



Verhaltensinterventionen im Wandel: Status Quo und zukünftige Möglichkeiten

Tina Joanes, Wencke Gwozdz

Literatur

1. Popkin BM, Corvalan C., Grummer-Strawn LM: Dynamics of the double burden of malnutrition and the changing nutrition reality. *The Lancet*, 2020; 395(10217): 65–74.
2. Richardson K, Steffen W, Lucht W, et al.: Earth beyond six of nine planetary boundaries. *Sci Adv* 2023; 9(37): eadh2458.
3. Lucas T, Horton R: The 21st-century great food transformation. *The Lancet* 2019; 393(10170): 386–7.
4. Saunders TJ, McIsaac T, Douillette K, et al.: Sedentary behaviour and health in adults: an overview of systematic reviews. *Appl Physiol Nutr Metab* 2020; 45(10) Suppl. 2: S197–217.
5. Schienkowitz A, Kuhnert R, Blume M, Mensink GB: Übergewicht und Adipositas bei Erwachsenen in Deutschland – Ergebnisse der Studie GEDA 2019/2020-EHIS. *Journal of Health Monitoring* 2022; 7(3): 23–31.
6. Rockström J, Edenhofer O, Gaertner J, DeClerck F: Planet-proofing the global food system. *Nature Food* 2020; 1(1): 3–5.
7. Parlasca MC, Qaim M: Meat consumption and sustainability. *Annu Rev Resour Econ* 2022; 14: 17–41.
8. Neuenschwander M, Ballon A, Weber KS, et al.: Role of diet in type 2 diabetes incidence: umbrella review of meta-analyses of prospective observational studies. *BMJ* 2019; 366: l2368.
9. Bowles N, Alexander S, Hadjikakou M: The livestock sector and planetary boundaries: A 'limits to growth' perspective with dietary implications. *Ecol Econ* 2019; 160: 128–36.
10. Willett W, Rockström J, Loken B, et al.: Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems. *The Lancet* 2019; 393(10170): 447–92.
11. Whitmee S, Haines A, Beyrer C, et al.: Safeguarding human health in the Anthropocene epoch: Report of The Rockefeller Foundation-Lancet Commission on planetary health. *The Lancet* 2015; 386(10007): 1973–2028.
12. Bundesministerium für Landwirtschaft und Ernährung: Versorgungsbilanzen Fleisch. 2023. www.bmel-statistik.de/ernaehrung-fischerei/versorgungsbilanzen/fleisch (last accessed on 22 January 2024).
13. Koch F, Heuer T, Krems C, Claupein E: Meat consumers and non-meat consumers in Germany: a characterisation based on results of the German National Nutrition Survey II. *J Nutr Sci* 2019; 8: e21.
14. Michie S, van Stralen MM, West R: The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implement Sci* 2011; 6(1): 42.
15. Presseau J, McCleary N, Lorencatto F, Patey AM, Grimshaw JM, Francis JJ: Action, actor, context, target, time (AACTT): A framework for specifying behaviour. *Implement Sci* 2019; 14(1): 102.
16. Michie S, Thomas J, Johnston M, et al.: The Human Behaviour-Change Project: harnessing the power of artificial intelligence and machine learning for evidence synthesis and interpretation. *Implement Sci* 2017; 12(1): 121.
17. Stok FM, Hoffmann S, Volkert D, et al.: The DONE framework: creation, evaluation, and updating of an interdisciplinary, dynamic framework 2.0 of determinants of nutrition and eating. *PLOS ONE* 2017; 12(2): e0171077.
18. Graça J, Godinho CA, Truninger M: Reducing meat consumption and following plant-based diets: Current evidence and future directions to inform integrated transitions. *Trends Food Sci Technol* 2019; 91: 380–90.
19. Leng G, Adan RAH, Belot M, et al.: The determinants of food choice. *Proc Nutr Soc* 2017; 76(3): 316–27.
20. Wahl DR, Villinger K, Blumenschein M, et al.: Why we eat what we eat: assessing dispositional and in-the-moment eating motives by using ecological momentary assessment. *JMIR mHealth uHealth* 2020; 8(1): 1–14.
21. Bauer JM, Reisch LA: Behavioural insights and (un)healthy dietary choices: a review of current evidence. *J Consum Policy* 2019; 42(1): 3–45.
22. Hollands GJ, Bignardi G, Johnston M, et al.: The TIPPME intervention typology for changing environments to change behaviour. *Nat Hum Behav* 2017; 1(8). DOI: <https://doi.org/10.1038/s41562-017-0140>
23. Carey RN, Connell LE, Johnston M, et al.: Behavior change techniques and their mechanisms of action: a synthesis of links described in published intervention literature. *Ann Behav Med* 2019; 53(8): 693–707.
