Using default nudges to promote healthier choices: The moderating role of self-control

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Abstract:

This study investigates how (trait) self-control moderates the effect of default nudges on healthier food choices. Defaults are widely studied as a tool to influence (food) choices. However, boundary conditions of their effect are unclear. In on an online experiment (N = 378), we tested how placing the default on the healthier or the unhealthier alternative influences food choice, and how self-control moderates this effect. The results confirm that people are likely to follow the default in most cases. Interestingly, lower self-control individuals are likely to follow the default regardless of whether the default is placed on the healthier or the unhealthier alternative, whereas high self-control individuals do seem more likely to deviate from the unhealthy default towards the healthier option. Further research is, however, required on the conditions under which such an effect can occur, as the result was not consistent.

Keywords: Nudging, self-control, choice
Track: Consumer behavior

In 2016, 39% of adults worldwide were overweight and 13% were obese (WHO, 2020). Being overweight is not without consequences: in 2016, 71% of all deaths worldwide were caused by non-communicable diseases such as diabetes and cardiovascular diseases, which are often related to overweight (WHO, 2019). We witness an increasing emphasis on a balanced nutritional diet with frequent exercising to cut down the prevalence of these non-communicable diseases. Governments are continuously in search of new ways to stimulate health-improving behavior. Nudging has proven to be an interesting avenue to support healthy lifestyles (De Ridder & Tummers, 2019; Kroese, Marchiori, & de Ridder, 2016). A nudge is a liberty-preserving approach that steers individuals in a particular direction, but still maintains the freedom of choice (Sunstein, 2014).

In this study, the focus is on nudging towards healthier food choices. Previous research on this topic mainly focusses on three types of nudges: product positioning (placing healthy snacks at the check-out; Kroese et al., 2016), adding information (putting the amount of calories on the menu; Rising and Bol, 2016) or the use of defaults (e.g., replacing the regular menu with a healthier variant; Peters et al., 2016). We want to further elaborate on the latter. A default is an option that is preselected, so when no active choice is made, the decision-maker will stick with the preselected option, the default (Thaler & Sunstein, 2008; Van Gestel, Adriaanse, & De Ridder, 2020). In our daily lives, we come across defaults all the time, going from white pasta in a restaurant to organ donation plans (Gill, 2018). Defaults are easy to implement and can be used across various product categories and services, making them a powerful tool to influence (food) choices, as has been proven by previous literature (Peters et al., 2016; van Kleef, Seijdell, Vingerhoeds, de Wijk, & van Trijp, 2018) . For example, when the default is changed to more nutritious, less caloric or even smaller options, this becomes the most popular choice (Bergeron, Doyon, Saulais, & Labrecque, 2019; Giesen, Geyskens, Goukens, & Havermans, 2013; van Kleef et al., 2018).

Defaults have already been frequently studied; however, a substantial variation in effect sizes can be noticed (Van Gestel et al., 2020). Therefore, we believe prior research has largely ignored important factors influencing food choices and default effectiveness. Some of these moderating factors have already been studied, such as the influence of income on savings plans (Beshears, Choi, Laibson, Madrian, & Wang, 2015) and cognitive load on green amenities choices (Van Gestel et al., 2020). However, to our best knowledge, these were not in a food-related context and many critical personality traits have not yet been discussed as potential moderators to the effectiveness of default nudging. The present study wants to

further elaborate on the moderating role of one's level of (trait) self-control on effect of defaults in a food choice context.

Self-control can be defined as "the ability to override or change one's inner responses, as well as to interrupt undesired behavioral tendencies (such as impulses) and refrain from acting on them" (Tangney, Baumeister, & Boone, 2004, p. 274). Low self-control individuals tend to have a higher chance of obesity, due to their difficulty in controlling their impulses (Baumeister, Vohs, & Tice, 2007; Fan & Jin, 2013). Previous research has found that adding information (e.g., the amount of calories) as a nudge only pushes high self-control individuals towards the healthier options (Mohr, Dolgopolova, & Roosen, 2019; Rising & Bol, 2016). Adding information will push people to think more about their choice, making it effective for high self-control individuals. Low self-control individuals tend to think less about decisions, and so providing (caloric) information often fails to achieve an impact. Defaults, on the other hand, rely on automatic processes. Therefore, we will propose that they work well for low (as well as high) self-control individuals, as described below.

