October 2023 Editorial

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Welcome to the Autumn 2023 issue of the European Health Psychologist (EHP) magazine! We've put together a-packed issue for you this month, including articles exploring: de-implementation, new methodologies in health psychology, updates from the EHPS mentoring scheme, and a new Inclusivity & Diversity initiative.

A brief overview of the articles included in this issue can be found below.

Patey discusses why de-implementation is of interest of late and how the application of health psychology theories, tools and methods can advance the science of de-implementation.

Gérain and Antoine provide an overview of using network analysis in health psychology.

Foley and colleagues provide an update on the EHPS Ari Haukkala Mentoring Programme.

Gültzow and colleagues introduce the 'Inclusivity & Diversity Add-On for Preregistration Forms' developed during a preconference workshop at the European Health Psychology Society (EHPS) conference held in 2022 in Bratislava (Slovakia).

I've thoroughly enjoyed reading all of these fascinating articles as we pulled this issue together, and I hope you do too.

This is also my final issue before I handover to the new EHP Editors (Filipa Teixeira and Thomas Gültzow), so I'd like to take this opportunity to extend my thanks to the wonderful team of associate editors that I've worked with over the past five years, as well as all the contributors, peer reviewers, EHPS Executive Committee members, and Marianna Dalkou in the EHP preparation team. I also want to extend my gratitude to the EHP co-Editor Pamela Rackow. Without all of these people it wouldn't have been possible to bring you each issue of EHP and they have been a pleasure to work with.

Thank you for reading and enjoy!

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Applying Health Psychology to Advance the Science of De-Implementation

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Introduction

Healthcare Provider (HCP) behaviours are the actions performed by HCPs when delivering healthcare to patients. These behaviours can include activities related to (1) promoting health and preventing illness, (2) assessing and diagnosing illnesses, (3) providing treatments, (4) providing general management of health conditions (5) carrying out action related to healthcare system management and (6) building therapeutic alliances with patients and carers (Patey et al., 2023). A variety of professions are involved in the delivery of these activities including physicians, nurses, midwives, physiotherapists, and other allied healthcare professionals such as psychologists, pharmacists, and dentists. HCP behaviour have their origins in the academic and practical training HCPs receive and evolve as they develop their professional identities throughout their careers (Francis & Presseau, 2019). However, as new scientific discoveries are made in healthcare, new and innovative diagnostic tools and treatments need to be implemented. For example, when newly developed guidelines or a new annual vaccine is required for the public, these advancements require uptake and implementation (Castillo, Patey, & MacDonald, 2021; Vallis et al., 2021). Conversely, when inefficient and harmful clinical practices need to be removed, defined as low-value care, HCPs to change the way they deliver care to their patients. For example, recommendations exist that preoperative tests, such as chest x-rays and electrocardiographs, should not be routine ordered for patients having low-risk surgical procedures (Kirkham et al., 2015), antibiotics should not be prescribed for individuals with upper respiratory tract infections (Wong et al., 2022), and diagnostic imaging should not be ordered for individuals with acute non-complicated low back pain (Hall et al., 2019).

Implementing evidence-based care is a fundamental challenge facing healthcare. Implementation science is a field of research investigating the best methods and strategies to improve to uptake of evidence-based medicine and change clinical practice, whether delivering high value care through implementation or attemping to remove low-value care through de-implementation. Unfortunately, changing clinical practice is not particularly easy and questions arrise as to whether the approaches to support the initiation of new practice behaviours and stopping of outdated practice behaviours should be at the same. This paper discusses why de-implementation is of interest of late and how the application of health psychology theories, tools and methods can advance the science of de-implementation.

Why is everyone so interested in de-implementation?

The delivery of low-value care that is not required or potentially harmful is a global problem. About 25%–30% of all care has been estimated to be of low-value in countries such as Australia,

Canada, Spain, Brazil and the USA, and this estimate rises to 80% for certain procedures (Brownlee et al., 2017; Squires et al., 2022). The harm associated with low-value care can include both direct and indirect patient harms, unnecessary workload for hard-pressed HCPs, wasted healthcare resource and negative impacts on the climate. The recent COVID-19 pandemic has clearly illustrated that healthcare is a limited resource and continued low-value care greatly reduces the availability of those scarce resources to those patients who need it. Fundamentally, people are not receiving the best possible care. Recent work has started to focus what it means to de-implement.

Over the last decade, some of that work has involved an increasing global recognition of the existence of low-value care and its negative consequences. Organizations like Choosing Wisely promote discussions between physicians and patient about appropriate care (Born, Kool, & Levinson, 2019; Levinson, Born, & Wolfson, 2018; Levinson et al., 2014). There are networks such as Deprescribing.org and the United States Deprescribing Research Network which are organizations interested in reducing unnecessary medication and are concerned about polypharmacy (Farrell, McCarthy, & Thompson, 2015; Steinman & Boyd, 2022). Additionally, organizations like Cochrane Sustainable Healthcare (Johansson et al, 2019) and BMJ's Too Much Medicine (Glasziou et al, 2013; Macdonald & Loder, 2015) promote resource stewardship and appropriateness of healthcare delivery. Whilst awareness and advocacy are critical steps in de-implementing low-value care, it alone will not change clinical practice. We require further investigation into the best strategies for de-implementation.

What is the Value of using a Behaviour Science Approach?

If we consider clinical practice as a set of behaviours – whether using new guidelines, preforming a surgical technique, prescribing medications, or providing support or advice to a patient – then encouraging appropriate practice is about supporting behaviour change. Further, encouraging high value care is about reducing the frequency in which low-value care is preformed whether it is often to not at all for a subgroup of patients, often to not at all for the whole patient population, or from monthly to annually for patients. This framing allows us to use psychology to understand de-implementation because we are just trying to get people to stop doing things they should no longer do. There are thousands of different behaviours performed by different HCPs across many contexts, requiring different implementation approaches. Behavioural sciences can be applied to develop de-implementation strategies to support HCP behaviour change and provide valid, reliable tools to evaluate these strategies (Patey et al., 2023).

If changing clinical practice is about changing behaviour and de-implementation as decreasing behaviour frequency, then do behavioural theories proposed different approaches for decreasing frequency of behaviour (i.e., de-implementation) and increasing frequency of behaviour (i.e., implementation). We know that behavioural theories can help with designing de-implementation interventions (Gillies et al., 2021). To effectively apply theories when designing de-implementation interventions, we need to know which theories are best suited for understanding how to reduce behaviours. Using Critical Interpretative Synthesis, a conceptual review of 66 papers and their theoretical sources reported three key findings (Patey, Hurt, Grimshaw, & Francis, 2018). Firstly, 9 of the 15 behavioural theories

identified do not distinguish between implementation and de-implementation (5 theories were applied to only implementation or de-implementation, not both). Secondly, to decrease the frequency of behaviour using theories that did not distinguish between de-implementation and implementation a strategy of substituting one behaviour with another was applied and the behaviour targeted using theory was the novel substitute behaviour (Patey et al., 2018). Interestingly, there was no theoretical basis provided for using this strategy, nor were methods proposed for selecting appropriate substitute behaviours. The third finding was that Operant Learning Theory makes an explicit distinction between techniques for increasing and decreasing frequency of behaviour. Specifically, a behaviour will occur more frequently (implementation) if it is followed by reinforcement and conversely, behaviour will occur less frequently (de-implementation) if it is followed by punishment. However, it is unclear at this point how best to use Operant Learning Theory strategies for de-implementation because they may not be acceptable in health systems; punishments, such as professional sanctions and disciplinary actions, are often used in severe cases of misconduct.

