# Appendix

Table A1 The reviewed studies by research domain, target behavior, type of control and treatment group, sub-studies, study type and country

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ID | Author | Domain | Target behavior | Treatment | Control | Sub | Study-type | Country |
| 1 | (Bruns et al., 2018) | ♡ | charitable giving | DDC | ACC | 4 | Lab experiment | NL and GER |
| 2 | (Briscese, 2019) | ♡ | charitable giving, charitable re-lending | ACC + DDC | UDC | 2 | Field experiment | AUS |
| 3 | (Crow et al., 2019) | ♡ | charitable giving (at checkout counter) | DDC | ACC | 1 | Online Experiment | USA |
| 4 | (Fosgaard and Piovesan, 2015) | ♡ | charitable giving (public good game) | DDC | UDC | 1 | Lab Experiment | DK |
| 5 | (Ghesla et al., 2020) | ♡ | charitable giving | DDC | ACC | 2 | Lab Experiment | SWI |
| 6 | (Zarghamee et al., 2017) | ♡ | Charitable giving | DDC | UDC | 1 | framed field experiment | USA |
| 7 | (Schulz et al., 2018) | ♡ | Charitable giving | DDC | ACC | 1 | Framed Experiment | SWI |
| 8 | (Nelson et al., 2019) | ♡ | Charitable giving (on-site, for coastal and marine conservation) | DDC | ACC | 3 | Field experiment | IDN |
| 9 | (d’Adda et al., 2017) | ♡ | charitable giving (dictator game and PD) | DDC | ACC | 2 | Online Experiment | USA |
| 10 | (Goswami and Urminsky, 2016) | ♡ | Charitable giving (donating > 0) | DDC | ACC | 27 | lab, online and field experiment | USA |
| 11 | (Schneider et al., 2019) | @ | Selecting the eID | DDC | ACC | 2 | Online Experiment | USA |
| 12 | (Dogruel et al., 2017) | @ | increase use of privacy settings | ACC + DDC | UDC | 2 | Online Experiment | USA |
| 13 | (Dranseika and Piasecki, 2020) | @+✙ | increase consent to participate in learning health care system | DDC | UDC | 2 | Lab experiment | UK |
| 14 | (Theotokis and Manganari, 2015) | @+✈︎ | Participation in e-statement service, Participation in e-bills, Increase towel reuse in hotels | ACC + DDC | UDC | 4 | Lab and Field experiment | ? |
| 15 | (Ang and Alexandrov, 2017) | $ | Uptake of federal student loans as opposed to private | DDC | UDC | 1 | Field experiment | USA |
| 16 | (Hoffmann et al., 2019) | $ | increase socially responsible investment (SRI) | ACC | UDC | 2 | Online Experiment | AUS |
| 17 | (Fonseca and Grimshaw, 2017) | $ | decrease tax non-compliance | DDC | ACC | 3 | Online Experiment | UK |
| 18 | (Feltz, 2016) | $ | Improve surrogate financial decisions (payment partially invested in index fund, annual payment) | DDC | ACC | 2 | Online Experiment | USA |
| 19 | (Camilleri et al., 2019) | $ | Better retirement investments choices (by "life cycle model") | ACC + DDC | UDC | 1 | Online Experiment | AUS |
| 20 | (Brune et al., 2017) | $ | increase savings and reduce (temptation) spending | DDC | UDC | 1 | Field experiment | MAL and ZIM |
| 21 | (Haan and Linde, 2018) | $ | Better investment decisions (maximizing payout) | DDC | UDC | 1 | Lab experiment | NL |
| 22 | (Loeb et al., 2018) | ⚘ | choose healthier lunch menu | DDC | UDC | 1 | Field experiment | USA |
| 23 | (Friis et al., 2017) | ⚘ | increase vegetable intake (healthier) | DDC | ACC | 1 | Lab experiment | DK |
| 24 | (Broers et al., 2017) | ⚘ | increase Salsify soup purchase | DDC | ACC | 1 | Field experiment | BEL |
| 25 | (Mikkelsen and Quinto Romani, 2017) | ⚘ | reduce butter consumption | DDC | ACC | 1 | Field experiment | DK |
| 26 | (Campbell-Arvai et al., 2012) | ⚘ | choose meat free meal | DDC | ACC | 2 | Lab experiment | USA |
| 27 | (van Kleef et al., 2018) | ⚘ | choose whole bread sandwich instead of white bread (healthier) | DDC | UDC | 1 | Lab Experiment | NL |
| 28 | (Bergeron et al., 2019) | ⚘ | choose lighter dessert (healthier) | DDC | UDC | 2 | Field experiment | FR |
| 29 | (Saulais et al., 2019) | ⚘ | choose vegetable burger | ACC + DDC | UDC | 2 | Field experiment | FR |
| 30 | (Loeb et al., 2017) | ⚘+✙ | choose healthier breakfast menu, increase fitness level of child | DDC | UDC | 2 | Lab experiment | USA |