1. Theoretical Background

1.1 The effect of default nudging

Defaults try to play on the subconsciousness of individuals. They are implemented by "pre-selecting" an option (explicitly or implicitly), so that that option will be chosen even when no (active) choice is made (Thaler & Sunstein, 2008). The default is a powerful tool, as people will only divert from the default when they have a strong motivation to do so (Samuelson & Zeckhauser, 1988). There are several reasons why defaults are so effective. First, diverting from the default requires cognitive action. Switching will cost more time, effort and attention, than sticking with the default would (Sunstein, 2017; van Kleef et al, 2018). Second, individuals will tend to stick to the status quo, whatever it is (status quo bias) (De Ridder & Tummers, 2019; Sunstein, 2017). The default also serves as a reference point from which gains are losses are measured (Sunstein, 2017). "Giving up" the default can be experienced as a loss (van Kleef et al., 2018). People dislike losses more than they like similar gains, that is why they are typically reluctant to change the default.

H1a: The healthier alternative is more likely to be chosen when it is the default, compared to when no default is applied.

H1b: The unhealthier alternative is more likely to be chosen when it is the default, compared to when no default is applied.

Usually, defaults are set on the "best" option for most people or on the option helping the weakest (Samson, 2014). For example, automatic enrollment in a savings plan will create higher participation, compared to when individuals actively need to choose a savings plan, letting individuals build up more capital (Sunstein, 2017). Defaults offer an informational signal, as they refer to the actions of the majority or to desired behavior (Samson, 2014; Sunstein, 2017). Furthermore, they imply a recommendation by the choice architect and it is up to the decision-maker to follow this recommendation or not (Van Gestel et al., 2020). As a result, many individuals think the default is always the best option, even though this is not always the case. For example one size does not fit all in case of health insurance (Sunstein, 2017). Some families will have other health care needs, making them eligible for another health care plan.

1.2 Self-control as a moderating trait

We expect the level of self-control to moderate the effectiveness of the default on food choices, as can be seen in Figure 1. Self-control performs an important role to guide people towards healthy behavior and habits, especially when it comes to resisting temptations like eating unhealthy food (Mohr et al., 2019). People with obesity often have less optimal eating habits compared to individuals with a healthy weight (NHS, 2019). Low self-control individuals experience difficulty in controlling impulses, such as overeating, and therefore have a higher chance of obesity (Baumeister et al., 2007; Fan & Jin, 2013). The less self-control an individual has, the more he or she is drawn to the "easier" choice (i.e., the default), whether or not this is the "best" (i.e. healthiest) one (Baumeister, Bratslavsky, Muraven, & Tice, 1998). In other words, people with lower self-control are more likely to follow the default, regardless of the healthiness of the option, or other considerations.

H2: Low self-control individuals are more likely to follow the default, regardless of whether the unhealthier or healthier alternative is defaulted.

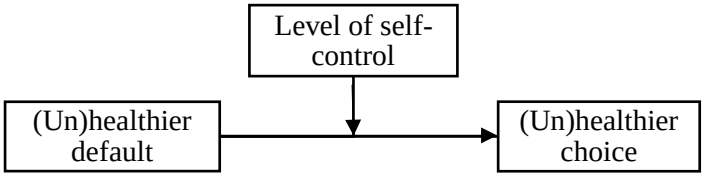

Figure 1: Conceptual framework

People with high self-control are better at controlling their emotions and impulses, which often is associated with positive outcomes such as good health and higher well-being (De Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012; WRR, 2017). High self-control individuals tend to be better at postponing immediate gratification with the aim of obtaining a later, more valuable reward, also defined as delayed gratification (Mischel, Shoda, & Rodriguez, 1989). Based on these findings, we expect individuals with higher self-control to be less reliant on the default and more often make an active choice to go for the healthier choice (De Ridder et al., 2012; WRR, 2017). Therefore, we expect them to be more likely to divert from an unhealthy default. In addition, a healthy default could give an extra push to select the healthier option.

H3: Higher level self-control individuals will more often choose the healthier alternative, regardless of the default.