Whilst the term "de-implementation" is a recent term, commonly used in since 2012 (Eccles et al., 2012; Nieuwlaat et al., 2013), decreasing ineffective or harmful healthcare practices (de-implementation) and strategies to support this have been going on for decades. They are sometimes termed "Quality Improvement initiatives" and "Infectious Disease Control". Researchers have been designing implementation and de-implementation interventions for decades but rarely explicitly distinguished between them. It is unclear what approaches are being used and whether implementation and de-implementation interventions do require different strategies. To investigate what approaches are currently being used and perhaps provide insight into the

theoretical perspective applied when designing the interventions, unpacking the 'active ingredients' of the de-implementation interventions is imperative.

The behaviour change technique (BCT) taxonomy (version 1), a tool grounded in the behavioural sciences, is probably the most comprehensive taxonomy of intervention components which consists of 93 techniques (Michie et al., 2013). Each technique has a definition and an example to aid in designing interventions or coding of pre-existing intervention descriptions. Whilst there are a number of taxonomies that permit the identification of intervention components such as the Expert Recommendations of Implementation Strategies (ERIC) (Powell et al., 2015) or the Effective Practice and Organisation of Care (EPOC) (Effective Practice and Organization of Care, 2015) taxonomies, the BCT taxonomy possess a level of granularity and specificity the other taxonomies do not. This granularity permits for an in-depth investigation of the potentially subtle differences in implementation and de-implementation that may be overlooked with other taxonomies (Patey, Grimshaw, & Francis, 2021). A review of intervention descriptions in 181 articles from three systematic reviews in the Cochrane Library were coded using the BCT taxonomy (v1) and found three BCTs identified more frequently in de-implementation than implementation interventions: Monitoring of behaviour by others without feedback, Restructuring social environment, and Behaviour substitution (Patey, Grimshaw, & Francis, 2021). Whilst there are some significant differences between BCTs reported in implementation and de-implementation interventions suggesting that researchers may have implicit theories about different BCTs required for de-implementation and implementation, these findings do not imply that the BCTs identified as targeting implementation or de-implementation are effective, rather simply that they were more frequently used.

What if we just gave Healthcare providers something else to do?

Both the synthesis of behaviour theories and the review of de-implementation interventions identified *Behaviour substitution* as a potential strategy for de-implementation. *Behaviour substitution* is defined in the BCT taxonomy (v1) as "prompt a substitution of the unwanted behaviour with a wanted or neutral behaviour" (Michie et al., 2013). For example, an alternative to order red blood cells (RBC) transfusion for patients with anemia in hospital is to order intravenous iron transfusions (Ionescu et al., 2020). Similarly, another example of behaviour substitution may be when a HCP provides a viral prescription, which is similar in format to a drug prescription, except it explains the symptoms of an upper respiratory tract infection (e.g., common cold) and provides management strategies instead of prescribing antibiotics for sore throat (Lee et al., 2020). Pragmatically, it is a strategy that is likely more acceptable to HCPs as it maintains clinical autonomy and self-regulation and it is better than the ethical and social consequences of using punitive technique. HCPs are typically action oriented people who may be uncomfortable with the option of appearing to do nothing during patient consultations or in response to patient need. But how do we know when best to us it and how do we pick a substitute behaviour?

To address this, recent work discussed why *Behaviour substitution* may be a useful de-implementation strategy, and why it may not be suitable for all circumstances (Patey, Grimshaw, & Francis, 2023). Based on the body of knowledge in behavioural science, and as well as an established framework to identify barriers and enablers to behaviour change, the Theoretical Domains Framework (Michie et al., 2005), a list of principles was proposed when considering and/or selecting a substitute behaviour for a de-implementation intervention. Specifically, the substitute behaviour should 1) have a clinical rationale or strong evidence base for its use (*Knowledge, Memory attention and decision processes, Beliefs about consequences*); 2) serves the clinical objective (patient outcome) and serves the practical objective (e.g., satisfy the patient that they have been taken seriously; offer symptom relief) (*Beliefs about consequences, Social influences, Memory, attention and decision processes*); 3) be easily explainable to patients (*Beliefs about capabilities, Social Influences, Beliefs about consequences*); 4) be no more time-consuming than the undesired behaviour (*Environmental context and resources, Beliefs about consequences*); 5) have good fit with existing skills (*Skills, Beliefs about capabilities*); 6) be no more expensive to perform than the undesired behaviour (*Environmental Context and resources, Beliefs about consequences*). It is proposed that applying these principles should increase the likelihood that Behaviour substitution will be effective in reducing low-value care (Patey, Grimshaw, & Francis, 2023).

Where do we go from here?

In the last six years theories, tools, and methods from Health Psychology have greatly advanced our understanding of de-implementation. Whilst most behavioural theories provide little insight into the distinction between implementation and de-implementation, Operant Learning Theory may be an option. Our next focus should be on how we best deliver strategies from Operant Learning Theory specifically around selecting the dose, or potency, of punishment stimulus required to have an effect and whether there is a linear relationship between potency of the stimulus and behaviour change. For example, what forms of punishments could be applied in health care systems?; How are punishments conceptualised and how could they be titrated to get the desired effect?; Should the same

or differing levels of punishment be applied in circumstances whereby behaviour needs to be eliminated versus behaviour that only needs to decrease in frequency (e.g. would stopping antibiotic prescriptions for sore throats require the same punishment stimulus as reducing the number of imaging requests for low back pain?); Could making test ordering inconvenient, by requiring additional repeated justifications or approvals, be enough of a punishment to reduce unnecessary test ordering? Additionally, with respect the proposed de-implementation strategy, Behaviour substitution, understanding how we know when best to us it and what are the methods for selecting the substitute behaviour requires investigation. While the work presented is just a start in understanding de-implementation and exploratory in nature, there is more opportunity to advance both de-implementation science and Health Psychology to improve to delivery of high value health care.

References

Born, K., Kool, T., & Levinson, W. (2019). Reducing overuse in healthcare: Advancing Choosing Wisely. *British Medical Journal, 367*.

Brownlee, S., Chalkidou, K., Doust, J. et al. (2017). Evidence for overuse of medical services around the world. *The Lancet, 390*(10090), 156–168.

Castillo, E., Patey, A., & MacDonald, N. (2021). Vaccination in pregnancy: Challenges and evidence-based solutions. *Best Practice & Research Clinical Obstetrics & Gynaecology, 76*, 83–95.

Eccles, M., Foy, R., Sales, A. E. et al. (2012). Implementation Science six years on—Our evolving scope and common reasons for rejection without review. *Implement Sci, 7,* 71.

Farrell, B., McCarthy, L., & Thompson, W. (2015). *Deprescribing.org*. Retrieved from https://

deprescribing.org

Francis, J. J., & Presseau, J. (2019). Health Care Practitioner Behaviour. In C. Llewellyn, S. Ayers, I. C. McManus, S. P. Newman, K. Petrie, T. Revenson, & J. Weinman (Eds.), *Cambridge Handbook of psychology, health and medicine* (pp. 325–329). Cambridge University Press.

