

Chapter 16

Capabilities and Transdisciplinary Co-production of Knowledge: Linking the Social Practices of Researchers, Policymakers, Professionals and Populations to Promote Active Lifestyles



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16.1 Introduction

Participation and knowledge co-production have been suggested as promising approaches to increase the fitness and sustainability of health promotion interventions in real-world settings. This chapter reports on the experience of Capital4Health, a German research consortium that used a participatory approach to promote and research active lifestyles in various settings across the life course. The consortium's concept of knowledge production and sharing was built on transdisciplinary research (Bergmann et al., 2013), which provides a framework for the interaction of research, policy, practice and population groups. A specific approach to knowledge co-production – the cooperative planning approach (Rütten, 1997; Rütten & Gelius, 2013) – was used to implement transdisciplinary exchange at the setting level. In addition, the consortium employed Sen's capability approach as a unifying theory to conceptualize opportunities for active lifestyles across different contexts.

This chapter outlines the structural set-up, theoretical underpinnings and the intervention and evaluation methods of Capital4Health to illustrate its epistemological framework as well as the main implications of this research ecosystem for future health promotion research.

The authors write on behalf of the Capital4Health Consortium.

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16.2 The Problem: Matching Research to the Needs of the Population in the Promotion of Physical Activity

Sustainably promoting health in real-world settings and conditions is one of the central challenges of health promotion. Numerous interventions designed, implemented and evaluated in a research context fail to be “institutionalized” (Finewood et al., 2014; Steckler & Goodman, 1989) or widely implemented, thereby leading to no tangible public health impact (Glasgow et al., 1999).

Consequently, researchers have advocated in favour of more effective solutions to match scientific evidence with the actual prerequisites and demands for health promotion in different settings (Leask et al., 2019). There is growing evidence that health promotion interventions are particularly effective and sustainable when population group members, multipliers and key actors are actively involved in programme planning and implementation (Cornwall, 2008; WHO, 2009; Max-Rubner-Institut, 2013).

Participatory research has been identified as a tool to achieve change by involving end users in creating public health interventions, thereby better adapting them to people’s needs and increasing programme adherence, functionality and effectiveness, on the one hand (Green et al., 2016), and reducing health inequalities, on the other (Arcaya et al., 2015; Marmot, 2005; O’Mara-Eves et al., 2015). One important approach in this context is knowledge co-creation, which has its roots in the research aimed at strengthening the evidence base of public health (Ham et al., 1995; WHO, 1998) and in the utilization of scientific knowledge by policymakers (Weiss, 1979). There is agreement among researchers that approaches that attempt to directly “transfer” scientific evidence into policy or to “translate” findings into the language of policymaking are insufficient (Black, 2001; Davies et al., 2008; Nutbeam, 2003) and that more interactions between research, policy and practice are required to ensure that knowledge leads to sustainable action (Brownson et al., 2009; Nutley et al., 2007). Notable theoretical approaches, such as interactive knowledge transfer (Canadian Institutes of Health Research, 2010; Rütten & Gelius, 2013), knowledge co-production (Aeberhard & Rist, 2009) and transdisciplinary research (Bergmann et al., 2013), focus on intervention formats that connect experts and setting representatives to jointly develop strategies for health promotion (Minkler, 2005; Wallerstein & Duran, 2006; Israel et al., 2008).

A thematic area for which these approaches have become increasingly important in recent years is insufficient physical activity, which has been identified as a core public health problem of the twenty-first century (Blair, 2009). Multiple positive health outcomes of physical activity are well documented (WHO, 2009; Lee et al., 2012), and physical activity is considered a key component of a healthy lifestyle (CSDH, 2008). However, despite increasing efforts to promote physical activity and reduce sedentary lifestyles in recent years, physical activity prevalence rates across the world are alarmingly low (Guthold et al., 2018). Further, changing physical activity behaviour is difficult, as it is determined by a variety of factors on multiple levels, including individual (e.g. motivation and competence), social (e.g. support

from friends and family), infrastructural (e.g. availability of bike lanes) and political (e.g. existence of national recommendations) variables (Dahlgren & Whitehead, 1991; Sallis et al., 2006). Consequently, researchers and practitioners who aim to promote physical activity are facing the challenge of harnessing knowledge co-production to better tailor interventions to settings and population groups, thereby increasing the impact and sustainability of their efforts (Rütten et al., 2009; Rütten & Gelius, 2013; Zwass, 2010).

16.3 The Capital4Health Consortium

The Capital4Health consortium aims to address the above-mentioned issues by employing knowledge co-production in multiple settings to sustainably promote capabilities for establishing active lifestyles among population groups and other stakeholders. The German Federal Ministry of Education and Research provided funding for a 7-year period (2015–2022), specifically requiring projects to be built on the exchange between different research disciplines and non-academic actors (Bundesministerium für Bildung und Forschung, 2013).

The consortium was developed in 2013 following a call from the Ministry to establish research consortia in the field of primary prevention and health promotion. The call specifically requested the use of interdisciplinary approaches and the inclusion of relevant practitioners from respective fields (Bundesministerium für Bildung und Forschung, 2013). However, the logic of research funding continues to emphasize defining project goals, theories, interventions and measurement tools upfront. Consequently, most major project objectives and tenets of Capital4Health had to be formulated before non-academic actors could be involved. Consortium researchers attempted to offset this problem by building on their previous experience with similar projects and used their own funds to maximize collaboration during project development.

