

ARTICLE

Transparency and nudging: an overview and methodological critique of empirical investigations

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Abstract

Transparency is intimately linked to debates about the ethics, political legitimacy and effectiveness of nudging. This paper provides an overview of empirical studies investigating how changes in the transparency of a nudge affect people's choices and evaluations of the nudge. I conclude that the present literature provides generally consistent evidence supporting that the effectiveness of a nudge does not decrease when choosers are given good opportunity to detect and understand the influence it might have on their choices. However, several conceptual and methodological issues are identified, significantly limiting the scope of the conclusions that can be drawn. The limitations are discussed and organized into six themes, with recommendations provided for how future research may address them.

Keywords: nudging; choice architecture; transparency; disclosure; policy; manipulation

A benefit of traditional public policy instruments is that their applications in society tend to be *transparent*. The implementations of regulatory (bans), financial (taxes and incentives) or information-based (information campaigns) measures are generally publicly disclosed, individuals tend to know in what situations they are applied, and how the tools aim to influence them.

Nudges, however, and similar behaviorally informed interventions¹ (hereafter 'nudges' for short; Thaler and Sunstein, 2008; 2021), have on occasion been considered not sufficiently transparent. In principle, there is no reason why applications of nudges and individuals' knowledge thereof need be less clear than that of traditional instruments. However, it is true that at least some nudges, engaging psychological mechanisms that can be hard to introspect about, may influence choosers in ways less obvious to them.

A perception of nudges as lacking some form of transparency is central to influential objections to, or concerns about, nudges as policy tools. One such line of

¹See Nova and Lades (2022) for a typology.

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criticism is ethically oriented and focuses on manipulation and autonomy. If a nudge lacks transparency and operates outside of the chooser's awareness, its influence may be considered manipulative and therefore a threat to the decision maker's autonomy (e.g., Hansen and Jespersen, 2013; Wilkinson, 2013; Ivanković and Engelen, 2019; Schmidt and Engelen, 2020). A second line is political. In democratic societies, citizens expect being able to scrutinize openly available information about the means and ends of the government. If nudging happens non-transparently, its legitimacy may be called into question (e.g., John, 2018; Thaler and Sunstein, 2021, pp. 326–328). A third line of criticism has doubted whether common nudges are effective when choosers know about them, proposing that the behavior change potential of nudges rests on a lack of transparency. The concern is captured by the seminal quote that nudges 'work best in the dark' (Bovens, 2009, p. 13), with the understanding that the more transparent – 'the less effective these techniques are' (p. 13).

The theoretical discussions on transparency and nudging have recently inspired interest from scholars wishing to put these assertions to the empirical test. Do ethical and political appeals for transparency stand in the way of nudges as successful behavior change tools? This paper reviews the empirical literature concerned with providing an answer. In the following, I first provide a brief exposition of the empirical results. Next, I highlight several methodological issues that limit what conclusions can be drawn at present. Recommendations for how to address them in future studies are offered. A final section concludes.

Empirical findings about transparency and nudging

There are several routes one can take to increase transparency about a nudge. Different reasons for increasing transparency can also require that different aspects about the nudge are made salient (an issue returned to later). Policymakers may, for instance, decide to disclose the general use of nudges in public records but leave it open whether people are able to spot individual cases. Or they may embrace a 'here-and-now approach' and aim to make nudges transparent to choosers at the time of exposure (cf. type vs token interference transparency, Bovens, 2009). How transparency is ensured in the latter case is an open question. For instance, it could be accomplished by providing a disclosure statement (i.e., putting up a sign with information about the nudge).

In fact, almost all behavioral studies have manipulated transparency in this way: by providing (vs not providing) a message explicitly informing choosers about the nudge.

In the following review of the literature, the focus will be on outlining main outcomes and general study characteristics. The brief-but-broad approach serves to provide the background for a following methodological discussion. This discussion will challenge the dominant conclusion of the empirical studies: that increasing transparency does not change the outcomes of nudge interventions.