| 31 | (Shealy et al., 2018) | ⟰ | Increased intended Envision score | DDC | UDC | 1 | Online Experiment? | USA |
| 32 | (Shealy and Klotz, 2015) | ⟰ | Increased intended Envision score | DDC | UDC | 1 | Framed field experiment | USA |
| 33 | (Ghesla, 2017) | ☼ | 100% green energy contract | ACC + DDC | UDC | 5 | Lab Experiment | SWI |
| 34 | (Ebeling and Lotz, 2015) | ☼ | 100% green energy contract | DDC | UDC | 1 | Field experiment | GER |
| 35 | (Momsen and Stoerk, 2014) | ☼ | 50% green energy contract | DDC | ACC | 1 | Online Experiment | GER |
| 36 | (Ölander and Thøgersen, 2014) | ☼ | authorizing smart grid tech | DDC | UDC | 1 | Experimental study | DK |
| 37 | (Vetter and Kutzner, 2016) | ☼ | choosing green electricity provider | DDC | UDC | 2 | Online Experiment | GER |
| 38 | (Ghesla et al., 2020) | ☼ | choose more environmentally friendly electricity contract | DDC | ACC | 1 | Field experiment and online study | SWI |
| 39 | (Chung and Rimal, 2015) | ✙ | increase uptake of HIV testing | DDC | ACC | 2 | Field experiment | MAL and ZIM |
| 40 | (Beshears et al., 2019) | ✙ | encourage home delivery for long-term prescription medications | DDC | UDC | 1 | Field experiment | USA |
| 41 | (Arvanitis et al., 2019) | ✙ | Enrollment to a specific Health Insurance plan | DDC | ACC | 1 | Experimental study | GRE |
| 42 | (Montoy et al., 2020) | ✙ | Reduce Opioids prescriptions | DDC | ACC | 5 | Field experiment | USA |
| 43 | (Lehmann et al., 2016) | ✙ | increase uptake of influenza vaccination (among health care workers) | DDC | UDC | 1 | Field experiment | NL |
| 44 | (Soon et al., 2019) | ✙ | Decrease practitioner’s choice for low value care options | DDC | ACC | 1 | Online experiment | AUS |
| 45 | (Malhotra et al., 2016) | ✙ | increase use of generic (non-branded) medication | DDC | ACC | 1 | Field experiment | USA |
| 46 | (Hsu et al., 2019) | ✙ | Increase clinic transfer rates | DDC | UDC | 1 | Field experiment | TWN |
| 47 | (Venema et al., 2018) | ✙ | increase standing time at work | DDC | UDC | 1 | Field experiment | NL |
| 48 | (Bourdeaux et al., 2016) | ✙ | improve medical ventilation settings (low tidal volume (Tve) standard) | DDC | UDC | 1 | Field experiment | UK |
| 49 | (Moseley and Stoker, 2015) | ✙ | increase willingness to donate organs | DDC | UDC | 1 | online experiment | UK |
| 50 | (Probst et al., 2013) | ✙ | Increase number of relevant laboratory tests ordered (decrease irrelevant tests) | DDC | UDC | 2 | online experiment | USA |
| 51 | (Howard-Anderson et al., 2020) | ✙ | reduce inappropriate (and total) tests for Clostridioides difficile infection | DDC | UDC | 2 | Field study | USA |
| 52 | (Patel et al., 2017) | ✙ | increase influenza vaccination rate | ACC | UDC | 1 | Field experiment | USA |
| 53 | (Patel et al., 2016) | ✙ | increase in physician ordering of mammography and colonoscopy | ACC | UDC | 2 | Field experiment | USA |
| 54 | (Bourdeaux et al., 2014) | ✙ | reduce use of Hydroxyethyl starch, and increase use of chlorhexidine mouthwash | ACC | UDC | 2 | Field experiment | UK |
| 55 | (O’Reilly-Shah et al., 2018) | ✙ | increase lung-protective ventilation (LPV) strategies during anesthesia | DDC | UDC | 2 | Field experiment | USA |
| 56 | (Liebig and Rommel, 2014) | Other | attach a sticker on the mailbox | DDC | ACC | 1 | Field experiment | GER |
| 57 | (Mazar and Hawkins, 2015) | Other | reduce systematic cheating | ACC + DDC | UDC | 1 | Lab Experiment | CAN |
| 58 | (Paunov et al., 2019) | Other | selecting a longer survey than paid for | DDC | ACC | 4 | Online Experiment | UK |
| 59 | (Stryja and Satzger, 2019) | ✈︎ | Switch to an e-car after initially choosing petroleum car | DDC | ACC | 1 | Online experiment | GER |
| 60 | (Kesternich et al., 2019) | ✈︎ | offset CO2 emissions for travel | ACC | UDC | 1 | Field experiment | GER |
| 61 | (Knezevic Cvelbar et al., 2019) | ✈︎ | reduce requests for room cleaning in hotels | DDC | UDC | 1 | Field experiment | SVN |