24. Michie S, West R, Sheals K, Godinho CA: Evaluating the effectiveness of behavior change techniques in health-related behavior: A scoping review of methods used. *Transl Behav Med* 2018, 8(2): 212–24.
25. Nisa CF, Bélanger JJ, Schumpe BM, Faller DG: Meta-analysis of randomised controlled trials testing behavioural interventions to promote household action on climate change. *Nat Commun* 2019; 10(1): 4545.
26. Samdal GB, Eide GE, Barth T, Williams G, Meland E: Effective behaviour change techniques for physical activity and healthy eating in overweight and obese adults; systematic review and meta-regression analyses. *Int J Behav Nutr Phys Act* 2017; 14(1): 42.
27. Damschroder LJ, Reardon CM, Widerquist MAO, Lowery JC: The updated consolidated framework for implementation research based on user feedback. *Implement Sci* 2022; 17(1). DOI: <https://doi.org/10.1186/s13012-022-01245-0>
28. Nielsen L, Riddle M, King JW, et al.: The NIH science of behavior change program: transforming the science through a focus on mechanisms of change. *Behav Res Ther* 2018; 101: 3–11.
29. Ajzen I: Theory of planned behavior. *Organ Behav Hum Decis Process* 1991; 50(2), 179–211.
30. Schwartz SH: Normative influences on altruism. *Adv Exp Soc Psychol* 1977; 10: 221–79.



31. West R, Godinho CA, Bohlen LC, et al.: Development of a formal system for representing behaviour-change theories. *Nat Hum Behav* 2019; 3(5): 526–36.
32. Dombrowski SU, Snihotta FF, Avenell A, Johnston M, MacLennan G, Araújo-Soares V: Identifying active ingredients in complex behavioural interventions for obese adults with obesity-related co-morbidities or additional risk factors for co-morbidities: a systematic review. *Health Psychol Rev* 2012; 6(1): 7–32.
33. Prestwich A, Snihotta FF, Whittington C, Dombrowski SU, Rogers L, Michie S: Does theory influence the effectiveness of health behavior interventions? Meta-analysis. *Health Psychol* 2014; 33(5): 465–74.
34. Willmott T, Pang B, Rundle-Thiele S, Badejo A: Reported theory use in electronic health weight management interventions targeting young adults: a systematic review. *Health Psychol Rev* 2019; 13(3): 295–317.
35. Hagger MS, Cameron LD, Hamilton K, Hankonen N, Lintunen T: The science of behavior change: the road ahead. In: Hagger MS, Cameron LD, Hamilton K, Hankonen N, Lintunen T (eds.): *The handbook of behavior change*. 1st ed., Cambridge University Press 2020, 677–99.
36. Varotto A, Spagnolli A: Psychological strategies to promote household recycling. A systematic review with meta-analysis of validated field interventions. *J Environ Psychol* 2017; 51: 168–88.
37. Willmott T, Rundle-Thiele S: Are we speaking the same language? Call for action to improve theory application and reporting in behaviour change research. *BMC Public Health* 2021; 21(1): 479.
38. Michie S, Carey RN, Johnston M, et al.: From theory-inspired to theory-based interventions: a protocol for developing and testing a methodology for linking behaviour change techniques to theoretical mechanisms of action. *Ann Behav Med* 2018; 52(6): 501–12.
39. Michie S, Richardson M, Johnston M, et al.: The behavior change technique taxonomy (v1) of 93 hierarchically clustered techniques: building an international consensus for the reporting of behavior change interventions. *Ann Behav Med* 2013; 46(1): 81–95.
40. Corker E, Marques M, Johnston M, West R, Hastings J, Michie S: Behaviour change techniques taxonomy v1: Feedback to inform the development of an ontology [version 2; peer review: 2 approved]. *Wellcome Open Research* 2023; 7: 211.
41. Johnston M, Carey RN, Bohlen LEC, et al.: Development of an online tool for linking behavior change techniques and mechanisms of action based on triangulation of findings from literature synthesis and expert consensus. *Transl Behav Med* 2021; 11(5): 1049–65.
42. Chevance G, Perski O, Hekler EB: Innovative methods for observing and changing complex health behaviors: four propositions. *Transl Behav Med* 2021; 11(2): 676–85.
43. Bamberg S, Möser G: Twenty years after hines, hungerford, and tomara: a new meta-analysis of psycho-social determinants of pro-environmental behaviour. *J Environ Psychol* 2007; 27(1): 14–25.