Among the empirical studies, the largest group of experiments concern default nudges applied in consequential (real stakes) choices. Here, the effects of message-induced transparency have been tested with charity donations (Bruns *et al.*, 2018; Michaelsen *et al.*, 2020, 2021a; Gråd *et al.*, 2021), agreement to extra low-

paid/unpaid work in research studies (Steffel *et al.*, 2016; Michaelsen *et al.*, 2021b, experiment 1b; Paunov *et al.*, 2019a, 2019b, 2020; Wachner *et al.*, 2020, 2021; 2022; van Rookhuijzen *et al.*, 2023) and food choices (Steffel *et al.*, 2016, experiment 1c; notably the only field experiment in this category). Gråd *et al.* is the sole study reporting increased transparency to reduce the impact of the nudge, with a drop from 62% to 50% of participants partly donating a 50¢ bonus to charity. The studies by Paunov *et al.*, most of which test several disclosure messages, and van Rookhuijzen *et al.*, report at least one message increasing compliance with the nudge. All other studies in this category failed to find a significant influence from increased transparency on choices.

Transparency about defaults has also been studied in hypothetical (stake-less) choice experiments concerning end-of-life treatments (Loewenstein *et al.*, 2015), sharing of personal data (Steffel *et al.*, 2016; Dranseika and Piasecki, 2020) and choices of environmentally friendly apartment amenities (Steffel *et al.*, 2016; Michaelsen *et al.*, 2021a) and elective university courses (Paunov *et al.*, 2019a). In an apartment acquisition scenario, Steffel *et al.* (experiment 2a) found that the presence of a disclosure decreased choices of luxury (but not pro-environmental) amenities. Otherwise, no effects of transparency were found on participants' choices.

A handful experiments have studied other nudges than defaults. Gråd *et al.* (2021) found no influence from disclosure of a social norm or a moral appeal nudge in an experiment on charitable giving. Zhuo *et al.* (2023) studied a list order salience nudge (products displayed in order of carbon footprint) to encourage green consumption, with the same result. Two field studies on healthy food choices also report null effects for salience nudges (placement of products; Kroese *et al.*, 2016; Cheung *et al.*, 2019). Cheung *et al.* also found no influence from a disclosure statement when a social norm nudge promoted healthier snack choices. Kantorowicz-Reznichenko *et al.* (2022) similarly found no transparency effects on a social norm or two information salience nudges in a vaccination intention study (the nudges were, however, not increasing intentions to begin with). Kantorowicz-Reznichenko and Kantorowicz (2021) did, however, find a decrease in the effectiveness of a disclosed social norm nudge in a stylized lottery choice experiment where the nudge encouraged choosing the high-risk/high-payoff lottery.

Apart from its influence on choices, another research focus has been on how changes in transparency influence people's evaluations of nudges. In the survey literature, where people judge descriptions of nudges without engaging in choices, the general finding is that overt interventions are considered more acceptable than less overt ones (Felsen *et al.*, 2013; Jung and Mellers, 2016; Reisch and Sunstein, 2016; Sunstein *et al.*, 2017; Davidai and Shafir, 2020; Gold *et al.*, 2020). For instance, Jung and Mellers found higher support for a policy where employees were provided information about the benefits of enrolling in a basic medical plan than for a policy of a default enlisting in the same plan.

Behavioral studies, where participants engage firsthand in a choice task, have found more mixed results. For instance, Michaelsen *et al.* (2021a, study 3) found no effect from increased transparency on how much participants objected to the choice format. Similarly, choice experiences, such as of autonomy and satisfaction, have been found unaltered (Wachner *et al.*, 2020; 2021; Michaelsen *et al.*, 2021a).