The resulting design process had a primarily interdisciplinary (i.e. academia-oriented) focus. Four preparatory workshops were conducted with potential research partners from a variety of disciplinary backgrounds (including sport science, public health and social science). A representative of the state agency responsible for health promotion also participated in one of these workshops. In addition, external academic experts were invited for several meetings to discuss the theoretical foundations of the consortium. Then, researchers selected key population groups and settings for the promotion of physical activity across the life course and developed initial outlines for the six projects of the consortium. Following this, they approached partners from policy and practice who provided expressions of interest to join Capital4Health in the case of a successful grant application. Once the proposal was accepted, a final kick-off meeting was conducted with partners from academia, policy and practice.

The final set-up of the Capital4Health consortium consisted of four intervention projects dedicated to promoting active lifestyles using co-production in four

Table 16.1 The Capital4Health consortium

Project	Setting	Population group addressed	Main goal
<i>QueB</i>	Fourteen childcare centres	Pre-school children	Creating more physical activity-friendly environments in childcare centres
<i>Health. Edu</i>	Six schools, two universities	Schoolchildren	Enhancing physical literacy among schoolchildren by improving the teaching process of physical education (PE) teaching and providing PE teacher education
<i>PARC-AVE</i>	One car manufacturing company, one public nursing school	Apprentices in vocational training	Improving health competence related to physical activity among young adults in vocational training
<i>Action for men</i>	Two rural communities	Community-dwelling men over the age of 50 years	Improving physical activity offers and infrastructures for men aged over 50 years
<i>CAPCOM</i>	Consortium level	–	Improving theory input, project support and consortium-level knowledge co-production
<i>EVA</i>	Consortium level	–	Supporting consortium-wide evaluation of project results

Adapted from Gelius, P., Brandl-Bredenbeck, H.P., Hassel, H., et al. (2021). Kooperative Planung von Maßnahmen zur Bewegungsförderung. *Bundesgesundheitsbl*, 64, 187–198, Table 1. 10.1007/s00103-020-03263-z, licensed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>)

settings: childcare centres, schools, vocational training and communities (see Table 16.1). In addition, there are two cross-cutting projects that support interaction and co-production among researchers at the consortium level. The CAPCOM project provides theoretical input and practical support and leads an intervention to foster consortium-wide interaction among projects as well as among the areas of research, policy and practice. The EVA (evaluation) project supports consortium-wide evaluation. Thus, Capital4Health provides unique and valuable insights for both students and practitioners of health promotion on how knowledge co-creation and sharing may be used effectively to implement physical interventions in multiple real-world settings across the life course.

Capital4Health is based on the idea that active lifestyles – and, by extension, knowledge related to active lifestyles – are not achieved by individuals alone but are co-produced by a variety of actors and their specific social practices (Rütten et al., 2019). Social practice is a concept that is widely used across disciplinary boundaries and is defined in our context as “everyday actions and interactions in specific settings that shape an individual’s agency and choice” (Rütten et al., 2019, p. 48). Capital4Health particularly focuses on the interplay of social practices of four groups of actors:

(1) *Academics*: The consortium comprises seven core research institutions from Southern Germany that are directly funded by the German government. Seven additional institutions (two German and five international) provide research support to the consortium. Researchers from eight institutions (two German and six international) act as members of the Scientific Advisory Board.

(2) *Stakeholders, professionals and (3) policymakers*: A total of 49 partners from the fields of health promotion policy and practice are involved in the consortium. These include Bavarian regional ministries and state agencies; city, county or district administrations; national or regional NGOs; chambers of commerce, unions or industry think tanks; private companies and educational institutions (including kindergartens and schools). All policy and practice partners are assigned to one of the four intervention projects of Capital4Health.

(4) *Population group representatives*: The size of the population groups potentially reached by the Capital4Health projects in different settings amounted to $N = 9247$ (1020 in QueB, 3011 in Health.edu, 2216 in PARC-AVE and an estimated 3000 in Action for Men (A4M)) (Gelius et al., 2021). Members of population groups were not only the addressees of interventions in Capital4Health, but their representatives were involved in the actual measure development. This specifically included secondary school students (in Health.edu), apprentices of automotive mechatronics and nursing (PARC-AVE) and community-dwelling men over the age of 50 years (A4M). In A4M, it was difficult to distinguish professional stakeholders from population group members: several practitioners, policymakers and NGO representatives were members of the involved population group, thereby fulfilling a dual role. Further, PE students participated in measure development in the university setting of health.edu but were not counted as population group members (secondary school students). In QueB, population group members (pre-school children) were considered too young to partake in the planning process.

16.4 The Capital4Health Research Framework

In terms of the interaction and potential co-production processes among population groups, professionals, policymakers and researchers, the Capital4Health consortium is built on an interactive exchange between academic and non-academic actors, dubbed in the broader literature as “transdisciplinarity” (e.g. Bergmann et al., 2013; Jahn et al., 2012, 2019; Krohn et al., 2017, 2019; Mittelstraß, 2018). Recently, these ideas have also been picked up by discourses in the public health community, such as knowledge-to-action and interactive knowledge transfer (Holmes et al. 2016; Rütten & Gelius, 2013; Canadian Institutes of Health Research, 2010; Jansen et al., 2012; Stokols et al., 2013).