44. Webb TL, Sheeran P: Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. *Psychol Bull* 2006; 132(2): 249–68.
45. Kennedy E, Krahn HJ, Krogman N: Are we counting what counts? A closer look at environmental concern, pro-environmental behaviour, and carbon footprint. *Local Environ* 2015; 20: 220–36.
46. Moser S, Kleinhüchelkotten S: Good intents, but low impacts: diverging importance of motivational and socioeconomic determinants explaining pro-environmental behavior, energy use, and carbon footprint. *Environ Behav* 2018; 50(6): 626–56.
47. Nielsen KS, Cologna V, Lange F, Brick C, Stern PC: The case for impact-focused environmental psychology. *J Environ Psychol* 2021; 74. DOI: <https://doi.org/10.1016/j.jenvp.2021.101559>
48. Nielsen KS, Brick C, Hofmann W, Joanes T, Lange F, Gwozdz W: The motivation-impact gap in pro-environmental clothing consumption. *Nat Sustain* 2022; 5(8): 665–68.
49. Kwasny T, Dobernik K, Riefler P: Towards reduced meat consumption: a systematic literature review of intervention effectiveness, 2001–2019. *Appetite* 2022; 168: 105739.
50. Kwaśnicka D, Dombrowski SU, White M, Snihotta F: Theoretical explanations for maintenance of behaviour change: a systematic review of behaviour theories. *Health Psychol Rev* 2016; 10(3): 277–96.
51. Mazar A, Wood W: Defining habit in psychology. In: Verplanken B (ed.): *The psychology of habit: theory, mechanisms, change, and contexts*. Springer 2018; 13–29.
52. Wood W, Neal DT: Healthy through habit: interventions for initiating & maintaining health behavior change. *Behav Sci Policy* 2016; 2(1): 71–83.
53. Gardner B, Arden MA, Brown D, et al.: Developing habit-based health behaviour change interventions: twenty-one questions to guide future research. *Psychology & Health* 2023; 38(4): 518–40.
54. Wood W, Rünger D: Psychology of Habit. *Annu Rev Psychol* 2016; 67: 289–314.
55. Voogt CV, Kuntsche E, Kleinjan M, Poelen EA, Lemmers LA, Engels RC: Using ecological momentary assessment in testing the effectiveness of an alcohol intervention: a two-arm parallel group randomized controlled trial. *PLoS One* 2013; 8(11): e78436.
56. Dunton GF, Rothman AJ, Leventhal AM, Intille SS: How intensive longitudinal data can stimulate advances in health behavior maintenance theories and interventions. *Transl Behav Med* 2021; 11(1): 281–6.
57. Dunton GF: Ecological momentary assessment in physical activity research. *Exerc Sport Sci Rev* 2017; 45(1): 48–54.
58. Perski O, Keller J, Kale D, et al.: Understanding health behaviours in context: a systematic review and meta-analysis of ecological momentary assessment studies of five key health behaviours. *Health Psychol Rev* 2022; 16(4): 576–601.
59. Bolger N, Zee KS: Heterogeneity in temporal processes: implications for theories in health psychology. *Appl Psychol: Health and Well-Being* 2019; 11(2): 198–201.
60. Godin G, Sheeran P, Conner M, et al.: Which survey questions change behavior? Randomized controlled trial of mere measurement interventions. *Health Psychol* 2010; 29(6): 636–44.
61. Morwitz VG, Fitzsimons GJ: The mere-measurement effect: Why does measuring intentions change actual behavior? *J Consum Psychol* 2004; 14(1–2): 64–74.
62. Fuller D, Colwell E, Low J, et al.: Reliability and validity of commercially available wearable devices for measuring steps, energy expenditure, and heart rate: systematic review. *JMIR mHealth uHealth* 2020; 8(9): e18694.
63. Miller DJ, Sargent C, Roach GD: A validation of six wearable devices for estimating sleep, heart rate and heart rate variability in healthy adults. *Sensors* 2022; 22(16): 6317.
64. Karekla M, Demosthenous G, Georgiou C, et al.: Machine learning advances the classification and prediction of responding from psychophysiological reactions. *J Contextual Behav Sci* 2022; 26: 36–43.



65. Rothman AJ, Sheeran P: The operating conditions framework: integrating mechanisms and moderators in health behavior interventions. *Health Psychol* 2021; 40(12): 845–57.
66. Bryan CJ, Tipton E, Yeager DS: Behavioural science is unlikely to change the world without a heterogeneity revolution. *Nat Hum Behav* 2021; 5(8): 980–9.
