε αυτό τώρα. Δεν έχω κάποιο συγκεκριμένο λόγο.*
'I don't know. **Because he was...I don't know** how it just came to me like that. I have no specific reason.'

(20) B: *Άβυσσος [παύση]. Δεν ξέρω. Έτσι μάλλον.*
'No idea. [pause]. I don't know. **Just because, I guess**.'

In *Indifference* participants evaluate the choices as of equal weight (stating that they like/dislike both alternatives) (21), or as random, meaningless choices, part of a forced task (22).

(21) B: *Αυτό...δε μ' άρεσε κανένα και απλά είπα αυτό.*
'This one...**I didn't like either of them and I just said this one**.'

(22) B: *[...] αναγκαστικά επέλεξα αυτή. Δε θα διάλεγα καμία σε άλλη περίπτωση δηλαδή άμα ήταν να μην επιλέξω καμία δε θα διάλεγα καμία. Δε θα τις έπαιρνα μαζί.*
'**Necessarily**, I chose her. **I wouldn't choose any of them under another circumstance,** if I was to choose any, I wouldn't. I wouldn't take them with me.'

Participants' responses of *Acceptance* were at times assertive, providing arguments to explain the manipulated choice as in (23), but sometimes their responses were rather confusing as in (24)

going back and forth between the two alternatives, arguing for the [P.C.] and/or against the [M.C.], yet accepting the manipulation.

(23)   B: *Πεταλούδα. Αυτό προσπαθούσα να βγάλω.*
        '**Butterfly**. That's what I was trying to get.'

(24)   B: *Ε, αυτή λίγο [P.C.] …κάτι, γιατί έχει…τα χαρακτηριστικά της δεν είναι τόσο ισορροπημένα [pointing to P.C.], μ' άρεσε [δείχνοντας Μ.C.], αν και χαμογελάει βέβαια [δείχνοντας P.C.] και γι' αυτό μπορεί να το σκεφτόμουν κιόλας [δείχνοντας εναλλάξ τις κάρτες] γιατί μ' αρέσει όταν χαμογελάν [P.C.], αλλά…οκ…μπορεί…[παύση] έτσι να είναι τα χείλη της, να είναι προς τα κάτω και να χαμογελάει και αυτή. Αυτή. [Μ.C.]*
        'Eh, this one [P.C.] is a bit…something, because…her facial characteristics are not that balanced [pointing to P.C.], I like [pointing to M.C.], although she is smiling of course [pointing to P.C.] and this is why I might have been thinking about it [pointing back and forth to both cards] because I like it when they smile [P.C.], **but…ok…maybe…[pause] that's the way her lips are, going downwards but smiling too**. Her. [M.C.]'

At some responses, as in (25), participants seemed to provide an argument that was thought up instantly, or stating with comments, such as "That's it"; "Now it struck me".

(25)   B: *Αυτό μου θύμισε μια μπαλαρίνα [Μ.C.] αλλά και το άλλο μια μπαλαρίνα [P.C.], γιατί το διάλεξα [παύση] ναι, μου φάνηκε πιο ολοκληρωμένη εικόνα, δηλαδή ότι έχει κεφάλι, χέρια, ενώ αυτό είναι σαν ακέφαλο. Τώρα το θυμήθηκα.*
        'It reminded of a ballerina [M.C.] and so did the other one [P.C.], a ballerina, why did I choose it [pause] yes, the image seemed more complete, meaning that it has a head, hands, while the other one is headless. **I remembered it just now.**'

The examples of *Acceptance* responses here discussed exhibit that participants provided justifications for the manipulated choices, as they were instructed. Such justifications are characterized by CB researchers as "confabulations". However, under the present cognitive semiotic approach the issue is more complex.

5.2. The role of affectivity (and pictoriality)

Affectivity (combined with pictoriality) played a significant role in remembering and manipulation detection. Influenced by the affective load and pictorial representation of human faces, many participants linked what was presented to them to a pre-existing "setting", relating to people in the real world and their personal experiences, as in examples (26-27). The pattern of their responses to ink blots, on the contrary, was seen as an effort to connect what was given to them to something else that was not immediately present, but was not in their proximate environment either, (28-29).