For Capital4Health, we developed and adapted the concept of transdisciplinary research to initiate knowledge co-production (Rütten et al., 2019) based on different models of aligning the social practices of population groups, practitioners, policymakers and researchers to co-produce knowledge for healthy lifestyles. The

scenarios range from traditional push/pull models (Weiss, 1979) – via a pragmatic “development model” that remains research-driven and is mostly focused on co-production among academics, professionals and policymakers – to an “ideal” approach that leads to the creation of an equal partnership among population groups, practitioners, policymakers and researchers. While the consortium aimed at achieving this ideal interaction model, the actual design of the Capital4Health projects most closely matches the development model, with a clear focus on researchers, policymakers and practitioners. As shown below, population group members have been successfully involved in most settings, albeit not as intensely as expected in the design stage.

The other central approach, employed to conceptualize the determinants of physical activity behaviour across domains, was the concept of “capabilities”. This approach originated in economics (Sen, 1993) but is increasingly recognized in health promotion as well (Abel & Frohlich, 2012; Ruger, 2010; Van Ootegem & Verhofstadt, 2012). It shifts the focus from people’s behaviour (“functioning and being”) to the range of options (“capabilities”) that they can choose from to live life in the manner they desire. Merely having a greater variety of options is considered to increase well-being, even if an individual eventually does not choose a “healthy” behaviour (Abel & Frohlich, 2012). Sen (1993) considers capabilities to be shaped by both social/structural factors (e.g. material resources, societal norms, laws and regulations and infrastructures) and individual competences (e.g. knowledge, skills and motivation), thereby allowing for linking the capability approach to concepts such as Giddens’s structure and agency theory (Giddens, 1984), Weber’s concept of lifestyles and Bourdieu’s idea of different types of capital (Abel & Frohlich, 2012). An adapted version of the capability approach has been developed in the CAPCOM project for use in Capital4Health, conceptualizing both individuals’ capabilities for creating active lifestyles and the potential (“agency”) of population groups, health promoters and policymakers to influence the promotion of physical activity in their environments (Frahsa et al., 2020).

16.5 Specific Interventions at the Project/Setting and Consortium Levels

In order to link the social practices of the relevant groups of actors in Capital4Health, the consortium pursued a two-pronged approach with separate interventions at the consortium and the project/setting levels. At the project level, Capital4Health employed the cooperative planning approach (Rütten, 1997; Rütten & Gelius, 2013), which comprises a planning group of representatives from all the four above-mentioned groups of social actors that interact to develop and oversee the implementation of measures tailored to the specific setting and needs of the involved population groups. It employs a predefined sequence of three phases: preparation, development and implementation. The core development phase consists of four to

six meetings to brainstorm and prioritize ideas, develop specific measures and agree on an action plan and monitor its implementation. Project researchers typically act in a dual capacity as organizers/moderators of the process and as physical activity experts. Typical outputs may be media campaigns, group-specific programmes, infrastructure development or changes in access rules for physical activity facilities. The concept has been successfully used in a variety of both sport-related contexts – for example, talent identification or the development of a sports facility (Rütten et al., 2005) – and physical activity promotion projects – for example, for women in difficult life situations (Frahsa et al., 2012; Rütten & Pfeifer, 2016) or sedentary older people (Rütten & Gelius, 2013).

Overall, a total of 144 planning sessions were conducted in 22 separate intervention sites across the four participatory intervention projects. A few projects addressed more than one sub-setting (e.g. physical education classes and teacher education, vocational training in automotive mechatronics and nursing) or different geographical regions (childcare centres and communities in different Bavarian counties). Research teams prepared the processes by contacting the key actors well in advance (and occasionally repeatedly), by conducting informational meetings to get to know the partners and raise their awareness of physical activity and by creating systematic context analyses according to the setting.

The four projects' planning groups showed a broad spectrum of group set-ups and processes, ranging from smaller groups in childcare and school settings (with a minimum of four participants) to very large groups of up to 20 individuals in vocational education and community settings. All projects attempted to involve the full spectrum of relevant stakeholders, including both the leadership and “working level” of organizations and representatives of the involved population groups. However, the latter groups were not accessible in all settings, notably the childcare setting, where children were considered too young to participate in a structured planning process. In addition, given the need to limit group sizes, the average number of population group representatives participating in the planning groups remained limited, ranging from one to six representatives. The number of sessions also varied substantially. While a few processes (e.g. in the vocational training setting) required the conduct of the minimum number of sessions prescribed by the cooperative planning approach ($n = 4$), others exceeded this number by far (e.g. the community setting with up to 10 sessions). Most processes took between 6 and 18 months to complete. Projects also adapted the planning process to the needs of the setting – for example, achieving a common understanding of central concepts at the beginning of the project (Health.edu) or the use of certain self-evaluation tools (e.g. a web-based self-check application in QueB).

