

**PHD THESIS SUMMARY:**  
**Choice Architecture: A Message and Environment Perspective**

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Contrary to standard theories of decision making, which posit that preferences are invariant across logically equivalent choice scenarios, experimental evidence shows that even theoretically irrelevant aspects of a decisional context can affect choices (for an overview, see Shafir 2013, especially Part 8). For instance, food choice may be affected by the prominence or order of items on display, whereby those that are more prominently displayed may draw the consumer's attention and be selected in response (e.g., Dayan and Bar-Hillel 2011). The idea that supposedly irrelevant features of the choice context matter for the final decision is encapsulated in the concept of 'choice architecture', that is, the way in which a choice situation is 'designed' and presented to the decision maker (Thaler and Sunstein 2009; Thaler, Sunstein, and Balz 2013). More specifically, a choice architecture includes not only the options available and the budget constraint, but also the options' order and prominence, the way in which they are described to the decision maker (e.g., if information is framed in positive or negative terms), the presence of default options, the rules or norms that govern the decision, and so on. Given the plethora of aspects that form a choice architecture (and that can affect the final decision), decision theorists and policy makers have strived to advance models and frameworks to analyze and design choice architectures (e.g., Johnson et al. 2012; Thaler, Sunstein, and Balz 2013; Lades and Delaney 2022).

In my doctoral thesis, I join this endeavor by advancing a framework which conceptually subdivides choice architecture into two dimensions: 'Message' and 'Environment'. Roughly speaking, 'Message' refers to the verbal description of options (both oral and written) and information or suggestions about the choice at hand, while 'Environment' refers to every element that the decision maker can find in her physical or virtual surroundings, perceive through her senses, and interact with. The core idea is that a choice situation may be designed by working on these two dimensions and that choice behavior depends on how either dimension is

designed in relation to the other. Ultimately, I argue that analyzing and designing choice architectures through the Message-Environment distinction allows for a fruitful, novel perspective on choice behavior and policy making. This idea is laid out in three chapters.

Chapter 1 (published as Congiu and Moscati 2022) reviews the literature on choice architecture, with particular attention to so-called ‘nudges’ (Thaler and Sunstein 2009). Nudges are broadly defined as aspects of the choice architecture that steer people’s behavior in welfare-improving directions by acting on their cognitive limitations and biases (Thaler and Sunstein 2009; Hansen 2016). An intense debate has flourished around the concept of nudge, focusing on three main themes: (1) the exact definition of a nudge; (2) the justification for the use of nudges in policy making; and (3) the effectiveness of policies based on nudges. On the first theme, the chapter argues that, based on the existing definitions of nudge, it is not always straightforward to separate nudges from other tools for behavior change, such as standard policies (e.g., taxes and other monetary incentives) and marketing techniques (e.g., prominently displaying expensive products). With respect to the justification issue, the chapter clarifies that ‘pro-self’ nudges, that is, those that aim to increase the nudged person’s welfare, can be adequately justified by ‘libertarian paternalism’—an approach to policy making that authorizes steering people’s behavior in directions that improve their welfare while preserving choice freedom (Thaler and Sunstein 2009). By contrast, ‘pro-social’ nudges, which aim to increase society’s welfare (sometimes at the expense of the nudged person), are not adequately justified by libertarian paternalism and call for alternative justifications for their use (e.g., approval by the public). Finally, the chapter shows that nudge policies can be as effective as standard policies (and in some cases even more effective), although the two should be regarded as complements rather than substitutes.

The Message-Environment framework is introduced in chapter 2 (published as Congiu and Moscati 2020). As anticipated, the framework decomposes choice architecture into two dimensions: Message and Environment. The Message dimension includes all verbal communications, both oral and written, that describe the choice situation or provide some information about it. Examples are messages such as ‘Smoking damages the lungs’ that attempt to influence people’s behavior by targeting their motivation to preserve their well-being, and ‘Suggested donation: £10’ which

aims at establishing a reference level or ‘anchor’ for donations. The Environment dimension includes all elements of the choice context that the decision maker can encounter in her physical or virtual surroundings, perceive through her senses, and interact with. Among others, the Environment includes the way the options are ordered or displayed (e.g., items on a shelf) and the presence of constraints (e.g., budget constraints), obstacles (e.g., speed bumps), or default options (e.g., double-sided printing). The framework is then applied to analyze some common types of nudges, and specifically to identify a Message and an Environment counterpart for each. For example, it is argued that anchors can be provided at Environment, such as when donors are provided with a list of potential contributions (e.g., {€1, €2, €5, ...}), but also at Message, through communications such as ‘Limit of 10 per person’ or ‘How many units do you usually buy?’ Finally, the Message-Environment framework is applied to the analysis of Amazon’s website (i.e., a digital choice architecture) and to the design of a fictitious choice architecture to foster saving for retirement.

Chapter 3 (published as Congiu 2022) applies the distinction Message-Environment to the architecture of a choice involving risk, namely, an elicitation task for risk aversion. Typically, risk aversion is elicited experimentally by presenting the decision maker with a menu of monetary lotteries with varying risk and asking her to choose the lotteries she prefers. On their part, lotteries can be presented through a verbal description stating the outcomes and their likelihood (e.g., ‘Win \$5 with probability 10%’, ‘1/10 chance to win \$5’)—that is, they have a Message dimension—and can be accompanied by a pictorial display, such as a pie chart or bar graph—that is, they have an Environment dimension. The literature on risk communication suggests that alternative but logically equivalent numeric formats (e.g., percentages vs. ratios) and pictorial displays (e.g., continuous vs. discrete graphs) may frame risk in a way that alters the perception of it (e.g., Schapira, Nattinger, and McHorney 2001). Thus, I design a multiple price list task (Holt and Laury 2002) where risk information is presented at Message as percentages (‘10%’) or ratios (‘1 out of 10’) and at Environment as a pie chart sliced either in two or ten slices. Results show that neither the Message framing (adopting ratios) nor the Environment framing (slicing pies) significantly altered the average elicited risk aversion. However, the pictorial framing significantly reduced the elicited risk aversion of those participants who focused on the probability of the high outcome in their decisions, suggesting that the impact

of the pictorial framing may depend on which probability in a choice under risk draws the most attention.

In conclusion, the Message-Environment framework has as its core the idea that choice architecture can be decomposed into a Message and an Environment dimension, and that choice behavior depends on the way in which these dimensions are designed with respect to one another. An important implication is that an intervention in the choice architecture can be in principle more effective if Message and Environment are designed in a complementary way. For instance, a message discouraging the adoption of a certain conduct—e.g., ‘Free-riding damages the group output’—can be more effective if combined with an obstacle or constraint to the adoption of that conduct—e.g., a system that detects and punishes free-riding with a given probability. Likewise, an intervention at Environment might be less effective without a complementary one at Message, because without proper communication decision makers might not understand the importance of exhibiting a particular behavior. To continue the example provided above, group members might be more prone to avoid free-riding if they understand the implications of their actions for the group output rather than just focus on avoiding being caught by the system. Ultimately, the Message-Environment framework prompts the ‘architect’ of a choice situation to investigate potential complementarities between the two dimensions, generating in turn more effective interventions.

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