Other studies have tested whether transparency increased perceptions of the nudge as pressuring or manipulative, finding no (Bruns *et al.*, 2018; Wachner *et al.*, 2020; Gråd, *et al.*, 2021; Michaelsen *et al.*, 2021a, study 2) or minor increases (Michaelsen *et al.*, 2021a, study 3). Some studies looked at reputational effects for implementers of nudges ('choice architects'). Among these, some found no influence from proactive transparency (Paunov *et al.*, 2019a; Michaelsen *et al.*, 2021b, study 1), and others that perceptions deteriorated when people learned about the nudge after the fact (Steffel *et al.*, 2016, experiment 2b; Michaelsen *et al.*, 2021b, study 2). Paunov *et al.* (2019a, 2019b, study 2) also found that (proactive) transparency may lead to increased feelings of being deceived, but the result failed to replicate in a subsequent study (Paunov *et al.*, 2019b). Notably, and differently from the survey studies, all of these studies focused solely on default nudges.

Methodological limitations and how they may be addressed

The literature thus generally concurs on transparency not obstructing the effectiveness of nudges. However, a number of methodological issues challenge the generality of the conclusion. These include conceptual matters such as what purpose transparency is intended to serve, how transparency is operationalized and what criteria decide whether a nudge is 'transparent'. They also include matters at the level of study design, such as risks of confounding effects, of demand effects and method invariance at several levels. Together these suggest a verdict on whether 'nudges work best in the dark' might be premature, or at least that any present-day statement needs to be complemented with significant caveats.

I next discuss these issues organized into six themes and provide recommendations for how to address them in future research. To my knowledge, no single study is free from all issues raised, and most are affected by several.

Problem 1: Operationalizations of transparency lack correspondence

Transparency about a nudge can mean several things,² and perhaps unsurprisingly, transparency-enhancing messages in the literature contain a wide range of content. One mapping of the research literature suggests no less than nine separate aspects of transparency being disclosed (Bruns and Paunov, 2021). At the conceptual level, different reasons for promoting transparency (e.g., ethical or political) may favor transparency about different details. At the practical level, resulting operationalizations may differ both within and between different purposes. Accordingly, there is a risk of research findings being comparable only in name. To develop a cumulative body of evidence transparency, researchers must talk about the same thing or acknowledge when not.

Let us take an example. The dominant backdrop in empirical studies has been the ethics of nudging, with transparency conceived as a countermeasure to manipulation (and thereby protection of autonomy). The philosophical treatment of manipulation

²For instance, it can mean that choosers are able notice the nudge, understand its purpose, why the purpose is promoted, who is implementing the nudge, why the nudge is chosen over another intervention or what psychological mechanisms are activated by it.

is longstanding and rich (Coons and Weber, 2014). Generally, however, the term revolves around interference with choosers' conscious decision-making processes and (lack of) respect for rational deliberation capacity (Wilkinson, 2013). To mitigate manipulation so understood, and facilitate free and independent deliberation about the choice at hand, at least two senses of transparency about nudges seem relevant for choosers to know: (1) that a nudge aiming to influence their behavior is present and (2) to what aim the nudge attempts to influence them (e.g., toward more pro-environmental choices) (cf. Bovens, 2009; Hansen and Jespersen, 2013). If these criteria are accepted, notable cases in the literature are not ethically informative (regarding manipulation) since sufficient information is not disclosed to choosers.³ Arguably, some other cases could themselves be manipulative from containing *too much information* in the form of pressuring phrasings of the disclosure messages (cf. Problems 2 and 4).

To improve knowledge accumulation, future research ought to explicate the purpose transparency aims to fulfill and how the operationalization achieves this end. Similarities and differences in results could fruitfully be discussed in light of studies' differences in operationalizations. The practical demands of transparency will vary with its intended purpose. However, from the perspective of counteracting manipulation and protecting autonomy, a proposal for what core aspects are relevant is offered above.