Gillies, K., Brehaut, J., Coffey, T. et al. (2021). How can behavioural science help us design better trials? *Trials, 22*, 1–7.

Glasziou, P., Moynihan, R., Richards, T. et al. (2013). *Too much medicine; too little care*. British Medical Journal Publishing Group.

Hall, A. M., Scurrey, S. R., Pike, A. E. et al. (2019). Physician-reported barriers to using evidence-based recommendations for low back pain in clinical practice: A systematic review and synthesis of qualitative studies using the Theoretical Domains Framework. *Implementation Science, 14*(1), 49.

Ionescu, A., Sharma, A., Kundnani, N. R. et al. (2020). Intravenous iron infusion as an alternative to minimize blood transfusion in peri-operative patients. *Scientific Reports, 10*(1), 18403.

Johansson, M., Bero, L., Bonfill, X. et al. (2019). Cochrane Sustainable Healthcare: Evidence for action on too much medicine. *Cochrane Database Syst Rev, 12*, ED000143.

Kirkham, K. R., Wijeysundera, D. N., Pendrith, C. et al. (2015). Preoperative testing before low-risk surgical procedures. *Canadian Medical Association Journal, 187*(11), E349–E358.

Lee, C., Jafari, M., Brownbridge, R. et al. (2020). The viral prescription pad-a mixed methods study to determine the need for and utility of an educational tool for antimicrobial stewardship in primary health care. *BMC Family Practice, 21*(1), 1–12.

Levinson, W., Born, K., & Wolfson, D. (2018). Choosing Wisely Campaigns: A Work in Progress. *Journal of the American Medical Association, 319*(19), 1975–1976.

Levinson, W., Kallewaard, M., Bhatia, R. S. et al.

(2015). 'Choosing Wisely': A growing international campaign. *BMJ Quality and Safety, 24*(2), 167–174. https://doi.org/10.1136/bmjqs-2014-003821

MacDonald, H., & Loder, E. (2015). *Too much medicine: The challenge of finding common ground*. British Medical Journal Publishing Group.

Michie, S., Johnston, M., Abraham, C. et al. (2005). Making psychological theory useful for implementing evidence based practice: A consensus approach. *Quality and Safety in Health Care, 14*(1), 26.

Michie, S., Richardson, M., Johnston, M. et al. (2013). The Behavior Change Technique Taxonomy (v1) of 93 Hierarchically Clustered Techniques: Building an International Consensus for the Reporting of Behavior Change Interventions. *Annals of Behavioral Medicine, 46*(1), 81–95. https://doi.org/10.1007/s12160-013-9486-6

Nieuwlaat, R., Schwalm, J.-D., Khatib, R. et al. (2013). Why are we failing to implement effective therapies in cardiovascular disease? *European Heart Journal, 34*(17), 1262–1269.

Patey, A. M., Fontaine, G., Francis, J. J. et al. (2023). Healthcare professional behaviour: Health impact, prevalence of evidence-based behaviours, correlates and interventions. *Psychology & Health,* 1–29.

Patey, A. M., Grimshaw, J. M., & Francis, J. J. (2021). Changing behaviour, 'more or less': Do implementation and de-implementation interventions include different behaviour change techniques? *Implementation Science, 16*(1), 1–17. https://doi.org/10.1186/s13012-021-01089-0

Patey, A. M., Grimshaw, J. M., & Francis, J. J. (2023). The big six: Key principles for effective use of Behavior substitution in interventions to de-implement low-value care. *JBI Evidence Implementation, 10*.1097. https://doi.org/doi:10.1097/XEB.0000000000000351

Patey, A. M., Hurt, C. S., Grimshaw, J. M. et al.

(2018). Changing behaviour, "more or less": do theories of behaviour inform strategies for implementation and de-implementation? A critical interpretive synthesis. *Implementation Science, 13*. https://doi.org/10.1186/s13012-018-0826-6

Powell, B. J., Waltz, T. J., Chinman, M. J. et al. (2015). A refined compilation of implementation strategies: Results from the Expert Recommendations for Implementing Change (ERIC) project. *Implementation Science, 10*(1), 21.

Squires, J. E., Cho-Young, D., Aloisio, L. D. et al. (2022). Inappropriate use of clinical practices in Canada? A systematic review. *Canadian Medical Association Journal, 194*(Accepted December 16, 2021).

Steinman, M. & Boyd, C. (2022). *US Desprescribing Research Network*. Retrieved from https://deprescribingresearch.org

Vallis, M., Bacon, S., Corace, K. et al. (2021). Ending the pandemic: How behavioural science can help optimize global COVID-19 vaccine uptake. *Vaccines, 10*(1), 7.

Wong, S., Rajapakshe, S., Barber, D. et al. (2022). Antibiotic prescribing for respiratory tract infection across a national primary care network in 2019. *Canada Communicable Disease Report, 48*(4), 157.

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Making Research Look Like the World Looks: Introducing the 'Inclusivity & Diversity Add-On for Preregistration Forms' Developed During an EHPS2022 Pre-Conference Workshop

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Introduction

The title of this paper is based on a quote from Shonda Rhimes – an American TV screenwriter, producer, and author – who is often said to be invested in issues of diversity, but says that she is merely trying to make television look like the world looks (Rhimes, 2015). In similar vein, psychological research – that often relies on Western, educated, industrialised, rich, and democratic (WEIRD) samples – is often criticised for not covering all parts of society. For example, other scholars have pointed out psychology's heteronormative tendencies (Thorne et al., 2019) and that psychological research often fails to account for BIPOC (Black, Indigenous, and other People of Colour) populations (Buchanan et al., 2021). Although it was long assumed that focusing on homogeneous (e.g., WEIRD) populations will still lead to generalisable conclusions, it is increasingly recognised that this generalisability assumption fails to account for the fact that different human populations differ in various domains (Henrich et al., 2010). For example, specific to health psychology, researchers have found that socio-structural attributes are not only associated with the epidemiology of health conditions, but also with behavioural determinants, such as intentions and attitudes, as well as how these relate to one another and their relationship with actual behaviour (Conner et al., 2013; Rich et al., 2014; Schüz, 2017; Schüz et al., 2017, 2020, 2021; Wolfers et al., 2010). Even though such differences based on individual characteristics have already been reported in the literature, the exploration and active inclusion of this in health psychological research remains somewhat limited (Nathan et al., 2016; Szinay et al., 2023). But even beyond this generalisability perspective, the failure to account for different human populations should also be avoided from a social justice perspective (Huminuik et al., 2022; Leong et al., 2017). Health psychology can play a role in achieving an equal distribution of wealth, opportunity, and privilege, but only by involving a diverse group of participants in health psychology research. It is therefore important that researchers in health psychology not only recognise that these differences exist (without perpetuating stereotypes), but also take them into account in their research practice. In other words, in an ideal world, health psychology should be diverse (i.e., should include people with diverse backgrounds and individual characteristics, Servaes et al., 2022) and inclusive (i.e., should strive not to exclude anyone based on such characteristics, "Inclusivity," n.d.).