One central element in cooperative planning is that its impact is not primarily generated by the planning process as such but by the specific measures developed by the planning group, which vary depending on the setting, participants and the course of the process. Across different sites, Capital4Health generated a broad spectrum of measures to promote capabilities for physical activity, ranging from general organizational guidelines (e.g. vision statements or the adoption of a physical activity-friendly language) via one-off events (workshops, info events) to

specific physical activity programmes, curriculum changes and monetary subsidies for participation in sports programmes.

At the consortium level, the CAPCOM project developed and implemented a dedicated intervention to foster collaboration among projects, research groups and certain policy/practice partners, which included the following components:

- Ongoing support to the intervention projects, including: (a) regular debriefing interviews with all research teams on the status of their projects, accomplishments and challenges as well as interaction with the project partners; (b) a central digital infrastructure for the consortium with a web-based data repository, an internal Wiki with a glossary of central terminology and a consortium website (www.capital4health.de) and (c) several workshops that were open to all consortium researchers on capabilities, transdisciplinarity, cooperative planning and health economic evaluation.
- A scientific advisory board with eight internationally renowned researchers from the fields of physical activity, health promotion and health economics met annually with the entire Capital4Health research team to discuss project progress, theories, interventions, methods and publications.
- A council of speakers with all principal investigators met every 6 months to discuss consortium strategies, handle project administration and resolve conflicts where necessary.
- A young researchers network was formed to support exchange among graduate students and postdoctoral fellows who were part of the projects. Activities included semi-annual meetings, a summer school and a joint special issue in an international scientific journal.
- A transdisciplinary steering committee, including the principal investigators and select partners from policy and practice recruited from the projects to foster knowledge co-production at the consortium level, was set up. The topics addressed by this committee included problems shared across projects, the practice-oriented dissemination of project results and the creation of permanent structures for the promotion of physical activity beyond the lifetime of the consortium.

16.6 Evaluating Intervention Effects

To evaluate the participatory build-up of new capabilities for physical activity, the consortium collected data from both within each individual project and at the consortium level, using a variety of quantitative and qualitative methods.

To evaluate the effects of their planning processes as well as the resulting measures developed and implemented, all projects conducted their own research. The research foci varied depending on the setting and the researchers' disciplinary backgrounds. The questions researched ranged from the build-up of physical literacy/competences to the build-up of infrastructure and organizational capacities, sport participation and general physical activity behaviour. Projects also used a variety of

qualitative and quantitative outcome measures, including self-assessments, qualitative interviews, knowledge tests, surveys, observations and pedometers. The two cross-cutting projects conducted additional evaluations. The EVA project developed and pilot-tested a tool to evaluate the development of organizational capacities during the cooperative planning processes (Sauter et al., 2020). The CAPCOM project conducted a Delphi process to draw joint conclusions on researchers' experiences with the approach (Till et al., [under review](#)).

Overall, the results indicate that interventions contributed to improvements in various dimensions of organizational capacity in the PARC-AVE project (Popp et al., 2020) and A4M (Loss et al., 2020). They also helped improve the skills of nursing school teachers in the QueB project (Müller et al., 2019) and significantly improved the physical literacy of high school students in Health.edu (Sygusch et al., 2020; Ptack, 2019). Finally, the measures implemented on the basis of the planning processes in the QueB childcare centres led to a significant increase in the average number of steps per hour among both children and staff (Müller et al., 2019).

At the consortium level, we analyzed project-related documents and took minutes of consortium meetings to document interactions and knowledge co-production over time. In addition, we investigated cooperation and co-production of scientific outputs in the consortium based on Hall et al.'s (2008) model of collaborative readiness, collaborative capacity and collaborative outcomes (Ferschl et al., 2021). For this, we conducted semi-structured interviews with project researchers and analyzed the collaborative products of Capital4Health, such as joint publications and co-supervised MA or PhD theses.

The results indicate that collaborative readiness was fostered by researchers' previous experience with interdisciplinary projects, the geographical proximity of the research groups and a general inclination towards scientific collaboration (Ferschl et al., 2021). On the other hand, scarce resources, a lack of structured planning and limited trust challenged team cooperation in the early project phases. However, by the end of the project, teams reported an increased sense of unity. Scientific publications were mostly produced by individual project teams at the beginning of Capital4Health, but the co-production of outputs increased in the subsequent stages (e.g. Gelius et al., 2020). In addition, project groups perceived the evaluation support received from the EVA project as well as the intervention of the CAPCOM project as important facilitators for the success of the consortium. These findings emphasize the importance of a coordinating entity that provides structured support for exchange and collaboration for complex research initiatives.

The analysis of project documentation revealed that (a) knowledge co-production in the design/proposal-writing phase of the consortium was mostly limited to researchers, while policy and practice partners could be recruited but were not actively involved due to lack of funding; (b) the common theory base was modified by all intervention projects to fit their setting, planning group participants and own disciplinary backgrounds; (c) a common language and understanding was slowly developed with consortium meetings acting as "catalytic events" that stimulated exchange and awareness and (d) involving professionals and policymakers in co-production processes was much more difficult at the consortium level than in individual projects.