♡=Charity, @=Digitalization and Privacy Concerns, $=Finance, ⚘=Food Choices, ⟰= Green Architecture, ☼=Green Energy, ✙=Health Care, ✈︎=Travel, DDC=desirable default condition, ACC=active choice condition, UDC=undesirable default condition, Sub= number of sub-studies (many studies had more than one intervention but not necessarily a second default type intervention. Sub-studies list only default interventions)

Table A2 Nudge success for studies with UDC, ACC and DDC

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ID | Target Behavior | UDC | ACC | DDC | DDCs |
| 2 | charitable giving [%] | .03 | .05 | .78 | \*\*\* |
| 2 | Charitable re-lending [%] | .24 | .2 | .96 | \*\*\* |
| 8 | Charitable giving (on-site, for coastal and marine conservation) [%] | .55 | .2 | .75 | \*\*\* |
| 12 | increase use of privacy settings [up to 4 priv. settings] | 1.89 | 1.69 | 2.64 | \*\*\* |
| 12 | increase use of privacy settings [up to 4 priv. settings] | 1.6 | 1.69 | 2.4 | \*\*\* |
| 14 | Participation in e-statement service [%] | .56 | .79 | .7 | \*\* |
| 14 | Participation in e-bills [Likert 1-7] | 3.5 | 5.3 | 5.5 | \*\* |
| 19 | Better retirement investments choices (by "life cycle model") [%] | .3325 | .29 | .625 | \*\*\* |
| 28 | choose lighter dessert (healthier) [%] | .31 | .38 | .79 | \*\* |
| 29 | choose vegetable burger [%] | .273 | .344 | .596 | \*\* |
| 33 | 100% green energy contract [%] | .37 | .36 | .59 | \*\*\* |
| 33 | 100% green energy contract [%] | .65 | .55 | .83 | \*\*\* |
| 33 | 100% green energy contract [%] | .04 | .06 | .17 | \*\*\* |
| 33 | 100% green energy contract [%] | .04 | .06 | .24 | \*\*\* |
| 33 | 100% green energy contract [%] | .04 | .02 | .2 | \*\*\* |
| 57 | reduce systematic cheating [%] | .4544 | .2386 | .0818 | \*\* |