Problem 2: Nudge disclosures confound transparency with message features

While their contents may vary, disclosure statements as the primary means of increasing transparency have been firmly established. Yet, such messages introduce methodological confound problems. Adding a disclosure statement is a multifaceted act that could influence choosers in several ways and not only ways related to the transparency of the nudge. For instance, choosers might react to other parts of the message than intended: to features of the message delivery (e.g., tone, timing and placement), or simply to the act of providing the message at all. Influence from any of these elements blurs the contribution from transparency *per se*. Instead, a shift may occur where the psychological decision-making process is dominated by increased or decreased sympathy for the choice architect, or similar. In a sense, providing a disclosure statement turns the intervention into a 'double nudge', with the disclosure potentially adding unique or multiplicative effects on behavior and experiences. As an empirical illustration, consider a study by Paunov *et al.* (2020). The study re-examined a disclosure statement from a previous study on transparency and nudging (Paunov *et al.*, 2019b) and found the message to have a separate impact on behavior, nominally greater than the default nudge itself. With nudge and disclosure statement combined, the impact increased further.

Disentangling the constituent drivers of transparency effects is vital for theoretical understanding and extrapolation beyond known cases. Future research would benefit from developed theorizing on the moderators of transparency effects, and, once more, from greater reflexivity concerning operationalizations used. Researchers may also

³Of course, mitigating manipulation as per the criteria here proposed was not necessarily the intention of these studies.

consider other means to manipulate transparency than by means of messages (cf. Problem 6). For instance, transparency can be manipulated through increasing the ‘internal’ salience of the nudge (makes it stand out), or from exposing choosers to different choice architectures, effectively disclosing nudges ‘from experience’ (cf. Bang *et al.*, 2020, study 2). An altogether different approach is to direct research focus toward applied behavioral problems where confound issues may be acceptable as long as impact is achieved.

Problem 3: Differences in transparency are rarely established

When evaluating if nudges ‘work best in the dark’, how should we conceive of the darkness? One could view transparency as arbitrated by objective features of the nudge or by subjective outcomes. On the objective account, transparency can be settled on theoretical grounds. For instance, one could consider a particular nudge not transparent, but that adding a disclosure statement makes it so. On the subjective, transparency is an empirical matter and decided by whether choosers successfully identify the nudge.⁴ Policymakers might (have to) settle for the former, but many interesting research questions, such as relating to perceptions of transparency and nudging, likely require the latter.

Whether or not there is a subjective difference between ‘transparent’ and ‘non-transparent’ nudges also casts the null effects for choice outcomes in different lights. If enough people do not notice or understand ‘transparent’ nudges better – this could explain why their effectiveness do not change. In fact, the scarce data available suggest participants often do fail to comprehend nudge disclosures supposed to increase transparency. Several studies find correctness levels around or below 50% in manipulation checks with simple multiple-choice alternatives (Wachner *et al.*, 2020; Michaelsen *et al.* 2021a, 2021b; Zhuo *et al.*, 2023; but see also Paunov *et al.*, 2022).⁵ Correspondingly, null findings for transparency are not surprising if participants are able to also identify the ‘non-transparent’ version of the nudge. That risk is also non-negligible as the transparency literature relies heavily on online/lab studies with highly ‘prompted’ choice tasks. Presumably, these serve to make unexpected choice architecture salient to choosers. For instance, a study by Dhingra *et al.* (2012) found that 71% of their student sample noticed a ‘non-transparent’ default, and that most identified it as an influence attempt (see also Jung *et al.*, 2018; McKenzie *et al.*, 2021). In the two studies by van Rookehuizen *et al.* (2023, see appendix 2), about one-third of participants noticed that a choice option had been preselected (subjected to a default nudge). Numbers rose to almost 60% when a disclosure pointed out the preselection – still indicating, however, that the difference in subjective transparency can be far from profound even in terms of basic identification of the nudge.

Objective and subjective approaches to transparency inform different research questions. Clarifying one’s position can mean an important improvement in

⁴Several ethicists have favored an in-between account, requiring that sufficiently attentive and knowledgeable observers should be able to identify the nudge (Bovens, 2009; Ivanković & Engelen, 2019).