16.7 Conclusions

The analysis of Capital4Health provides important insights and lessons for health promotion research and practice. The results from individual projects shed light on the effectiveness and sustainability of specific interventions to promote physical activity in different settings. These results may also help clarify how specific capabilities contribute to healthier lifestyles in different population groups and what professionals and policymakers require to support these groups. At a more general level, the consortium provides important evidence on the utility, feasibility and effects of cooperative planning and other forms of transdisciplinary interaction in health promotion activities. Finally, the results of the consortium may foster the development of health promotion theory (capabilities and transdisciplinarity) and methods (measurement of capabilities, physical literacy, organizational readiness, academic collaboration and health economic aspects).

With regard to the implementation of an approach that fosters co-production, the consortium arrived at the following conclusions (Gelius et al., 2020):

1. Cooperative planning can be effectively utilized to promote health across different settings, but it must be (and can be) adapted to match the respective context.
2. Physical activity (like other health behaviours) does not necessarily take a front seat in many settings, and it is important to raise awareness and build capacities for addressing this aspect.
3. Setting readiness for change is a decisive factor for success, and researchers must ascertain actors' readiness at an early stage (Edwards et al., 2000; Gansefort et al., 2018) and adapt their interventions accordingly.
4. Involving population groups in output-oriented knowledge co-production is challenging, and adapted approaches may be necessary to maximize the number of individuals involved.

Individual actors or “champions” (O’Loughlin et al., 1998; Greenhalgh et al., 2016) may be key to project success. Attempts to identify champions must be made early in the process. With regard to the interaction at the consortium level, a consortium design like the one used in Capital4Health can substantially foster interdisciplinary cooperation among researchers from different disciplines. A common theory and shared methods can be valuable assets for working across different settings and population groups, provided that there is sufficient flexibility that enables adaptations to different contexts and disciplines. However, sufficient resources are required for this. There must be no overly optimistic assumptions regarding the speed of the integration process. In addition, integrating representatives of population groups and other stakeholders into research coordination at the consortium level remains a challenge that must be addressed in future projects.

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References

- Abel, T., & Frohlich, K. (2012). Capitals and capabilities: Linking structure and agency to reduce health inequalities. *Social Science and Medicine*, 74(2), 236–244.
- Aeberhard, A., & Rist, S. (2009). Transdisciplinary co-production of knowledge in the development of organic agriculture in Switzerland. *Ecological Economics*, 68(4), 1171–1181.
- Arcaya, M. C., Arcaya, A. L., & Subramanian, S. V. (2015). Inequalities in health: Definitions, concepts, and theories. *Global Health Action*, 8, 27106. <https://doi.org/10.3402/gha.v8.27106>
- Bergmann, M., Jahn, T., Knobloch, T., Krohn, W., Pohl, C., & Schramm, E. (2013). *Methods for transdisciplinary research: A primer for practice*. Campus Verlag.
- Black, N. (2001). Evidence based policy: Proceed with care. *British Medical Journal*, 323(7307), 275. <https://doi.org/10.1136/bmj.323.7307.275>
- Blair, S. N. (2009). Physical inactivity: The biggest public health problem of the 21st century. *British Journal of Sports Medicine*, 43(1), 1–2.
- Brownson, R. C., Chiqui, J. F., & Stamatakis, K. A. (2009). Understanding evidence-based public health policy. *American Journal of Public Health*, 99(9), 1576–1583. <https://doi.org/10.2105/AJPH.2008.156224>
- Bundesministerium für Bildung und Forschung (2013). *Bekanntmachung des Bundesministeriums für Bildung und Forschung: Richtlinien zur Förderung von Forschungsverbänden zur Primärprävention und Gesundheitsförderung* [Call by the federal ministry of research and education: Guidelines on funding of research consortia for primary prevention and health promotion]. <https://www.bmbf.de/foerderungen/bekanntmachung-859.html>. Accessed 14 Apr 2019.
- Canadian Institutes of Health Research. (2010). *Knowledge to action: An end-of-grant knowledge translation casebook*. CIHR.
- Cornwall, A. (2008). Unpacking “participation”: Models, meanings and practices. *Community Development Journal*, 43(3), 269–283. <https://doi.org/10.1093/cdj/bsn010>
- CSDH. (2008). *Closing the gap in a generation: Health equity through action on the social determinants of health. Final report of the commission on social determinants of health*. WHO.
- Dahlgren, G., & Whitehead, M. (1991). *Policies and strategies to promote social equity in health*. WHO Regional Office for Europe, (document EUR/icp/rpd 414(2)9866n).
- Davies, H., Nutley, S., & Walter, I. (2008). Why “knowledge transfer” is misconceived for applied social research. *Journal of Health Services Research & Policy*, 13(3), 188–190. <https://doi.org/10.1258/jhsrp.2008.008055>
- Edwards, R. W., Jumper-Thurman, P., Plestred, B. A., Oetting, E. R., & Swanson, L. (2000). Community readiness: Research to practice. *Journal of Community Psychology*, 28(3), 291–307.
- Ferschl, S., Allmeta, A., Fleuren, T., Weege, M., Abu-Omar, K., & Gelius, P. (2020). Scaling-up auch in der Bewegungsförderung? Konzepte, Handlungsleitfäden und praktische Tipps zur Verbreitung erfolgreicher Interventionen [The role of scaling up in the promotion of physical activity: Concepts, guidelines and practical tips for disseminating successful interventions]. *Bewegungstherapie und Gesundheitssport*, 36. <https://doi.org/10.1055/a-1153-5882>
- Ferschl, S., Till, M., Abu-Omar, K., Pfeifer, K., & Gelius, P. (2021). Scientific cooperation and co-production of scientific outputs for physical activity promotion: Results from a transdisciplinary research consortium. *Frontiers of Public Health*. <https://doi.org/10.3389/fpubh.2021.604855>
- Finegood, D., Johnston, L., Steinberg, M., Matteson, C., & Deck, P. (2014). Complexity, systems thinking, and health behavior change. In S. Kahan, A. Gielen, P. Fagan, & L. Green (Eds.), *Health behavior change in populations* (pp. 435–458). Johns Hopkins University Press.
- Frahsa, A., Rütten, A., Röger, U., Abu-Omar, K., & Schow, D. (2012). Enabling the powerful? Participatory action research with local policymakers and professionals for physical activity promotion with women in difficult life situations. *Health Promot International*, 29(1), 171–184. <https://doi.org/10.1093/heapro/das050>