(26)   B: *Σίγουρα δε διάλεξα αυτήν. [Μ.C] [A: όχι;] Αυτήν διάλεξα [P.C.]*
        'For sure I did not choose her. [M.C.] [A: didn't you?] I chose the other one [P.C.].'
        A: *Μπορεί να μπέρδεψα εγώ τις κάρτες. Γιατί;*
        'I might have mixed up the cards. Why?'
        B: *Γιατί; Πιο συμπαθητική μου φαίνεται, μου θυμίζει λίγο την Μέγκαν Μαρκλ [A: ποιά είναι αυτή, δεν την ξέρω] που παντρεύτηκε τώρα τον πρίγκιπα και μου φαίνεται πολύ συμπαθητική η κοπέλα, μπορεί γι' αυτό.*
        'Why? Because she looks nicer, **she reminds me of Meghan Markle** [A: who is she? I don't know her] she got married to the prince and **that girl looks very nice to me**, maybe that's why.'

(27) B: *Όχι, νομίζω διάλεξα αυτόν [P.C.].*
'No, I think I chose the other one [P.C].'
A: *Οκ, γιατί;*
'Ok, why?'
B: *Γιατί αυτός [M.C.] μου θυμίζει έναν πρώην...πραγματικά μου θυμίζει έναν πρώην, αλήθεια σου λέω [γέλιο] πάρτον να μην τον βλέπω, αυτόν διάλεξα σίγουρα [P.C.].*
'Because this one [M.C.] **reminds me of an ex... indeed he reminds me of an ex, honestly [laughter] take him away, I don't want see him**, I chose that one for sure [P.C.].'

(28) B: *Γιατί; μ' άρεσε πιο πολύ αυτή η μουτζούρα, απ' την άλλη.*
'Why? **I liked this smudge more than the other one.**'

(29) B: *Και αυτό μπορείς να πεις ότι είναι ένας άνθρωπος που χορεύει, ενώ αυτό δε δείχνει τίποτα.*
'And this one you can say that **it's a dancing man, while the other one shows nothing**.'

It may be observed that for both kinds of stimuli, participants tended to use their subjective experiences, biases, interests and temperamental factors as "tools" for drawing analogies between stimulus and experience. For the less affective and less pictorial stimulus, this approach was not that efficient, since the stimulus appeared "meaningless" and in need of a greater effort on their behalf to attribute meaning to it, in order to respond to the situation, they have been given. In this case, participants recruited their imagination, struggled more, and were at times more analytical in their descriptions. For the human faces, on the other hand, their pre-existing experiences provided an easier and more certain way to respond to manipulation, leading to more detections. As Bartlett (1932, p.213) argues, memory is personal exactly because it "depends upon an interplay of appetites, instincts, interests and ideals peculiar to any given subject", justifying participants' tendency to remember and detect manipulations of choices with higher affective valence.

5.3. The role of consequence

As shown in Section 4.2, it made no difference for the detection of manipulations whether the manipulated choice concerned an abstract figure regarded as a potentially permanent tattoo or as just aesthetically pleasing. Would we not, however, react strongly if a real-life tattooist gave us the wrong design, or if a person who repelled us showed up as our date for the evening? "Consequence" in the current experiment was based on the presupposition that participants would engage themselves in the imaginary situation assigned to them, reflect upon the alternatives, and choose accordingly. This supposition, however, could not be controlled, and in retrospect, it is not that surprising that the factor did not have a reliable effect. Yet, it seemed that participants who took the instructions to "imagine" more earnestly in the two tasks, pondering an actual impact on their choices, more often detected manipulation, as in (30).