Other scholars often describe that research practices need to be adjusted to make diverse

populations visible in research (Ekong et al., 2022; Nagelhout et al., 2021), e.g., by incorporating a minimal set of 'diversity items' for routine data collection (Stadler et al., 2022). This requires careful thought and planning about how different groups are involved in a study. Although we hope that most researchers plan their studies carefully, recently more and more researchers and Open Science proponents advocate the use of so-called (pre)registrations, i.e., documents that make it possible to publish study plans before (parts of) the actual study are carried out (Nosek & Lindsay, 2018). In addition to the often-recognised benefits of (pre)registrations (e.g., increased transparency), they may also ensure that research plans are drawn up more clearly and carefully (Logg & Dorison, 2021; Sarafoglou et al., 2022). (Pre)registrations may therefore also be useful to make (health) psychological research both more diverse and more inclusive. However, to our knowledge there was no (pre)registration form available until now that focused on diversity and inclusivity, so we took the opportunity to develop one during a set of pre-conference workshops at the European Health Psychology Society (EHPS) conference held in 2022 in Bratislava (Slovakia).

Preregistration & Preregr for fun, profit, exploration, and adventure

The three authors attended two half-day workshops facilitated by Dr. Chris Noone of the University of Galway and Dr. Gjalt-Jorn Peters of the Open University of the Netherlands. While we provide a brief overview of these workshops, the content can also be found on the Open Science Framework (Noone & Peters, 2022). During these workshops we learned why (pre)registrations have become popular, what the benefits are, but also why some might criticise them. Additionally, we learned how preregistration forms can be constructed and subsequently implemented in

{preregr} (Eijk et al., 2023). {Preregr} (Eijk et al., 2023) is an R package that facilitates both specifying preregistration forms as well as specifying such completed forms (i.e., (pre)registrations) in R (R Development Core Team, 2021) and exporting them to a human and machine readable format. Because of our shared interest in diversity and inclusivity, we decided to construct a (pre)registration form focused on these two aspects.

Introducing the Inclusivity & Diversity Add-on for preregistration forms

While there are general (pre)registration forms (Bowman et al., 2020), other forms are often aimed at a specific type of research, such as qualitative and quantitative ethnographic research (Zörgő, 2023) or secondary data analysis (Akker et al., 2021). However, because we believe that all types of research should, in principle, strive to be diverse and inclusive, we decided not to develop a 'usual' standalone form, but an add-on, i.e., a form that can be added to any other existing form, such as the one for qualitative and quantitative ethnographic research (Zörgő, 2023). To make this more tangible: Suppose you want to carry out a quantitative ethnographic study and aim to involve marginalised groups in this study, but you also want to conduct your research according to Open Science principles. Our add-on allows you to register the general part of your study (e.g., your research aims) in the form for qualitative and quantitative ethnographic research (Zörgő, 2023) and then write down your strategies for conducting your research inclusively in our add-on. Version 0.1 that we developed during the set of workshops allows researchers to pre-define (1) the research team composition (if deemed safe), (2) the hypotheses taking different social groups into

Table 1

Preregistration elements and description

Elements	Description
Research team composition	Explain the composition of the research team in terms of different characteristics (such as geography, sexual orientation, gender, race, ethnicity) and how those relate to the research itself. This information should only be shared if it is safe to do so. If you endanger yourself or others by sharing this information, please do not share this information.
Hypotheses	Explain if and how your data allows for disaggregation between different social groups and make this explicit in all hypotheses.
Data collection method	Explain how you will take into account the diversity of your target group in terms of data collection methods. For example, you could describe the different data collection methods you use to reach as diverse a target audience as possible.
Population	Describe the (target) population of your study and why this specific population was chosen, taking into account inclusivity and diversity.
Sample composition	Explain how you will take the diversity of your target group into account in relation to recruitment, retention, data analysis, and interpretation.
Measured variables	Explain how you decided which personal characteristics are measured in the study and how those are relevant for your study taking inclusivity and diversity into account.
Disaggregation	Explain whether and how (if applicable) your data will be disaggregated for all relevant groups separately (e.g., certain sexual minorities) also keeping intersectionality in mind (e.g., certain sexual minorities of colour) and how potential undersized groups (from a statistical point of view) will be handled in the data analysis phase. If this is not possible, explain why.
Recoded data information	If a dataset associated with the study is publicly shared, and in it variables from multiple groups have been recoded based on personal characteristics (e.g., all sexual minorities who participated rather than each sexual minority group separately), explain if and how (if applicable) you ensure that other researchers can work with the more detailed data while respecting the privacy of the participants. If this is not possible, explain why.

account, (3) how data collection methods take the diversity of the study's target group into account, (4) the study's population, (5) the sample composition, (6) which personal characteristics will be measured, (7) whether and how data will be disaggregated for all relevant groups, (8) and in the case of a publicly shared dataset, how other researchers can work with more detailed data when variables from multiple groups will be recoded based on personal characteristics (e.g., all sexual minorities who participated rather than each sexual minority group separately). More information can be found in Table 1. Using the categorisation of the different development methods to create new preregistration forms described by Eijk et al. (2023), we followed a combination of the rationalist approach and the expert consensus method to develop our add-on. Most of the input was collected in the form of a discussion between the three authors, while direct substantive feedback was given during the workshop itself. After the workshop, the add-on was finalised and Dr. Gjalt-Jorn Peters also provided substantive and technological feedback during this period.

We have striven to make this form as generic as possible while acknowledging that it is not always necessary to include all individual characteristics in

a study plan, e.g., in a study not focusing on sexual identity it may not be necessary to assess sexual identity and we do not want our form to lead to the unnecessary assessment of such characteristics. This may seem inconsistent with our goal of promoting inclusive research, but because we also do not want our add-on to lead to unnecessary and long data collection from the respondents' perspective, we have made the consideration of which attributes to collect explicit in the form itself – this notion is in line with the principle of data minimisation (European Data Protection Supervisor, n.d.). Version 0.1 can be found through the {preregr} package (Eijk et al., 2023; Gültzow et al., 2023a). For illustrative purposes, an 'empty' version of the form can also be found on the Open Science Framework (Gültzow et al., 2023b).

If you wish to use the form, you can install the {preregr} package using:

```
install.packages("preregr");
```

Once installed, you can load the form and export it into an R Markdown template using:

```
preregr::form_to_rmd_template(

  "inclDivAddon_v0_1",

  file = "C:/path/to/a/file.Rmd"
);
```

You can then open file "C:/path/to/a/file.Rmd" and complete the form entries. The result can then be embedded in a Quarto or R Markdown file, exported to a PDF that can be posted at a registration service like the Open Science Framework, or both (for more guidance, you can consult the {preregr} documentation, Peters, 2023). For people with little R experience, we have also made available a Google Sheet document that can be copied and filled in directly (Gültzow et al., 2023c).

Conclusion

The developed 'Inclusivity & Diversity Add-On for Preregistration Forms' allows researchers to review and share their considerations on socio-demographic characteristics in their study along various stages, such as the team's composition, hypotheses, recruitment of participants, possibilities for data disaggregation, and data sharing. Although our new add-on is not a (perfect) solution to the problem that some populations are still underrepresented in research, including in health psychology, we believe it can stimulate more diversity and inclusivity. We also want to acknowledge that this form has been developed in a fairly simple way and therefore invite everyone to give us feedback to improve the form. Finally, we would like to thank the EHPS and especially Dr. Chris Noone and Dr. Gjalt-Jorn Peters for the opportunity to develop this form and for providing feedback on this paper. We wrote this article to raise awareness for this add-on. We therefore want to encourage readers to experiment with its use and would like it to be distributed further (e.g., through the EHPS' Open Science Special Interest Group).