- Frahsa, A., Abel, T., Gelius, P., & Rütten, A. (2020). Locating capabilities and agency for active lifestyle promotion: An analytical framework to guide research on physical activity interventions. *Health Promotion International*. <https://doi.org/10.1093/heapro/daaa076>
- Gansefort, D., Brand, T., Princk, C., & Zeeb, H. (2018). Community readiness for the promotion of physical activity in older adults—a cross-sectional comparison of rural and urban communities. *International Journal of Environmental Research and Public Health*, 15(3). <https://doi.org/10.3390/ijerph15030453>
- Gelius, P., Hassel, H., Loss, J., Sygusch, R., Tittlbach, S., Töpfer, C., Ungerer-Röhrich, U., & Pfeifer, K. (2020). Kooperative Planung zur Erweiterung von Handlungsmöglichkeiten für Bewegung: Ergebnisse aus dem Forschungsverbund Capital4Health [Cooperative planning of measures to promote physical activity: New paths for expanding capabilities – Results from the Capital4Health research consortium]. *Bundesgesundheitsblatt*. <https://doi.org/10.1007/s00103-020-03263-z>
- Gelius, P., Sommer, R., Abu-Omar, K., Schätzlein, V., & Suhrcke, M. (2021). Toward the economic evaluation of participatory approaches in health promotion: Lessons from four German physical activity promotion projects. *Health Promotion International*, 36(S2):ii79–92. <https://doi.org/10.1093/heapro/daab158>
- Giddens, A. (1984). *The constitution of society: Outline of the theory of structuration*. University of California Press.
- Glasgow, R. E., Vogt, T. M., & Boles, S. M. (1999). Evaluating the public health impact of health promotion interventions: The RE-AIM framework. *American Journal of Public Health*, 89(9), 1322–1327. <https://doi.org/10.2105/ajph.89.9.1322>
- Green, L. W., O'Neill, M., Westphal, M., & Morisky, D. (2016). The challenges of participatory action research for health promotion. *Promotion & Education*, 3(4), 3. <https://doi.org/10.1177/102538239600300401>
- Greenhalgh, T., Jackson, C., Shaw, S., & Janamian, T. (2016). Achieving research impact through co-creation in community-based health services: Literature review and case study. *The Milbank Quarterly*, 94, 392–429.
- Guthold, R., Stevens, G. A., Riley, L. M., & Bull, F. C. (2018). Worldwide trends in insufficient physical activity from 2001 to 2016: A pooled analysis of 358 population-based surveys with 1.9 million participants. *The Lancet Global Health*, 6(10), e1077–e1086. [https://doi.org/10.1016/s2214-109x\(18\)30357-7](https://doi.org/10.1016/s2214-109x(18)30357-7)
- Hall, K. L., Stokols, D., Moser, R. P., Taylor, B. K., Thornquist, M. D., Nebeling, L. C., et al. (2008). The collaboration readiness of transdisciplinary research teams and centers: Findings from the National Cancer Institute's TREC year-one evaluation study. *American Journal of Preventive Medicine*, 35(2), S161–S172.
- Ham, C., Hunter, D. J., & Robinson, R. (1995). Evidence based policymaking. *British Medical Journal*, 310(6972), 71–72. <https://doi.org/10.1136/bmj.310.6972.71>
- Holmes, B., Best, A., Davies, H., Hunter, D. J., Kelly, M., Marshall, M., & Rycroft-Malone, J. (2016). Mobilising knowledge in complex health systems: A call to action. *Evidence and Policy*, 13, 539–560.
- Israel, B. A., Schultz, A. J., Parker, E. A., & Becker, A. B. (2008). Critical issue in developing and following community based participatory research principles. In M. Minkler & N. Wallerstein (Eds.), *Community-based participatory research for health* (pp. 47–62). Jossey-Bass.
- Jahn, T., Bergmann, M., & Keil, F. (2012). Transdisciplinarity: Between mainstreaming and marginalization. *Ecological Economics*, 79, 1–10.
- Jahn, T., Keil, F., & Marg, O. (2019). Transdisziplinarität: zwischen Praxis und Theorie [Transdisciplinarity: Between practice and theory]. *GAIA*, 28, 16–20.
- Jansen, M., de Leeuw, E., Hoeijmakers, M., & de Vries, N. K. (2012). Working at the nexus between public health policy, practice and research. Dynamics of knowledge sharing in the Netherlands. *Health Research Policy and Systems*, 10(1), 1–12.
- King, A., Winter, S. J., Sheats, J. L., Rosas, L. G., Buman, M. P., Salvo, D., Rodriguez, N. M., ... Dommarco, J. R. (2016). Leveraging citizen science and information technology for population