(30) B: *Ήμουν ανάμεσα σε αυτές τις δυο και το σκέφτηκα πολύ και δε θυμάμαι τελικά νομίζω πάλι πήρα αυτή [P.C.] επειδή την είδα, αυτή μ' άρεσε [M.P.] μετά λέω σ' ένα νησί τί θα κάνω μ' αυτήν και πήρα αυτήν που είναι πιο ευχάριστη [P.C.]. Άμα ήταν να επιλέξω ανάμεσα στις δυο μάλλον θα έπαιρνα την άλλην [M.C.] αλλά με προβλημάτισε ότι θα έπρεπε να τις πάρω στο νησί.*
'I was between those two and **I thought hard about it** and I don't remember. Eventually I think I picked that one again [P.C.], because I saw her more, I liked her [M.C.], but then **I thought what would I do on an island** with her so I picked the more pleasing one. **If I was to choose between them more likely I would choose the other one [M.C.], but concerning the island I was troubled.**'

5.4. "Confabulation"

The terminological revision from *choice* blindness to *manipulation* blindness (see Section 2.6) reflects two different perspectives: the cognitivist and the phenomenological. On the one hand, mainstream cognitive science takes "blindness phenomena" to be an essential part of our normal cognitive functioning; similarly, "blindness" to choice implies unreliable agents who essentially lack any awareness of their choices. On the other hand, phenomenology suggests a more complex conception of manipulation blindness, encompassing a variety of factors that may influence our conscious, embodied nature, while acknowledging different degrees of awareness in choice-making.

It seems that conventional cognitive science approaches manipulation blindness similarly to any other cognitive process, and detection as a specific process with predetermined characteristics: participants are expected to preserve and recall their choices, detect manipulation, and exhibit variation between manipulated and non-manipulated reports; when they do not, they are considered "blind" (e.g. Johansson et al., 2005, 2008). This is reminiscent of the following description offered by Bartlett (1932, p.187):

> We take processes like recognition, or recall, and draw a line round [them] by saying that, for instance, there is recognition when, an object being re-presented, we feel, or judge or "know" it to be old. We then try to explain this feeling, judgment, or knowledge by some discriminable peculiarity of the processes, which go on within the boundary line that we have drawn.

However, Bartlett (1932) has shown that such "modules" are, in the very least, unrealistic, since "not everything that has been perceived is, as a matter of fact, recognized or remembered" (p.188). Based on the general agreement of the numerous observations of his experiments, Bartlett argues that cognitive processes do not "abide" by our expectations or predictions, since in remembering, literal recall was always rare, and in recognition, comparison and judgment were rare too; even when "favorable conditions" in perception are provided, "[…] listening, seeing, observing, and specific attitudes are subject to change and check" (p.194). The adaptation of Bartlett's (1932) experimental results and theory of remembering in the present research could help expand the rather limited ways of looking at "blindness" phenomena and could possibly account for the hitherto insufficient explanation of the phenomenon. The two basic arguments of CB (e.g. low detection rates and confabulated arguments, and homogeneity for both types of reports) are undoubtedly indicative experimental observations of choice manipulation; however, when assessed under the prism of phenomenology and cognitive semiotics, their discourse against the reliability of introspection and lack of choice awareness displays a rather "monodimensional" perspective: Participants were asked to respond to the assigned task and in order to satisfy that need, they justify "choices" they did not make. These kinds of responses, however, should not necessarily be considered to be fabricated, and in this sense false, but rather part of each individual's selfhood, possibly resulting from reflections on who they would have been if they had indeed made that choice. In their effort to respond adequately to what was expected from them (while being under the influence of social interaction), participants have adapted the initial question ("why did you choose this one?") to "why would you have chosen it?", thinking about how they could be different if they were to act in a certain way (Sokolowski, 1990). The intertwined basic acts of consciousness (Subsection 2.1.1) may have provided the flexibility of a fuller perception of both the intended "object" and the perceiver's identity that were developed together, allowing participants to discover new ways of experiencing both things and themselves. Hence, participants could have projected their future self to the present situation, casting around for features consistent to the sedimented structures of their past experience, and as a result, express explanations that accorded with their selfhood.

Surely, some of them were "blind" to the manipulation, since they did not notice the switch or object to the manipulated choice. However, even when they "confabulated", they were at least

potentially subjected to their personal quest for reason and truth in the specific situation they were facing, which turns the "fictitiousness" of their responses to the "text that … various forms of knowledge attempt to translate into precise language" (Merleau-Ponty, 2012, p. 1xxxii).