Declaration of possible conflicts of interest: The authors report there are no competing interests to declare.

References

Akker, O. R. van den, Weston, S., Campbell, L., Chopik, B., Damian, R., Davis-Kean, P., Hall, A., Kosie, J., Kruse, E., Olsen, J., Ritchie, S., Valentine, K. D., Veer, A. van 't, & Bakker, M. (2021). Preregistration of secondary data analysis: A template and tutorial. *Meta-Psychology, 5*. https://doi.org/10.15626/MP.2020.2625

Bowman, S., DeHaven, A. C., Errington, T. M., Hardwicke, T. E., Mellor, D. T., Nosek, B. A., & Soderberg, C. K. (2020). *OSF Prereg Template*. MetaArXiv. https://doi.org/10.31222/osf.io/epgjd

Buchanan, N. T., Perez, M., Prinstein, M. J., & Thurston, I. B. (2021). Upending racism in psychological science: Strategies to change how science is conducted, reported, reviewed, and disseminated. *American Psychologist, 76*(7), 1097–1112. https://doi.org/10.1037/amp0000905

Conner, M., McEachan, R., Jackson, C., McMillan, B., Woolridge, M., & Lawton, R. (2013). Moderating Effect of Socioeconomic Status on the Relationship between Health Cognitions and Behaviors. *Annals of Behavioral Medicine, 46*(1), 19–30. https://doi.org/10.1007/s12160-013-9481-y

Eijk, N. van, Jiao, H., & Peters, G.-J. (2023). *Making Preregistration Accessible: An R Package to Make Machine-Readable Preregistrations and Create New Preregistration Forms*. PsyArXiv. https://doi.org/10.31234/osf.io/qfjy7

Ekong, A., Adesina, N., Regmi, P., Tsofliou, F., Wood, J., & Taylor, J. (2022). Barriers and Facilitators to the recruitment of Black African women for research in the UK: Hard to engage and not hard to reach. *Midirs Midwifery Digest, 32*(2), Article 2.

European Data Protection Supervisor. (n.d.). D | *European Data Protection Supervisor*. Retrieved June 30, 2023, from https://edps.europa.eu/data-protection/data-protection/glossary/d_en

Gültzow, T., Neter, E., & Zimmermann, H. (2023a). *Inclusivity & Diversity Add-on for preregistration forms*. https://preregr.opens.science/articles/form_inclDivAddon_v0_1.html

Gültzow, T., Neter, E., & Zimmermann, H. (2023b). *Example*.pdf. https://osf.io/v7tbd

Gültzow, T., Neter, E., & Zimmermann, H. (2023c). *Fillable Inclusivity & Diversity Add-On for Preregistration Forms*.gsheet. https://osf.io/ahkwu

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). Most people are not WEIRD. *Nature, 466*(7302), 29–29. https://doi.org/10.1038/466029a

Huminuik, K., O'Connor, M., Dockett, K., Kallivayalil, D. J., McFarland, S. G., & Wyndham, J. M. (2022). Moving human rights to the forefront of psychology: Summary of the final report of the APA task force on human rights. *American Psychologist, 77*(4), 589–601. https://doi.org/10.1037/amp0000897

Inclusivity. (n.d.). In Collins English Dictionary – Complete and Unabridged (12th ed.). Retrieved March 5, 2023, from https://www.thefreedictionary.com/inclusivity

Leong, F. T. L., Pickren, W. E., & Vasquez, M. J. T. (2017). APA efforts in promoting human rights and social justice. *American Psychologist, 72*, 778–790. https://doi.org/10.1037/amp0000220

Logg, J. M., & Dorison, C. A. (2021). Pre-registration: Weighing costs and benefits for researchers. *Organizational Behavior and Human Decision Processes, 167*, 18–27. https://doi.org/10.1016/j.obhdp.2021.05.006

Nagelhout, G., Abidi, L., van Koeveringe, J., Bosma, H., Poole, N., Alleva, J., Smolka, M., & van Lierop, B. (2021). *Towards inclusive research at Maastricht University: Survey results*. https://ivo.nl/wp-content/uploads/2021/10/Factsheet-DI-survey-inclusive-research-results.pdf

Nathan, A. G., Marshall, I. M., Cooper, J. M., & Huang, E. S. (2016). Use of Decision Aids with Minority Patients: A Systematic Review. *Journal of General Internal Medicine, 31*(6), 663–676. https://doi.org/10.1007/s11606-016-3609-2

Noone, C., & Peters, G.-J. (2022). *Preregistration workshops at EHPS 2022*. https://osf.io/37ts5/

Nosek, B. A., & Lindsay, S. (2018). Preregistration Becoming the Norm in Psychological Science. *APS Observer, 31*. https://www.psychologicalscience.org/observer/preregistration-becoming-the-norm-in-psychological-science

Peters, G.-J. (2023, March 5). *Specify (Pre)Registrations and Export Them Human- And Machine-Readably*. https://preregr.opens.science/

R Development Core Team. (2021). *R: A language and environment for statistical computing*. https://www.R-project.org/

Rhimes, S. (2015, March 16). *"You Are Not Alone."* Medium. https://medium.com/@shondarhimes/you-are-not-alone-69c1a10515ab

Rich, A., Mullan, B. A., Sainsbury, K., & Kuczmierczyk, A. R. (2014). The role of gender and sexual experience in predicting adolescent condom use intentions using the theory of planned behaviour. *The European Journal of Contraception & Reproductive Health Care, 19*(4), 295–306. https://doi.org/10.3109/13625187.2014.917624

Sarafoglou, A., Kovacs, M., Bakos, B., Wagenmakers, E.-J., & Aczel, B. (2022). A survey on how preregistration affects the research workflow: Better science but more work. *Royal Society Open Science, 9*(7), 211997. https://doi.org/10.1098/rsos.211997

Schüz, B. (2017). Socio-economic status and theories of health behaviour: Time to upgrade a control variable. *British Journal of Health Psychology, 22*(1), 1–7. https://doi.org/10.1111/bjhp.12205

Schüz, B., Brick, C., Wilding, S., & Conner, M. (2020). Socioeconomic Status Moderates the Effects of Health Cognitions on Health Behaviors within Participants: Two Multibehavior Studies. *Annals of Behavioral Medicine, 54*(1), 36–48. https://doi.org/10.1093/abm/kaz023

Schüz, B., Conner, M., Wilding, S., Alhawtan, R.,

Prestwich, A., & Norman, P. (2021). Do socio-structural factors moderate the effects of health cognitions on COVID-19 protection behaviours? *Social Science & Medicine, 285*, 114261. https://doi.org/10.1016/j.socscimed.2021.114261

Schüz, B., Li, A. S.-W., Hardinge, A., McEachan, R. R. C., & Conner, M. (2017). Socioeconomic status as a moderator between social cognitions and physical activity: Systematic review and meta-analysis based on the Theory of Planned Behavior. *Psychology of Sport and Exercise, 30*, 186–195. https://doi.org/10.1016/j.psychsport.2017.03.004

Servaes, S., Choudhury, P., & Parikh, A. K. (2022). What is diversity? *Pediatric Radiology, 52*(9), 1708–1710. https://doi.org/10.1007/s00247-022-05356-0