- physical activity promotion. *Translational Journal of the American College of Sports Medicine*, 1(4), 30–44.
- Krohn, W., Grunwald, A., & Ukowitz, M. (2017). Transdisziplinäre Forschung revisited: Erkenntnisinteresse, Forschungsgegenstände, Wissensform und Methodologie [Transdisciplinary research revisited: Epistemological interest, objects of research, form of knowledge and methodology]. *GAIA*, 26(4), 341–347.
- Krohn, W., Grunwald, A., & Ukowitz, M. (2019). Transdisziplinäre Forschung kontrovers – Antworten und Ausblicke [Controversial transdisciplinary research – Answers and outlook]. *Gaia*, 28(1), 21–25.
- Leask, C. F., Sandlund, M., Skelton, D. A., Altenburg, T. M., Cardon, G., Chinapaw, M. J. M., ... Teenage Girls on the Move Research. (2019). Framework, principles and recommendations for utilising participatory methodologies in the co-creation and evaluation of public health interventions. *Research Involvement and Engagement*, 5, 2. <https://doi.org/10.1186/s40900-018-0136-9>
- Lee, I. M., Shiroma, E. J., Lobelo, F., Puska, P., Blair, S. N., Katzmarzyk, P. T., & Lancet Physical Activity Series Working Group. (2012). Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of disease and life expectancy. *Lancet (London, England)*, 380(9838), 219–229. [https://doi.org/10.1016/S0140-6736\(12\)61031-9](https://doi.org/10.1016/S0140-6736(12)61031-9)
- Loss, J., Brew-Sam, N., Metz, B., Strobl, H., Sauter, A., & Tittlbach, S. (2020). Capacity building in community stakeholder groups for increasing physical activity: Results of a qualitative study in two German communities. *International Journal of Environmental Research and Public Health*, 17(7), 2306. <https://doi.org/10.3390/ijerph17072306>
- Marmot, M. (2005). Social determinants of health inequalities. *Lancet*, 365(9464), 1099–1104. [https://doi.org/10.1016/s0140-6736\(05\)71146-6](https://doi.org/10.1016/s0140-6736(05)71146-6)
- Max-Rubner-Institut (2013) *Evaluation des Modellvorhabens „Besser essen. Mehr bewegen. KINDERLEICHT-Regionen“*. Zentrale Ergebnisse und Empfehlungen für Entscheider, Projektförderer und Projektnehmer [Evaluation of the pilot program „Better eating. More physical activity. KINDERLEICHT Regions“. Central results and recommendations for policymakers, funding agencies and applicants]. Max-Rubner-Institut.
- Minkler, M. (2005). Community-based research partnerships: Challenges and opportunities. *Journal of Urban Health : Bulletin of the New York Academy of Medicine*, 82(2 Suppl 2), 3–12.
- Mittelstraß, J. (2018). Forschung und Gesellschaft. Von theoretischer und praktischer Transdisziplinarität [Research and society: On theoretical and practical transdisciplinarity]. *GAIA*, 27(2), 201–204.
- Müller, C., Foitzik, E., & Hassel, H. (2019). Bewegte Kitas durch Organisationsentwicklung [active childcare centers through organizational development]. *Prävention und Gesundheitsförderung*, 15, 50–55. <https://doi.org/10.1007/s11553-019-00737-0>
- Nutbeam, D. (2003). How does evidence influence public health policy? Tackling health inequalities in England. *Health Promotion Journal of Australia*, 14(3), 154–158. <https://doi.org/10.1071/HE03154>
- Nutley, S. M., Walter, I., & Davies, H. T. O. (2007). *Using evidence: How research can inform public services* (Vol. 16). Policy Press.
- O’Loughlin, J., Renaud, L., Richard, L., Gomez, L. S., & Paradis, G. (1998). Correlates of the sustainability of community-based heart health promotion interventions. *Preventive Medicine*, 27, 702–712.
- O’Mara-Eves, A., Brunton, G., Oliver, S., Kavanagh, J., Jamal, F., & Thomas, J. (2015). The effectiveness of community engagement in public health interventions for disadvantaged groups: A meta-analysis. *BMC Public Health*, 15, 129. <https://doi.org/10.1186/s12889-015-1352-y>
- Popp, J., Carl, J., Grüne, E., Semrau, J., Gelius, P., & Pfeifer, K. (2020). Physical activity promotion in vocational education: Does capacity building work? *Health Promotion International*, daaa014. <https://doi.org/10.1093/heapro/daaa014>
- Prochaska, J. M., Prochaska, J. O., & Levesque, D. A. (2001). A Transtheoretical approach to changing organizations. *Ad Policy Men Health*, 28(4), 247–261.