2. Method

To test our hypotheses, a three-level (no default (control), healthy default, unhealthy default) between-subjects online experiment was conducted. The survey was distributed through the social media channels of the researchers. A scenario was described, stating it was a warm day and respondents felt like getting a refreshing snack and a good friend suggests to go eat frozen yogurt. Consequently, respondents were asked to make two consecutive choices. First, they had to select a frozen yogurt base (frozen yogurt choice): regular frozen yogurt (unhealthier) or light (healthier). Then, they had to select a topping (topping choice): chocolate/cookies (unhealthier) or fruit (healthier). To minimize the pricing effect, it was indicated there was no price difference between the choice options.

Respondents were randomly divided across the three experimental conditions. In the control condition, there was no pre-selected option. In the unhealthy default condition, the unhealthier alternatives (normal frozen yogurt and chocolate/cookies) were pre-selected as a default. In the healthy default condition, the default was put on the healthier alternatives (light frozen yogurt and fruit). To give the experiment a realistic touch, and to test more authentic preferences, participants could win their selection in real life. For this, we raffled off 10 vouchers from a frozen yogurt store in Antwerp, Belgium, among the participants.

Subsequently, respondent's degree of self-control was measured using a shortened version of the self-control scale by Tangney et al. (2004) (24 items, 7-point scale, $\alpha = .85$). The questionnaire ended with questions on length and height (to calculate the BMI) and

socio-demographic questions: gender, age, and education. The final sample consisted of 349 Belgian respondents ($\bar{X}_{age}$ = 30.8, SD_{age} = 13.7, 21% male). Most participants (61%) have obtained at least a Bachelor's degree. The average self-control score ranged from 2.17 to 6.13 ($\bar{X}$ = 4.06, *SD* = 0.80).

3. Results

First, the difference in choice between the control condition (no default) and the healthy default was examined. People were significantly more likely to select the healthier (light) frozen yoghurt when it was defaulted (65.0%) than in the control condition (23.9%) ($\chi^2(1)$ = 40.42, $p < .001$). While a similar pattern was observed for the toppings (68.3% vs 60.7%), this difference was not significant ($\chi^2(1)$ = 1.52, p = .218). H1a is partially confirmed. Next, the difference between the control condition (no default) and the unhealthy default on choice was examined. No significant difference for the frozen yogurt choice ($\chi^2(1)$ = .001, p = .975) or for the toppings choice ($\chi^2(1)$ = 1.49, p = .222) was found. In the control condition, 76.1% choose the unhealthier (regular) frozen yogurt (natural) and 39.3% choose the unhealthier topping (chocolate/ cookies) compared to respectively 75.9% and 47.3% in the unhealthy default condition. As the unhealthy default did not exert a significant effect on either choice, H1b is rejected.

		Control condition	Unhealthy default	Healthy default
Frozen yoghurt choice	Unhealthier option (light)	77.6%	76.9%	32.8%
	Healthier option (regular)	22.4%	23.1%	67.2%
Topping choice	Unhealthier option (chocolate/cookies)	53.4%	59.6%	32.8%
	Healthier option (fruit)	46.6%	40.4%	67.2%

Table 1: Food choice per condition (low self-control group)

To assess the moderating effect of self-control on the default effectiveness, we median split self-control, dividing the respondents in two groups: low self-control (*M* = 3.43, *SD* = .49) and high self-control (*M* = 4.70, *SD* = .46). As expected, low self-control individuals tended to follow the default, regardless of whether the default was healthy or unhealthy (Table 1). The unhealthy default was followed by 76.9% (frozen yogurt) and 59.3% (topping)

of participants with low self-control. With the healthy default, 67.2% selected the healthier alternative in both choices. Low self-control individuals were most likely to select the unhealthier options in the control condition: 77.6% chose regular frozen yogurt and 53.4% chose chocolate/cookies. The differences between conditions were significant for both the frozen yogurt choice ($\chi^2(2) = 34.40$, $p < .001$), as well as the topping choice ($\chi^2(2) = 9.62$, $p = .008$). H2 is confirmed.

Finally, for the high self-control individuals, we found mixed results. For the frozen yogurt choice ($\chi^2(2) = 21.69$, $p < .001$), we replicate the default effect found in the total sample and for low self-control individuals. High self-control individuals were most likely to select the unhealthier alternative (74.6%) in the control condition and the unhealthy default condition (75.0%), but 62.3% chose the healthier (light) yogurt when it was defaulted (Table 2). In the topping choice ($\chi^2(2) = 1.78$, $p = .411$), the healthier option (fruit) was the most popular in all three conditions (74.6% in control, 63.3% in unhealthy default, 69.8% in healthy default). We expected higher level self-control individuals to choose the healthier options, regardless of the default. This effect was only valid with the topping choice. H3 is partially confirmed.