Stadler, G., Chesaniuk, M., Haering, S., Roseman, J., Strassburger, V. M., & Schraudner, M. (2022). *Diversified Innovations in the Health Sciences-Proposal for a Diversity Minimal Item Set*. https://doi.org/10.31234/osf.io/bjyms

Szinay, D., Forbes, C. C., Busse, H., DeSmet, A., Smit, E. S., & König, L. M. (2023). Is the uptake, engagement, and effectiveness of exclusively mobile interventions for the promotion of weight-related behaviors equal for all? A systematic review. *Obesity Reviews, 24*(3), e13542. https://doi.org/10.1111/obr.13542

Thorne, S. R., Hegarty, P., & Hepper, E. G. (2019). Equality in theory: From a heteronormative to an inclusive psychology of romantic love. *Theory & Psychology, 29*(2), 240–257. https://doi.org/10.1177/0959354319826725

Wolfers, M. E., Kok, G., Mackenbach, J. P., & de Zwart, O. (2010). Correlates of STI testing among vocational school students in the Netherlands. *BMC Public Health, 10*(1), 725. https://doi.org/10.1186/1471-2458-10-725

Zörgő, S. (2023). *Preregistration Template for Qualitative and Quantitative Ethnographic Studies*. https://docs.google.com/document/d/1LsTptfqGQ7rEUGxEB4dM572xcjkXWqxg6O-YY-mzh08/

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Perspectives on using psychological network analysis in health psychology

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Research in psychology is about addressing complexity by exploring complex processes in individuals that evolve in complex systems (Fried & Robinaugh, 2020). Health psychology makes no exception as it covers a wide scope from preventing sickness to helping deal with illnesses (Baum et al., 2012). It considers the interactions between people's thoughts, feelings, behaviours, and biological processes in given social environments. Our understanding of the mesh they form is increasing and new methods are used to appraise them. One tool that can be used to account for that complexity is the network analysis (Hevey, 2018; Mkhitaryan et al., 2019).

Network analysis has been applied to psychological constructs to examine the relationships between different variables (e.g., behaviors, cognitions, items) (Hevey, 2018). This method is often referred to as the psychological network analysis (Burger et al., 2022) or psychometric network (Jones et al., 2021). It takes its source in a growing field of psychopathological research that questions how mental health conditions are conceived through the network theory of mental disorders (see Borsboom, 2017).

Psychological network analysis is an exploratory method to investigate patterns of statistical associations in multivariate psychological data (Borsboom et al., 2021). *Nodes* are variables (e.g., an item score) and *edges* are statistical associations between nodes. Most of the time, these statistical associations are partial correlation coefficients for continuous data and logistical regression coefficients for binary data. Both methods aim at identifying the presence and magnitude of *edges* between *nodes* while considering the role of all the other nodes in the network.

Several centrality indicators can be computed. Among these, *node strength* is one of the most important, as it shows the sum of its edges to other *nodes* (Bringmann et al., 2019). It shows how variables are importantly associated with the others included in the network, reflecting their important role within the network. By doing so, it suggests which variables could be key processes or even targets of interventions (for a nuanced discussion on the topic, see Bringmann et al., 2019). Beyond a focus on nodes, network analysis also allows the exploration of communities (i.e., a grouping of variables that share common features). Communities can be theory-based (independent from the network structure, e.g., a set of specific symptoms, Jones et al., 2021) or defined through statistical methods (dependent on the network structure, e.g., a set of variables that are densely inter-correlated and interact in a comparable way with other communities, Traag & Bruggeman, 2009). The investigation of communities allows for an exploration of how different groups of variables interact (e.g., a group of behaviours). One of the ways to do so is to explore which variables are *bridges* between, namely, variables that are essential to capture how two communities are associated (Jones et al., 2021).

An important element to consider is that network analysis can be used to understand the relationship between variables in two ways: single measurement (cross-sectional) and multiple, intensive measurements (intensive longitudinal

methods such as ecological momentary assessment) (Borsboom & Cramer, 2013). They can therefore be used in the context of stable constructs to explore how they interact and their relative importance, but also to explore temporal dynamics between variables in short timeframes.

The benefit of such method in comparison to their multivariate counterparts (e.g., structural equation modeling) is to introduce more dynamic in the models through exploratory means by having little to no *a priori* conceptual assumption (Gérain et al., 2022). Therefore, it allows to explore how the investigated variables are associated together while not constraining them in a predefined model. This is particularly useful to provide first and unexpected insights into potential mediation paths, potentially leading to new considerations. Finally, network analysis provides an opportunity to explore potential causality paths between variables through Bayesian Networks representing conditional independence relationships (for more details, see Briganti et al., 2022).

Network analysis is a powerful tool for understanding and exploring this complexity as it provides an analytical method to represent the relationships among different elements (e.g., individuals, behaviours, thoughts). It allows researchers to gain insight into how these components are interconnected and can influence each other. As such, it is a valuable approach in helping us gain better insight into the complexities of human behavior within the context of health psychology research. In this context, psychological network analysis can be applied to different domains. The present work does not aim to be exhaustive but rather provides insights into how the health psychology field could benefit from using them. We propose three main approaches that would be useful: the interplay between constructs, comparing groups or at different moments, and ecological momentary assessment.

1) The interplay between psychological constructs

In the same way as what is performed in psychopathological research, network analysis can be used to explore how psychological constructs are associated. It can be done in two complementary ways. The first is to consider how traits or behaviours vary together to understand how two or more entities are related, in a comparable fashion as exploring the comorbidity or co-occurrence between mental health issues (Kaiser et al., 2021). This can be done for behaviours, as done in a study exploring the attitudes toward using different modes of transport (Kroesen & Chorus, 2020). The results highlighted how certain attitudes were more influential than expected (e.g., *cycling as fun* is more influential than *cycling as healthy*), which can help drive interventions on behaviour change. This has also been done to explore beliefs associated with being an organ donor (Mkhitaryan et al., 2019). The results showed that the strongest node was "*believing that being a donor helps other people*", which reflects its important association with other beliefs and how they are interdependent.

The second approach to the interplay between constructs is to try to better understand risk and protective factors as well as processes involved in leading to a certain outcome, e.g., behaviours or well-being (Contreras et al., 2019). It can highlight what are the variables associated with an outcome while considering their respective interconnectivity. By doing so, it gives insights into the complex role of what is seen as e.g., a "risk factor", notably through its tentacular influence, the presence of circular causality, and what maintains certain processes (as suggested in Gérain et al., 2022). It proposes to nuance the approach of listing risk and protective factors by considering that one factor can have a more complex role (e.g., increasing a risk directly but

decreasing it through another path) while being themselves influenced by other factors. This approach allows the identification of influential nodes that are involved (Bringmann et al., 2019) and paves the way to a process-based approach, by targeting specific influential processes (Hayes et al., 2020). This has for example been explored to investigate determinants of COVID-related behaviors during the pandemic (Chambon et al., 2022). The results highlighted that when taking all elements into account, only a fraction of determinants was directly related to performing the behaviours (e.g., believing in their efficacy) and that performing certain behaviours was only associated with doing other behaviours (e.g., repressive behaviours such as stay at home if ill were only associated with preventive behaviours such as washing hands). A study on informal caregivers' well-being has also highlighted the importance of dyadic interactions in the couple, which is the strongest node in the network (Gérain et al., 2022). This importance shows that what is merely seen as a predictor of well-being is rather the center of the associations in the network.