- Ptack K. (2019). Eine Interventionsstudie zum Thema Gesundheit im Sportunterricht: Evaluation eines kooperativen Planungsprozesses in der Health.edu-Studie [An intervention study on the topic of health in physical education: Evaluation of a cooperative planning process in the health.edu study]. Feldhaus.
- Ruger, J. P. (2010). Health capability: Conceptualization and operationalization. *American Journal of Public Health, 100*(1), 41–49.
- Rütten, A. (1997). Kooperative Planung und Gesundheitsförderung. Ein Implementationsansatz [Cooperative planning and health promotion: An implementation approach]. *Zeitschrift für Gesundheitswissenschaft, 257–272*.
- Rütten, A., & Gelius, P. (2013). Building policy capacities: An interactive approach for linking knowledge to action in health promotion. *Health Promotion International, 29*(3), 569–582.
- Rütten, A., & Pfeifer, K. (Eds.). (2016). *National recommendations for physical activity and physical activity promotion*. FAU University Press.
- Rütten, A., Ziemainz, H., & Röger, U. (2005). *Qualitätsgesichertes system der Talentsuche, –auswahl und –förderung* [Quality-assured system of talent selection, identification and development]. Sport und Buch Strauß.
- Rütten, A., Abu-Omar, K., Frahsa, A., & Morgan, A. (2009). Assets for policy-making in health promotion: Overcoming political barriers inhibiting women in difficult life situations to access sport facilities. *Social Science and Medicine, 69*, 1667–1673.
- Rütten, A., Frahsa, A., Abel, T., Bergmann, M., de Leeuw, E., Hunter, D., Jansen, M., King, A., & Potvin, L. (2019). Co-producing active lifestyles as whole-system-approach: Theory, intervention and knowledge-to-action implications. *Health Promotion International, 34*(1), 47–59.
- Sallis, J. F., Cervero, R. B., Ascher, W., Henderson, K. A., Kraft, M. K., & Kerr, J. (2006). An ecological approach to creating active living communities. *Annual Review of Public Health, 27*, 297–322.
- Sauter, A., Lindacher, V., Rueter, J., Curbach, J., & Loss, J. (2020). How health promoters can assess capacity building processes in setting-based approaches – Development and testing of a monitoring instrument. *International Journal of Environmental Research and Public Health, 17*(2), 407. <https://doi.org/10.3390/ijerph17020407>
- Sen, A. (1993). Capability and Well-being. In M. Nussbaum & A. Sen (Eds.), *The quality of life*. Clarendon Press.
- Steckler, A., & Goodman, R. M. (1989). How to institutionalize health promotion programs. *American Journal of Health Promotion, 3*(4), 34–43. <https://doi.org/10.4278/0890-1171-3.4.34>
- Stokols, D., Hall, K. L., & Vogel, A. L. (2013). Transdisciplinary public health: Core characteristics, definitions, and strategies for success. In D. Haire-Joshu & T. D. McBride (Eds.), *Transdisciplinary public health: Research, methods, and practice* (pp. 3–30). Jossey-Bass Publishers.
- Strobl, H., Brew-Sam, N., Curbach, J., Metz, B., Tittlbach, S., & Loss, J. (2020). ACTION for men: Study protocol of a community capacity building intervention to develop and implement gender-sensitive physical activity programs for men 50 plus. *Frontiers in Public Health, 8*, 4.
- Sygyusch, R., Brandl-Bredenbeck, H.P., Tittlbach, S., Ptack, K., Töpfer, C. (2020). *Gesundheit in Sportunterricht und Sportlehrerbildung. Bestandsaufnahme, Interventionen und Evaluation im Projekt "Health.edu"* [Health in physical education and physical education teacher education: Stock-taking, interventions and evaluation in the "Health.edu" project]. Springer VS.
- Till, M., Abu-Omar, K., Ferschl, S., Abel, T., & Gelius, P., on behalf of the Capital4Health consortium (under review). Using the capability approach in health promotion projects: A framework for implementation.
- Van Ootegem, L., & Verhofstadt, E. (2012). Using capabilities as an alternative indicator for Well-being. *Social Indicators Research, 106*(1), 133–152.
- Wallerstein, N. B., & Duran, B. (2006). Using community-based participatory research to address health disparities. *Health Promotion Practice, 7*(3), 312–323.
- Weiss, C. H. (1979). The many meanings of research utilization. *Public Administration Review, 39*(5), 426–431. <https://doi.org/10.2307/3109916>

- WHO. (1998). *Health promotion glossary*. World Health Organization. Retrieved from: <https://www.who.int/healthpromotion/about/HPR%20Glossary%201998.pdf?ua=1>
- WHO. (2009). *Interventions on diet and physical activity: What works: Summary report*. World Health Organization. Retrieved from: https://apps.who.int/iris/bitstream/handle/10665/44140/9789241598248_eng.pdf;jsessionid=C539D2462C7161E245BE11E825A9AD4F?sequence=1
- Zwass, V. (2010). Co-creation: Toward a taxonomy and an integrated research perspective. *International Journal of Electronic Commerce*, 15(1), 11–48. <https://doi.org/10.2753/JEC1086-4415150101>