6. Conclusions

The present article examined the phenomena of choice awareness and manipulation blindness, the latter a more adequate term for what is known in the literature as "choice blindness" and aimed to provide a conception of these phenomena that would not dichotomize between conscious and unconscious, intuition and observation. The factors of memory, consequence, and affectivity were examined, implying that if these factors were found to influence the detection of manipulation, then we could argue for different *degrees of choice awareness*.

The first research question concerned whether memory for choice plays a significant role in manipulation blindness. It was expected that participants' detection of manipulation would be higher for the choices they remember making than for those they did not, which indeed was the case for the majority of detections. Moreover, the interpretation of the results in regards to memory and detection suggested that memory, with its different ways of remembering (implicit/explicit), influenced radically the expression of detection: the more explicitly participants remembered making a choice, the clearer their response was, becoming more hesitant and uncertain for the non-remembered choices. This pattern was parallel to the proposed two-level model of choice-making. In short, the lower level of operative intentionality accounts for the more spontaneous and implicit choices; the higher level of categorial intuition for the more deliberate ones. Furthermore, the specifics of social interaction (as shown by the adopted 2nd-person method) was identified as a key factor in detection: empathy, authority, "ethics" (in the sense of responsibility toward the other), and the intersubjective manner of our being in the world were all essential in deciding whether and how participants expressed the detection of choice manipulation.

The significance of social interaction in choice-manipulation blindness should be addressed in future research in a wider range of contexts. By adopting, for example, both an authoritative and an empathetic approach, their different influence on detection could be tested for a fuller conception of the phenomenon. A related limitation of the current experiment, and potentially of all manipulation blindness experiments, is the way detection is "measured", since detection would seem to require more implicit methods than what have been used so far (Fazio and Olson, 2003). As shown in Sections 4 and 5, detection involves verbal responses, but also a wide range of gestures, facial expressions, intonation, pauses, etc. The ways these elements could be evaluated in order to constitute a more complete framework of measuring detection is a topic for the future.

The second research question examined whether consequence of choice would affect remembering and detection of manipulation. Although the results do not suggest that consequentiality had a large influence on detection, the way consequence was studied as a factor in the experiment, was not sufficient to draw firm conclusions. This is because it was assumed that participants would engage with the different instructions of the tasks (more/less consequential) and make their choices by imagining or placing themselves in hypothetical scenarios, which is not something that could be controlled for. Thus, a future study could focus on more effective ways for testing the role of consequentiality for choice memory and manipulation detection.

The third and final research question enquired about the role of affectivity in recall and detection, which was shown to be a significant factor in explaining the results. The stimuli presumed to have higher affective valance, the photos of the human faces, were also those that were more pictorial. Thus, it may be concluded that affectivity and pictorial consciousness assisted participants in assessing the stimuli through the pre-existing "settings" of their actual experiences. If participants lacked these, they tended to try and attribute value to what was at first rather meaningless to them, influencing detection accordingly. In future research these two factors

– affectivity and pictoriality – could be decoupled in order to be examined separately to check in which way each one influence detection.

The methodological approach of first-person, second-person and third-person method triangulation adopted by this research exemplifies the way in which cognitive semiotics could come to contribute to theoretical concepts like choice and memory, furthering them to become richer by means of the conceptual-empirical loop. In combination with phenomenology, cognitive semiotics understands different kinds of intentionalities (perception, remembering, and imagination) in their interconnection, in contrast with the understandings of these in terms of mechanisms and algorithms within standard cognitive science. By broadening the spectrum of the latter, which regards "blindness" as a normal part of human cognition and participants as ignorant decision makers, with the pluralistic objectivity of former, a more ample conception of the phenomenon of choice may be obtained. This approach acknowledges the occasional "blindness" to manipulation as a phenomenon that occurs under the influence of a number of factors, and, on this basis, it suggests the re-examination of the conception of participants as unreliable beings that confabulate arguments. It rather proposes to regard them, or rather: us, as conscious agents with different degrees of choice awareness. Even if, in the full range of our actions, we fail to be "truthful", we are still prone to achieve it due to our nature as beings with empathy and veracity.