2) Compare networks between populations or in a pre-post design

Network analysis can be used to compare the network structure in different settings. These settings can be the comparison between populations or in pre-post designs. By comparing populations, they can help us understand how they differ, and therefore how we should address them differently. A study has for example compared the influence of different beliefs about smoking in samples of smokers with and without a recent attempt to quit smoking, showing how some beliefs are more influential than others in the two groups

(Volz & Rothman, 2022). Such insights nuance the support that can be provided to them by showing that targeting certain beliefs would have a different impact on the two populations. Such comparison was also done by comparing psychological well-being of adolescents being either overweight or underweight, notably in showing the distinct role of social challenges in the two groups (Zeiler et al., 2021).

This comparison between groups can also be longitudinal, to explore if the network structure evolves over time (Bringmann & Eronen, 2018). This has been done by exploring how substance use and personality are associated during several stages of adolescence (Afzali et al., 2020). The results showed that one facet of personality that was important at one point may be less relevant later, and that our targets may have to evolve. This has also been done during the COVID crisis by exploring how networks' structures evolved during different phases of the crisis (Di Blasi et al., 2021). The natural evolution of that is to compare psychological networks as pre/post-test in interventions, by exploring if networks differ pre-post intervention.

3) In Ecological Momentary Assessment (EMA) research

A third application of network analyses is to analyze ecological momentary assessment (EMA) data (Borsboom & Cramer, 2013). EMA consists of repeatedly collecting data in an individual's normal environment (outside of the lab), typically in a short timeframe (e.g., several measurements per day for two weeks). We can distinguish two complementary kinds of analyses (Epskamp et al., 2018): a) the temporal network: the exploration of how variables influence each other at the next measurement (temporal relationship); b) the

contemporaneous network: the relationship occurring within the same measurement (co-occurrence).

Contemporaneous networks inform on the co-occurrence and typology of the network, as presented for the interplay between variables. Because EMA focuses on states rather than traits, contemporaneous networks provide information about the co-occurrence and close proximity of states, feelings, and behaviours (e.g., how disease related-symptoms co-occur with worries and anxiety, Oreel et al., 2019). Temporal networks give the opportunity to explore the dynamic associations between variables across time points (Bringmann et al., 2013). In these analyses, the "lag-1" association is explored, which is particularly important regarding the dynamic nature of behaviours and psychological processes. This has been done in an EMA study examining how (un)healthy behaviours can predict behaviors in the following measurement (Dohle & Hofmann, 2019). The results indicated that certain behaviours reinforce themselves (e.g., physical activity predicts physical activity) but also highlighted the spillover of one behaviour onto others (e.g., unhealthy drinking is followed by sleep, relaxation, healthy eating, and physical activity).

Conclusion

This paper described only a fraction of what network analysis can offer to the field of health psychology. Network analysis can better inform us about the interplay between variables, compare groups or moments, and generate a deeper understanding of the relationships and interactions from EMA studies. Other approaches could not be addressed here and include providing insights into causality, use in psychometric scale validation, relevance in N = 1 research, or even the use of

network analysis in meta-analyses. Several challenges are also posed by network analysis, such as how they complement regular multivariate analysis, sample size and statistical requirements, and the development and reliability of indices used (Contreras et al., 2019; McNally, 2021). Although far from being the panacea, network analysis is a useful tool that can produce fruitful, novel insights from our research. Its booming development is promising and holds potential for new uses and findings that will contribute to a better understanding of human functioning related to health.

References

Afzali, M. H., Stewart, S. H., Séguin, J. R., & Conrod, P. (2020). The Network Constellation of Personality and Substance Use: Evolution from Early to Late Adolescence. *European Journal of Personality, 34*(6), 1109–1119. https://doi.org/10.1002/per.2245

Baum, A., Revenson, T. A., & Singer, J. (2012). *Handbook of health psychology.* Psychology press.

Borsboom, D. (2017). A network theory of mental disorders. *World Psychiatry, 16*(1), 5–13. https://doi.org/10.1002/wps.20375

Borsboom, D., & Cramer, A. O. J. (2013). Network Analysis: An Integrative Approach to the Structure of Psychopathology. *Annual Review of Clinical Psychology, 9*(1), 91–121. https://doi.org/10.1146/annurev-clinpsy-050212-185608

Borsboom, D., Deserno, M. K., Rhemtulla, M., Epskamp, S., Fried, E. I., McNally, R. J., Robinaugh, D. J., Perugini, M., Dalege, J., Costantini, G., Isvoranu, A.-M., Wysocki, A. C., van Borkulo, C. D., van Bork, R., & Waldorp, L. J. (2021). Network analysis of multivariate data in psychological science. *Nature Reviews Methods Primers, 1*(1), Article 1. https://doi.org/10.1038/

s43586-021-00055-w

Briganti, G., Scutari, M., & McNally, R. J. (2022). A tutorial on bayesian networks for psychopathology researchers. *Psychological Methods*.

Bringmann, L. F., Elmer, T., Epskamp, S., Krause, R. W., Schoch, D., Wichers, M., Wigman, J. T. W., & Snippe, E. (2019). What do centrality measures measure in psychological networks? *Journal of Abnormal Psychology, 128*(8), 892–903. https://doi.org/10.1037/abn0000446

Bringmann, L. F., & Eronen, M. I. (2018). Don't blame the model: Reconsidering the network approach to psychopathology. *Psychological Review, 125*(4), 606.

Bringmann, L. F., Vissers, N., Wichers, M., Geschwind, N., Kuppens, P., Peeters, F., Borsboom, D., & Tuerlinckx, F. (2013). A Network Approach to Psychopathology: New Insights into Clinical Longitudinal Data. *PLOS ONE, 8*(4), e60188. https://doi.org/10.1371/journal.pone.0060188

Burger, J., Isvoranu, A.-M., Lunansky, G., Haslbeck, J. M. B., Epskamp, S., Hoekstra, R. H. A., Fried, E. I., Borsboom, D., & Blanken, T. F. (2022). Reporting standards for psychological network analyses in cross-sectional data. *Psychological Methods*. https://doi.org/10.1037/met0000471

Chambon, M., Dalege, J., Elberse, J. E., & van Harreveld, F. (2022). A psychological network approach to attitudes and preventive behaviors during pandemics: A COVID-19 study in the United Kingdom and the Netherlands. *Social Psychological and Personality Science, 13*(1), 233–245.