		Control condition	Unhealthy default	Healthy default
Frozen yoghurt choice	Unhealthier option (light)	74.6%	75.0%	37.7%
	Healthier option (regular)	25.4%	25.0%	62.3%
Topping choice	Unhealthier option (chocolate/cookies)	25.4%	36.7%	30.2%
	Healthier option (fruit)	74.6%	63.3%	69.8%

Table 2: Food choice per condition (high self-control group)

4. Discussion and implications

Previous studies found a strong variation in effect sizes of defaults. This study investigated one of the moderators possibly influencing the effectiveness of the default, namely trait self-control. Interestingly, we found defaults are effective in some, but not all cases. In particular, the default only significantly pushed the frozen yogurt choice toward the healthier alternative, not the toppings choice. Unhealthy defaults also did not lead people to substantially chose unhealthy options more (compared to no default).

The results of the Chi-square analysis indicate that self-control exerts a moderating effect on the default effectiveness and the final (un)healthier choice made. In particular, low self-control individuals are especially prone to follow the default, regardless of whether or not it is a health-beneficial default. Conversely, high self-control individuals tend to more often make an active (healthy) choice. This was only true for the topping though, where it was very clear what the healthier alternative was (fruit versus chocolate/cookies). When the difference in healthiness is smaller or perhaps ambiguous ("light" denotes less fat, but is not necessarily always more healthy because it can contain other additives and there is much debate on the health effects of sweeteners as aspartame), high self-control individuals also tend to stick to the default. In our experiment, the difference between regular frozen yogurt and light frozen yogurt was relatively small. When two food items are more alike, it is possible individuals are more indifferent to which one they choose. When the health benefits are also more ambiguous, people may be unsure of what the "best" option is, and look to defaults to help them ascertain which is preferred. Most previous studies only studied the effect of defaults when the difference in healthiness is extremely clear, for example putting the default on either an apple or chocolate (Kroese et al., 2016). In our experiment, we tested this through the toppings choice (fruit versus chocolate/cookies). Low self-control individuals followed the default here. Contrarily, high self-control individuals preferred fruit in any situation and therefore only followed the healthier default. An active choice for a healthier lifestyle, delayed gratification, or simply a higher preference for one of the two toppings can be at the base of this choice (Mischel et al., 1989).

It is important to note that low self-control individuals tend to have a higher chance of obesity, due to their difficulty in controlling their impulses (Baumeister et al., 2007; Fan & Jin, 2013). Influencing low self-control individuals' food choices is therefore more important than influencing high self-control individuals (as high self-control individuals will often make the healthier choice on their own). When it comes to food choice, most defaults are (often implicitly) currently set on "unhealthier" food (for example white pasta instead of whole wheat pasta). We suggest changing the default to the healthier options, as this will be particularly effective for low self-control individuals without adverse effects on high self-control individuals. Furthermore, a healthy default will push both the actively healthy choosers and the more passive default followers to the healthier alternative.

As an online customer-choice survey was used, customers might have not chosen their real preference. Results might differ in a field experiment. We tried to add a realistic component by raffling off ten vouchers for frozen yogurt. The respondents could win the – by

them – created frozen yogurt. Another limitation is that the order of the two choices (frozen yogurt and toppings) was not randomized, which might impact the topping choice made due to moral licensing. However, in real life, one would also pick the frozen yogurt base first, before selecting toppings. Therefore, it seemed logical to not randomize. Finally, frozen yogurt can be seen as a "treat". People eat it as a snack to spoil themselves, which may affect their preference for healthy options compared to main meals. Frozen yogurt as a treat is already relatively healthy compared to other snacks (such as regular ice cream or potato chips). This may again influence choice, making it important to replicate this study with other product categories.

Further research should investigate the impact of self-control on defaults in different settings and with different food items. Furthermore, there are still many other boundary conditions that might influence default effectiveness that can be studied to determine in which settings the default works best. Adding too many defaults will make – even low self-control – individuals aware of the nudge, which can lead to them actively react against it. Further, investigating the boundaries will help policymakers to better design the choice architecture so defaults are only used when they add proper value.

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