Acknowledgements

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Appendix I. Stimuli pairs: Human faces and abstract figures
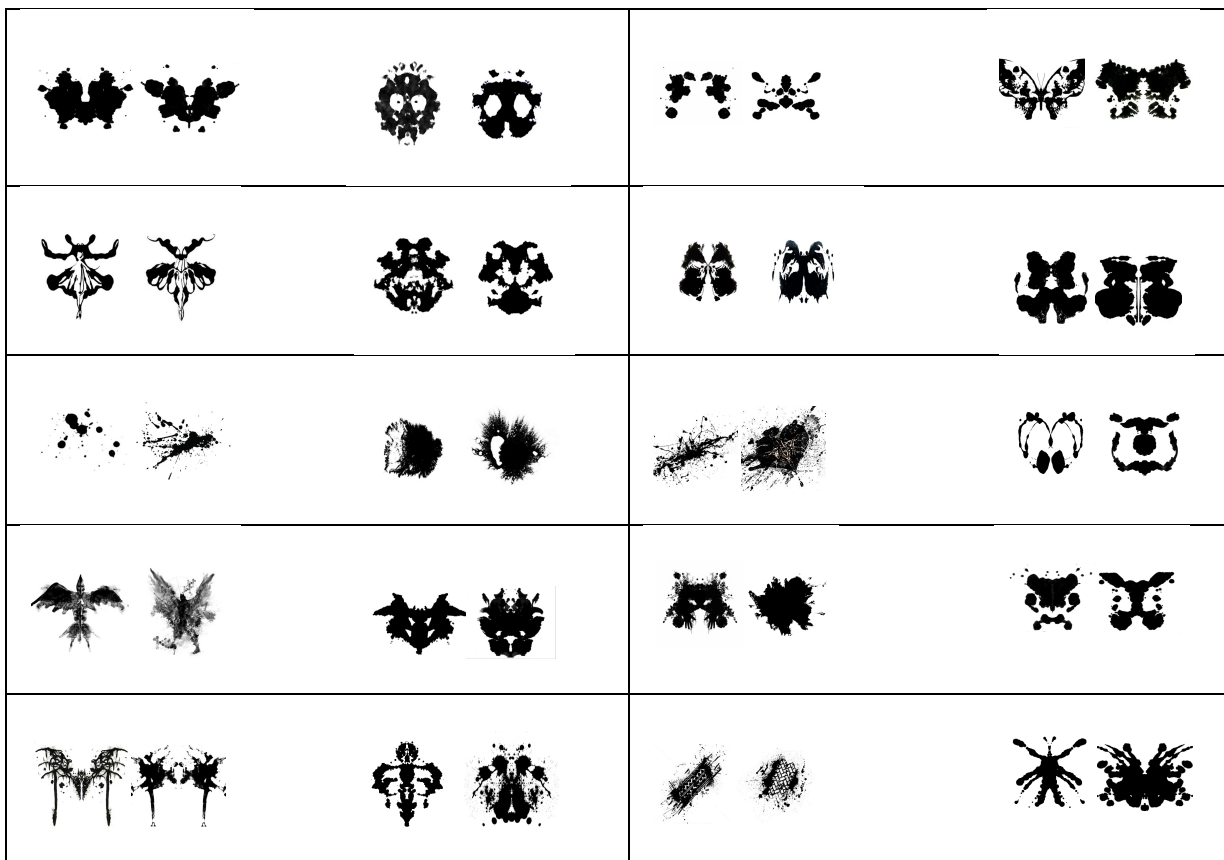
Appendix II. Participants' instructions Group 1(a, b) and Group 2(a, b)

EXPERIMENT INSTRUCTIONS

Thank you for agreeing to be part of this study. You are about to participate in a choice-making experiment involving memory and at the end of the session you will be awarded with a thank-you note and feedback on your performance. There is no time limit, but the overall procedure is estimated to take roughly 60 minutes. Please remember to turn off your cell phone. If you have a question or problem at any point during the experiment, please feel free to voice it.