67. Norris E, Marques MM, Finnerty AN, et al.: Development of an intervention setting ontology for behaviour change: specifying where interventions take place. *Wellcome Open Research* 2020; 5: 124.
68. Mohammed SH, Habtewold TD, Birhanu MM, et al.: Neighbourhood socioeconomic status and overweight/obesity: a systematic review and meta-analysis of epidemiological studies. *BMJ Open* 2019; 9(11): e028238.
69. Chen W, Ren H, Wang N, Xiong Y, Xu F: The relationship between socioeconomic position and health literacy among urban and rural adults in regional China. *BMC Public Health* 2021; 21: 527.
70. Svendsen MT, Bak CK, Sørensen K, et al.: Associations of health literacy with socioeconomic position, health risk behavior, and health status: a large national population-based survey among Danish adults. *BMC Public Health* 2020; 20(1): 565.
71. Sheeran P, Klein WMP, Rothman AJ: Health behavior change: moving from observation to intervention. *Annu Rev Psychol* 2017; 68(1): 573–600.
72. Michie S, West R, Finnerty AN, et al.: Representation of behaviour change interventions and their evaluation: Development of the Upper Level of the Behaviour Change Intervention Ontology [version 2; peer review: 2 approved]. *Wellcome open research* 2021; 5: 123.
73. Flodgren GM, Helleve A, Lobstein T, Rutter H, Klepp K: Primary prevention of overweight and obesity in adolescents: An overview of systematic reviews. *Obesity Reviews* 2020; 21(11). DOI: <https://doi.org/10.1111/obr.13102>.
74. Ronteltap A, Bukman AJ, Nagelhout GE, et al.: Digital health interventions to improve eating behaviour of people with a lower socioeconomic position: A Scoping review of behaviour change techniques. *BMC Nutrition* 2022; 8(1). DOI: <https://doi.org/10.1186/s40795-022-00635-3>.
75. Davidson KW, Scholz U: Understanding and predicting health behaviour change: a contemporary view through the lenses of meta-reviews. *Health Psychol Rev* 2020; 14(1): 1–5.
76. Grundy EAC, Slattery P, Saeri AK, et al.: Interventions that influence animal-product consumption: a meta-review. *Future Foods* 2022; 5: 100111.
77. Ashton LM, Sharkey T, Whatnall MC, et al.: Effectiveness of interventions and behaviour change techniques for improving dietary intake in young adults: a systematic review and meta-analysis of RCTs. *Nutrients* 2019; 11(4). DOI: <https://doi.org/10.3390/nu11040825>.
78. Moore G, Cambon L, Michie S, et al., & Discussion Panel: Population health intervention research: the place of theories. *Trials* 2019; 20(1): 285.
79. Moher D, Schulz KF, Altman DG: The CONSORT statement: revised recommendations for improving the quality of reports of parallel-group randomised trials. *Lancet* 2001; 357(9263): 1191–4.
80. Hoffmann TC, Glasziou PP, Boutron I, et al.: Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. *BMJ* 2014; 348: g1687.
81. Liberati A, Altman DG, Tetzlaff J, et al.: The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *PLoS Medicine* 2009; 6(7): e1000100.
82. Marshall IJ, Johnson BT, Wang Z, Rajasekaran S, Wallace BC: Semi-automated evidence synthesis in health psychology: current methods and future prospects. *Health Psychol Rev* 2020; 14(1): 145–58.
83. Beauchamp A, Backholer K, Magliano D, Peeters A: The effect of obesity prevention interventions according to socioeconomic position: a systematic review. *Obesity Reviews* 2014; 15(7): 541–54.
84. Wowra P, Joanes T, Gwozdz W: In which situations do we eat? A diary study on eating situations and situational stability. *Nutrients* 2023; 15(18): 3967.
85. Hammons AJ, Hannon BA, Teran-Garcia M, et al., & Abriendo Caminos Research Team: Effects of culturally tailored nutrition education on dietary quality of hispanic mothers: a randomized control trial. *J Nutr Educ Behav* 2019; 51(10): 1168–76.
86. Hasan F, Nguyen AV, Reynolds AR, et al.: Preschool- and childcare center-based interventions to increase fruit and vegetable intake in preschool children in the United States: a systematic review of effectiveness and behavior change techniques. *Int J Behav Nutr Phys Act* 2023; 20(1): 66.
87. Kwaśnicka D, Keller J, Perski O, et al.: White paper: open digital health – accelerating transparent and scalable health promotion and treatment. *Health Psychol Rev* 2022; 16(4): 475–91.