⁵Paunov *et al.* (2019a, study 2) also report having assessed disclosure comprehension but do not report the outcome separately. Combined for three checks however, only 17% were excluded.

precision. For instance, terms such as ‘disclosed’ and ‘non-disclosed’ are sometimes more exact than ‘transparent’ and ‘non-transparent’ (i.e., when comprehension has not been assessed), and the implications can differ significantly.

Manipulation check questions are a straightforward way to assess participants’ understanding of a nudge. However, if the desire is to exclude participants from subsequent analyses, it is important that such questions apply equally across experimental conditions. Stricter demands on some experimental groups leads to asymmetrical exclusions and groups composed of participants with differing characteristics. As a result, the experimental effect becomes confounded. For instance, this could occur if the manipulation check concerns features of the choice architecture and these differ in salience (e.g., an opt-in default might be more intuitive than an opt-out default). Another example is if the check concerns contents of a disclosure statement that cannot be posed to a control group not receiving the disclosure. A general attention check, not relating to the nudge, can therefore be a better option since it enables for equally applied exclusions. Its relation to participants’ ability to identify the nudge or comprehend the disclosure statement can be inferred from a pretest (cf. Michaelsen *et al.*, 2020, study 3).

Finally, it should be noted that the data above are taken from research studies drawn mostly from a few online panels. While these panels are the same as for most other studies in this literature, it is not clear how well the results generalize beyond them. Also, once more, what constitutes a chooser’s proper understanding of a nudge’s influence depends on a normative stance. Passing a manipulation check might not count if the check is too shallow and spotting a ‘non-transparent’ nudge might not mean sufficiently acknowledging it.

Problem 4: Common study characteristics invite demand effects

Transparency about a nudge amplifies the nudge’s information signal; the recommended course of action becomes clearer to the chooser. Potentially, this could lead to an increase in the effectiveness of the intervention (Michaelsen and Sunstein, 2023). However, with increased clarity that a particular behavior is encouraged comes also the risk of demand effects – that participants feel obligated to behave in ways thought desired by the researcher. It is doubtful whether research results generalize to real-world policymaking scenarios if they depend on demand effects. The change of context likely means that the same psychological mechanisms, such as the same power dynamics, are not at play.

Widely shared study characteristics contribute to the risk of demand effects. At the heart of the problem lies the fact that almost all studies with incentivized/consequential choice tasks have the researcher act as the choice architect. This means that when transparency amplifies the recommendation implicit in the nudge, it amplifies the recommendation to do as the researcher wishes. In many studies, the nudged behavior also transparently benefits the researcher: The most used choice task consists of doing them a favor by answering extra, unpaid, survey questions. An added disclosure statement about the nudge may be interpreted by participants as a directive to comply. Some disclosure statements in the literature make the request to acquiesce rather salient, for example: ‘Please note the following: [by acting in line with the nudge], you guarantee

that we will be able to accomplish our research objectives'. Exacerbating the issue, samples in the above and most other studies are recruited from online panels (e.g., Mturk, Prolific) where participants depend on researchers' approval for crediting work quality and even for payment. Independently, but in particular in combination, these factors effectively incentivize participants not to be deterred by increased transparency.

One effective countermeasure would be to not rely on the researcher as choice architect. Field studies, where researchers partner with organizations or governmental agencies, seem a promising arena for achieving this without having to resort to non-incentivized choice tasks. Researchers may also explore further ways of clearly decoupling participants' behavior from their work approval and other researcher-related feedback, such as through increased anonymization or other data management practices. Stronger protection against demand effects will enable future research to better explore the potentially boosting effects of increased transparency.

Problem 5: Survey studies confound transparency and nudge type

Survey studies finding transparency to be associated with higher acceptability have generally compared purportedly⁶ covert interventions to fundamentally different, purportedly overt, interventions. For instance, some have compared *default enlisting* as an organ donor ('non-transparent intervention') to *information provision* about the benefits of enlisting ('transparent intervention'). It is not possible from such a design to separate whether people's preference is for more *transparency*, or some other element of the intervention. Future research can address this issue by varying levels of transparency for one and the same nudge intervention, for instance, by comparing a nudge with and without an accompanying disclosure.⁷

Problem 6: Method invariance limits generalizability

The literature features considerable homogeneity in methodology, which could affect how well findings generalize to many policymaking contexts. This is exemplified by the following three issues.