GROUP 1(a)

The experiment will consist of two parts. In each part you will be shown a different type of pictures, and you will make your choice based on a different question. Each part has four steps. You are allowed to talk during the whole procedure, and if anything is unclear at any point of the task, please feel free to say so. A short break will take place between the two parts.

PART 1:

Question: "Who do you find more attractive"?

You will be presented with 20 pairs of pictures of male and female faces. For each pair you need to show with your index finger the one you find more attractive (Step 1). Once you are done, some randomly selected choices of yours will be presented to you and you will be asked to confirm them as such (Step 2); in case you are unsure, you can make a guess. Following, you will watch a very short film of roughly 5 minutes (Step 3). Finally, you will view the initial pairs of pictures and you will be asked to motivate your choices (i.e. to say why did you chose the one you did) (Step 4). You can take as much time as you need in order to decide upon your choices, view them, and/or provide the motivations for them. The first three picture-pairs that will be presented to you are for practice, in order to familiarize you with the task, and are not included in the total 20.

SHORT BREAK (optional)

PART 2:

Question: "If you were to get an ink tattoo, which of the figures would you choose?"

You will be subject to the same procedure as in the first part, only this time you will be presented with 20 pairs of photos of abstract figures and you will be asked to choose the one you would pick if you were to get an ink tattoo. Again, for each pair you need to show with your index the one you prefer (Step 1). Once you are done, some randomly selected choices of yours will be shown to you and you will be asked to confirm them as such; in case you are unsure, you can make a guess (Step 2). Following you will watch a very short film of roughly 5 minutes (Step 3). Finally, you will view again all of the initial pairs of pictures and you will be asked to motivate your choices (i.e. to say why did you chose the one you did) (Step 4). You can take as much time as you need in order to decide upon your choices, view them, and/or provide the motivations for them. The first three picture-pairs that will be presented to you are for practice, in order to familiarize you with the task, and are not included in the total 20.

DEBRIEFING:

After the tasks are completed you will be asked a few questions about your experience in participating in the experiment and you will have the chance to raise any questions or concerns.

Relax and enjoy the process!

EXPERIMENT INSTRUCTIONS

Thank you for agreeing to be part of this study. You are about to participate in a choice-making experiment involving memory and at the end of the session you will be awarded with a thank-you note and feedback on your performance. There is no time limit, but the overall procedure is estimated to take roughly 60 minutes. Please remember to turn off your cell phone. If you have a question or problem at any point during the experiment, please feel free to voice it.

GROUP 1(b)

The experiment will consist of two parts. In each part you will be shown a different type of pictures, and you will make your choice based on a different question. Each part has four steps. You are allowed to talk during the whole procedure, and if anything is unclear at any point of the task, please feel free to say so. A short break will take place between the two parts.

PART 1:

Question: "If you were to get an ink tattoo, which of the figures would you choose?"

You will be subject to the same procedure as in the first part, only this time you will be presented with 20 pairs of photos of abstract figures and you will be asked to choose the one you would pick if you were to get an ink tattoo. Again, for each pair you need to show with your index the one you prefer (Step 1). Once you are done, some randomly selected choices of yours will be shown to you and you will be asked to confirm them as such; in case you are unsure, you can make a guess (Step 2). Following you will watch a very short film of roughly 5 minutes (Step 3). Finally, you will view again all of the initial pairs of pictures and you will be asked to motivate your choices (i.e. to say why did you chose the one you did) (Step 4). You can take as much time as you need in order to decide upon your choices, view them, and/or provide the motivations for them. The first three picture-pairs that will be presented to you are for practice, in order to familiarize you with the task, and are not included in the total 20.

SHORT BREAK (optional)

PART 2:

Question: "Who do you find more attractive"?