88. Fisher AJ, Medaglia JD, Jeronimus BF: Lack of group-to-individual generalizability is a threat to human subjects research. *Proc Natl Acad Sci* 2018; 115(27). DOI: <https://doi.org/10.1073/pnas.1711978115>.
89. Hamaker EL, Dolan CV, Molenaar PC: Statistical modeling of the individual: rationale and application of multivariate stationary time series analysis. *Multivariate Behav Res* 2005; 40(2): 207–33.
90. Hayes SC, Ciarrochi J, Hofmann SG, Chin F, Sahdra BK: Evolving an idionomic approach to processes of change: towards a unified personalized science of human improvement. *Behav Res Ther* 2022; 156: 104155.
91. Moskow DM, Ong CW, Hayes SC, Hofmann SG: Process-based therapy: a personalized approach to treatment. *J Exp Psychopathol* 2023; 14(1): 204380872311528
92. Hekler EB, Tiro JA, Hunter CM, Nebeker C: Precision health: the role of the social and behavioral sciences in advancing the vision. *Ann Behav Med* 2020; 54(11): 805–26.
93. Hill B, Richardson B, Skouteris H: Do we know how to design effective health coaching interventions: a systematic review of the state of the literature. *Am J Health Promot* 2015; 29(5): e158–68.
94. Patrick K, Hekler EB, Estrin D, et al.: The pace of technologic change: implications for digital health behavior intervention research. *Am J Prev Med* 2016; 51(5): 816–24.
95. Murray E, Hekler EB, Andersson G, et al.: Evaluating digital health interventions: key questions and approaches. *Am J Prev Med* 2016; 51(5): 843–51.
96. Chatelan A, Bochud M, Frohlich KL: Precision nutrition: hype or hope for public health interventions to reduce obesity? *Int J Epidemiol* 2019; 48(2): 332–42.
97. Resnicow K, Page SE: Embracing chaos and complexity: a quantum change for public health. *Am J Public Health* 2008; 98(8): 1382–89.
98. Sniehotta FF, Araújo-Soares V, Brown J, Kelly MP, Michie S, West R: Complex systems and individual-level approaches to population health: a false dichotomy? *The Lancet Public Health* 2017; 2(9): e396–7.



99. Hall PA, Fong GT: Temporal self-regulation theory: a model for individual health behavior. *Health Psychol Rev* 2007; 1(1): 6–52.
100. Elliston KG, Ferguson SG, Schüz B: Personal and situational predictors of everyday snacking: an application of temporal self-regulation theory. *Bri J Health Psychol* 2017; 22(4): 854–71.
101. Moore GF, Evans RE, Hawkins J, et al.: From complex social interventions to interventions in complex social systems: future directions and unresolved questions for intervention development and evaluation. *Evaluation* 2019; 25(1): 23–45.
102. Kukowski CA, Hofmann W, Roozenbeek J, van der Linden S, Vandenbergh MP, Nielsen KS: The perceived feasibility of behavior change is positively associated with support for domain-matched climate policies. *One Earth* 2023; 6(11): 1554–63.
103. Nielsen KS, Stern PC, Dietz T, et al.: Improving climate change mitigation analysis: a framework for examining feasibility. *One Earth* 2020; 3(3): 325–36.
104. Hagger MS, Moyers S, McAnally K, McKinley LE: Known knowns and known unknowns on behavior change interventions and mechanisms of action. *Health Psychol Rev* 2020; 14(1): 199–212.
105. Atkins L, Kelly MP, Littleford C, Leng G, Michie S: Reversing the pipeline? Implementing public health evidence-based guidance in english local government. *Implement Sc* 2017; 12(1): 63.
106. Clark J, Glasziou P, Del Mar C, Bannach-Brown A, Stehlik P, Scott AM: A full systematic review was completed in 2 weeks using automation tools: a case study. *J Clin Epidemiol* 2020; 121: 81–90.
107. Michie S, Ball P, Wilsdon J, West R: Lessons from the UK's handling of Covid-19 for the future of scientific advice to government: a contribution to the UK Covid-19 Public Inquiry. *Contemp Soc Sci* 2022; 17(5): 418–33.
108. Michie S, Jochelson K, Markham WA, Bridle C: Low-income groups and behaviour change interventions: a review of intervention content, effectiveness and theoretical frameworks. *J Epidemiol Community Health* 2009; 63(8): 610–22.
109. Jankovič A, Kolenik T, Pejović V: Can personalization persuade? Study of notification adaptation in mobile behavior change intervention application. *Behav Sci* 2022; 12(5): 116.