\*\*=p<0.01, \*\*\*=p<0.001, DDCs= significance level DDC vs. UDC, sub-studies may differ with respect to the tested default or target behavior, DDC=desirable default condition, ACC=active choice condition, UDC=undesirable default condition

Table A3 Nudge success for studies with variations in invasiveness

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ID | Target behavior | invasiveness | UDC | ACC | DDC | DDCs |
| 5 | charitable giving [%] | costless | . | .274 | .3426 | \* |
| 5 | charitable giving [%] | costly | . | .274 | .59 | \*\*\* |
| 8 | Charitable giving (on-site, for coastal and marine conservation) [%] | costless | .48 | . | .62 | \*\*\* |
| 8 | Charitable giving (on-site, for coastal and marine conservation) [%] | framing | . | .2 | .35 | \*\*\* |
| 8 | Charitable giving (on-site, for coastal and marine conservation) [%] | costless | .55 | .2 | .75 | \*\*\* |
| 9 | charitable giving (dictator game and PD) [USD-cents] | framing | . | .2669 | .3229 | \* |
| 9 | charitable giving (dictator game and PD) [USD-cents] | costless | . | .2669 | .2821 | n.s. |
| 18 | Improve surrogate financial decisions [%] | costless | . | .71 | .85 | \*\*\* |
| 18 | Improve surrogate financial decisions (choose annual payment) [%] | framing | .69 | . | .91 | \*\*\* |
| 28 | choose lighter dessert (healthier) [%] | framing | .38 | . | .75 | \*\*\* |
| 28 | choose lighter dessert (healthier) [%] | costless | .31 | .38 | .79 | \*\* |
| 54 | reduce use of Hydroxyethyl starch (can cause renal failure) [%] | Active choice no framing | .541 | .031 | . | \*\*\* |
| 54 | Increase use of chlorhexidine mouthwash (reduces ventilator associated pneumonia) [%] | costless | . | .553 | .904 | \*\*\* |
| 55 | increase lung-protective ventilation (LPV) strategies during anesthesia [%] | costless | .593 | . | .54 | n.s. |
| 55 | increase lung-protective ventilation (LPV) strategies during anesthesia [%] | framing | .593 | . | .755 | \*\*\* |

\*\*=p<0.01, \*\*\*=p<0.001, DDCs= significance level DDC vs. UDC, sub-studies may differ with respect to the tested default or target behavior, DDC=desirable default condition, ACC=active choice condition, UDC=undesirable default condition, study #10 neglected for convenient display

Table A4 Nudge success for environmentally integrated defaults

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ID | Target behavior | UDC | ACC | DDC | DDCs | Freq |
| 20 | increase savings and reduce (temptation) spending [%] | .065 | . | .283 | \*\*\* | daily |
| 23 | increase vegetable intake (healthier) [Gramm] | . | 193.67 | 238.88 | \*\* | daily |
| 25 | reduce butter consumption [butter packages p.p.] | . | .7 | .3 | \*\*\* | daily |
| 31 | Increased intended Envision score [%] | .56 | . | .79 | \*\*\* | several times a year |
| 32 | Increased intended Envision score [%] | .44 | . | .62 | \*\*\* | several times a year |
| 47 | increase standing time at work [%] | .018 | . | .1313 | n.r. | daily |
| 48 | improve medical ventilation settings [low tidal volume (TVE) standard]  | 6.47 | . | 6.1 | n.r. | daily |
| 55 | increase lung-protective ventilation (LPV) strategies during anesthesia [%] | .593 | . | .54 | n.s. | daily/weekly |
| 55 | increase lung-protective ventilation (LPV) strategies during anesthesia [%] | .593 | . | .755 | \*\*\* | daily/weekly |
| 56 | attach a sticker on the mailbox [%] | . | .1598 | .2166 | \*\* | daily/weekly |

\*\*=p<0.01, \*\*\*=p<0.001, n.s.= not significant, n.r.=not reported, DDCs= significance level DDC vs. UDC, sub-studies may differ with respect to the tested default or target behavior, DDC=desirable default condition, ACC=active choice condition, UDC=undesirable default condition, Freq= expected frequency of choice