You will be presented with 20 pairs of pictures of male and female faces. For each pair you need to show with your index finger the one you find more attractive (Step 1). Once you are done, some randomly selected choices of yours will be presented to you and you will be asked to confirm them as such (Step 2); in case you are unsure, you can make a guess. Following, you will watch a very short film of roughly 5 minutes (Step 3). Finally, you will view the initial pairs of pictures and you will be asked to motivate your choices (i.e. to say why did you chose the one you did) (Step 4). You can take as much time as you need in order to decide upon your choices, view them, and/or provide the motivations for them. The first three picture-pairs that will be presented to you are for practice, in order to familiarize you with the task, and are not included in the total 20.

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GROUP 2(a)

The experiment will consist of two parts. In each part you will be shown a different type of pictures and you will be asked to make your choice based on a different question. Each part has four steps. You are allowed to talk during the whole procedure, and if anything is unclear at any point of the task, please feel free to say so. A short break will take place between the two parts.

PART 1:

Question: "Which figure do you find more aesthetically pleasing?"

You will be presented with 20 pairs of pictures of abstract figures. For each pair you need to show with your index finger the one you find more aesthetically pleasing (Step 1). Once you are done, some randomly selected choices of yours will be presented to you and you will be asked to confirm them as such (Step 2); in case you are unsure, you can make a guess. Following you will watch a very short film of roughly 5 minutes (Step 3). Finally, you will view the initial pairs of pictures and you will be asked you to motivate your choices (i.e. to say why did you chose the one you did) (Step 4). You can take as much time as you need in order to decide upon your choices, view them, and/or provide the motivations for them. The first three picture-pairs that will be presented to you are for practice, in order to familiarize you with the task, and are not included to the total 20.

SHORT BREAK (optional)

PART 2:

Question: "If you were to be on a deserted island and could only take one person with you, who would you choose?

You will be subject to the same procedure as in the first part, only this time you will be asked to choose between 20 pairs of photos of male and female faces the one you would take with you if you were on a desert island. Again, for each pair you need to show with your index the one you prefer (Step 1). Once you are done, some randomly selected choices of yours will be presented to you and you will be asked to confirm them as such; in case you are unsure, you can make a guess (Step 2). Following you will watch a very short film of roughly 5 minutes (Step 3).Finally, you will view again all of the initial pairs of pictures and you will be asked you to motivate your choices (i.e. to say why did you chose the one you did) (Step 4). You can take as much time as you need in order to decide upon your choices, view them, and/or provide the motivations for them. The first three picture-pairs that will be presented to you are for practice, in order to familiarize you with the task, and are not included to the total 20.

DEBRIEFING:

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GROUP 2(b)

The experiment will consist of two parts. In each part you will be shown a different type of pictures and you will be asked to make your choice based on a different question. Each part has four steps. You are allowed to talk during the whole procedure, and if anything is unclear at any point of the task, please feel free to say so. A short break will take place between the two parts.

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SHORT BREAK (optional)

PART 2:

Question: "Which figure do you find more aesthetically pleasing?"

You will be presented with 20 pairs of pictures of abstract figures. For each pair you need to show with your index finger the one you find more aesthetically pleasing (Step 1). Once you are done, some randomly selected choices of yours will be presented to you and you will be asked to confirm them as such (Step 2); in case you are unsure, you can make a guess. Following you will watch a very short film of roughly 5 minutes (Step 3). Finally, you will view the initial pairs of pictures and you will be asked you to motivate your choices (i.e. to say why did you chose the one you did) (Step 4). You can take as much time as you need in order to decide upon your choices, view them, and/or provide the motivations for them. The first three picture-pairs that will be presented to you are for practice, in order to familiarize you with the task, and are not included to the total 20.

DEBRIEFING:

After the tasks are completed you will be asked a few questions about your experience in participating in the experiment and you will have the chance to raise any questions or concerns.

Relax and enjoy the process!

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About the Author
Alexandra Mouratidou has an MA in Language and Literature, with specialization in Cognitive Semiotics, from Lund University. The present work derives from her master's thesis project. She continues to be interested in phenomenology and consciousness, from the perspective of cognitive semiotics, and in particular in the phenomenon of choice-making.