Low choice stakes

Studies predominantly rely on hypothetical or low-cost choices where participants forsake low effort or windfall money.⁸ An argument can be made that the lack of negative outcomes from increased transparency could stem from participants not being sufficiently invested to react adversely.

Homogeneity in operationalizations of transparency

Ironically, in relation to 'Problem 1', operationalizations of transparency have also been notably narrow. It largely remains to be seen what outcomes result from

⁶Gold *et al.* (2020) is an exception from actually measuring perceived transparency ('ease of identification').

⁷Yan and Yates (2019) provide rich data on perceptions of defaults with disclosures but do not include a non-disclosed comparison point.

⁸Bruns *et al.* (2018) constitute a positive exception in that participants were nudged to give away €8 of a €10 sign-up fee, which is both a more severe trade-off (less 'windfall'), and constitute comparatively high stakes.

other means of increasing transparency than through disclosure messages. Disclosures stand out in that their provision is clearly intentional. It is possible that more ambiguous methods of increasing transparency would produce stronger negative reactions, such as if choosers notice the presence of the intervention but infer no ambition to make it known (a few suggestions how are provided in Problem 2).

Homogeneity of nudges and applications

Defaults are widespread nudge interventions and frequently characterized as non-transparent (e.g., Smith *et al.*, 2013). This might explain why transparency studies have relied on them so heavily. They are, however, far from the only nudges in policymakers' toolboxes. To advance knowledge on transparency and nudging, more studies with other nudges are needed. Similarly, a more diverse set of implementation contexts and causes benefitting from the nudge would be informative. The extent to which the behavior encouraged by the nudge aligns the chooser's preferences appears a likely, yet understudied, moderator of transparency effects in behavioral studies.

Concluding remarks

Fourteen years after Bovens' conjecture that nudges 'work best in the dark' (2009, p. 13) evidence exists to evaluate it. The empirical literature on transparency and nudges provides plentiful examples where choosers are given fair opportunity to detect and understand the influence a nudge might have on their choices. Almost unanimously, results support that effectiveness does not decrease, and in this sense, the claim has been proven wrong. Choosers also generally do not appear to evaluate the nudge or the choice architect unfavorably upon being disclosed of the nudge's presence, while people do express a preference for transparency when asked in surveys.

However, important caveats exist. While the experimental data tell us what happens when choosers are told upfront about a nudge, we are not as well equipped to conclude what happens *when choosers are aware of the nudge*, since awareness generally is not confirmed (but see Wachner *et al.* (2020) and Michaelsen *et al.* (2020; 2021a) for indications that aware choosers act similarly). In this latter sense, one could argue that Boven's conjecture has not been dealt a fatal blow. Speculatively, whether or not transparency about a nudge changes people's behavior will have a lot to do with whether the behavior fits with the chooser's values and interests (Michaelsen & Sunstein, 2023). We also need future empirical work to tackle challenges raised by the possibility of confounding and demand effects in current study designs and to find out how results generalize to more costly or effortful choices.

Perhaps most pressing of all, future research should increasingly move beyond the lab and assess the effects of transparency in field settings valuable to policymakers. The present literature's heavy reliance on low-stakes online experiments remains a focal constraint on generalizability. The few existing field studies use brief operationalizations of transparency and concern rather uncontroversial behaviors, leaving it uncertain whether their insights transfer to more costly or contentious situations.

Finally, I have viewed it as beyond the scope of this text to attempt a concerted response to the criticisms raised. Instead, that space has been allotted to discussing

some ideas for how future research may do it better. It should be noted that individual counterexamples exist to several of the issues brought up.

In sum, despite notable limitations, the multitude of documented trials suggests that had transparency about a nudge led people to strongly disagree with it, then the present studies would have caught evidence of this. At present, no such pattern is found.

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