Contreras, A., Nieto, I., Valiente, C., Espinosa, R., & Vazquez, C. (2019). The Study of Psychopathology from the Network Analysis Perspective: A Systematic Review. *Psychotherapy and Psychosomatics, 88*(2), 71–83. https://doi.org/10.1159/000497425

Di Blasi, M., Gullo, S., Mancinelli, E., Freda, M. F., Esposito, G., Gelo, O. C. G., Lagetto, G., Giordano, C., Mazzeschi, C., Pazzagli, C., Salcuni, S., & Lo Coco, G. (2021). Psychological distress associated with the COVID-19 lockdown: A two-wave network analysis. *Journal of Affective Disorders, 284*, 18–26. https://doi.org/10.1016/j.jad.2021.02.016

Dohle, S., & Hofmann, W. (2019). Consistency and Balancing in Everyday Health Behaviour: An Ecological Momentary Assessment Approach. *Applied Psychology: Health and Well-Being, 11*(1), 148–169. https://doi.org/10.1111/aphw.12148

Epskamp, S., Waldorp, L. J., Mõttus, R., & Borsboom, D. (2018). The Gaussian Graphical Model in Cross-Sectional and Time-Series Data. *Multivariate Behavioral Research, 53*(4), 453–480. https://doi.org/10.1080/00273171.2018.1454823

Fried, E. I., & Robinaugh, D. J. (2020). Systems all the way down: Embracing complexity in mental health research. *BMC Medicine, 18*(1), 205. https://doi.org/10.1186/s12916-020-01668-w

Gérain, P., Wawrziczny, E., & Antoine, P. (2022). The use of psychological network analysis in informal dementia care: An empirical illustration. *Aging & Mental Health, 0*(0), 1–10. https://doi.org/10.1080/13607863.2022.2134294

Hayes, S. C., Hofmann, S. G., & Ciarrochi, J. (2020). A process-based approach to psychological diagnosis and treatment:The conceptual and treatment utility of an extended evolutionary meta model. *Clinical Psychology Review, 82*, 101908. https://doi.org/10.1016/j.cpr.2020.101908

Hevey, D. (2018). Network analysis: A brief overview and tutorial. *Health Psychology and Behavioral Medicine, 6*(1), 301–328. https://doi.org/10.1080/21642850.2018.1521283

Jones, P. J., Ma, R., & McNally, R. J. (2021). Bridge Centrality: A Network Approach to Understanding Comorbidity. *Multivariate Behavioral Research, 56*(2), 353–367. https://doi.org/10.1080/00273171.2019.1614898

Kaiser, T., Herzog, P., Voderholzer, U., &

Brakemeier, E.-L. (2021). Unraveling the comorbidity of depression and anxiety in a large inpatient sample: Network analysis to examine bridge symptoms. *Depression and Anxiety, 38*(3), 307–317. https://doi.org/10.1002/da.23136

Kroesen, M., & Chorus, C. (2020). A new perspective on the role of attitudes in explaining travel behavior: A psychological network model. *Transportation Research Part A: Policy and Practice,* 133, 82–94. https://doi.org/10.1016/j.tra.2020.01.014

McNally, R. J. (2021). Network analysis of psychopathology: Controversies and challenges. *Annual Review of Clinical Psychology, 17*, 31–53.

Mkhitaryan, S., Crutzen, R., Steenaart, E., & de Vries, N. K. (2019). Network approach in health behavior research: How can we explore new questions? *Health Psychology and Behavioral Medicine, 7*(1), 362–384. https://doi.org/10.1080/21642850.2019.1682587

Oreel, T. H., Borsboom, D., Epskamp, S., Hartog, I. D., Netjes, J. E., Nieuwkerk, P. T., Henriques, J. P. S., Scherer-Rath, M., van Laarhoven, H. W. M., & Sprangers, M. A. G. (2019). The dynamics in health-related quality of life of patients with stable coronary artery disease were revealed: A network analysias. *Journal of Clinical Epidemiology, 107*, 116–123. https://doi.org/10.1016/j.jclinepi.2018.11.022

Traag, V., & Bruggeman, J. (2009). Community detection in networks with positive and negative links. *Physical Review. E, Statistical, Nonlinear, and Soft Matter Physics,* 80, 036115. https://doi.org/10.1103/PhysRevE.80.036115

Volz, S. C., & Rothman, A. J. (2022). Psychological network analysis of the relations between beliefs about smoking for smokers with and without a recent quit attempt. *Psychology & Health*, 1–18.

Zeiler, M., Philipp, J., Truttmann, S., Waldherr, K., Wagner, G., & Karwautz, A. (2021). Psychopathological Symptoms and Well-Being in Overweight and Underweight Adolescents: A Network Analysis. *Nutrients, 13*(11), 4096.

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An Update on the EHPS Ari Haukkala Mentoring Programme

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Mentoring is increasingly recognised as an essential element of professional and personal development in many contexts where health psychologists work. Broadly speaking, it refers to a socially supportive process with a professional colleague that facilitates such development. Many academics and practitioners have limited access to high quality mentoring relationships because of the inconsistent, informal, and often ad-hoc nature of mentorship. The Ari Haukkala Mentoring Programme is an initiative of the EHPS which aims to support the professional and personal development of members by formally establishing professional connections across career stages. Such an international mentoring programme within the EHPS was first proposed by Wendy Hardeman, Jan Keller, Anne van Dongen, and Milou Fredrix in 2021, and was supported by the EHPS Executive Committee.

A "Task & Finish" group was formed to develop the mentoring programme and to evaluate a pilot version. This pilot programme was launched in December 2022, when EHPS members were invited to sign-up as a mentor or mentee, or both. The programme is underpinned by a developmental style of mentoring, in which the mentor supports the mentee to find solutions to challenges they are encountering, as opposed to providing solutions or opportunities directly. The style encourages mutual learning and understanding, rather than upholding a hierarchical system (Iversen, Eady & Wessely, 2014). To ensure mentors and mentees feel confident in this approach to mentoring, a virtual training session was offered. This provided guidance on the developmental mentoring style and opportunities to practice communicating within this approach.

How were mentors and mentees matched?

Those signing up as a mentor were asked to highlight their reason(s) for doing so and the specific areas in which they could provide mentoring. Those signing up as a mentee were asked to outline what they hoped to attain from the programme, their motivation for taking part, and the skills, qualities and experience they sought in a mentor. This information, together with a biography from each individual, was carefully considered by members of the Task & Finish

Matching Sub-group when matching mentees with a mentor. The thorough matching process took account of several factors to maximise the suitability of the pairings, striving to link the knowledge and expertise of the mentor with the specific needs of the mentee. With an initial goal of establishing ten mentor-mentee pairs, the recruitment and matching phases were considered a success by the Task & Finish group, with sixteen pairs currently taking part in the pilot programme.

How is the pilot programme being evaluated?

To ensure any future iterations of the mentoring programme are directly informed by EHPS members, the pilot includes an integral evaluation element. Participation involves a series of surveys during the first year of mentoring and a focus group discussion at the end of the first year. A full report will be generated at the conclusion of data collection. Ethical approval for the evaluation study was received from the University of Sheffield Research Ethics Committee (Ref: 047473).

What have we learned from the evaluation so far?

Preliminary insights from the data collected to date are included in the remaining sections of this update. Of the 14 mentors and 16 mentees in the pilot, a total of 13 people agreed to take part in the evaluation study and completed one or both of the surveys shared to date. Participants live in Ireland, Germany, the UK and the Netherlands and include professors, lecturers, and research staff (note, this detail represents those who completed the first survey in the evaluation, which is a subset of those taking part in the mentoring programme). The majority of participants responded positively

to the survey items about the developmental mentoring training session, with responses summarised in Figure 1 below. Qualitative feedback from participants highlighted that the interactive nature of the training was appreciated, and that the session helped to clarify roles. Suggestions for improvements in the future included hosting separate tailored training events for mentors and mentees, increasing the numbers attending for greater diversity of experience, and offering further applied guidance on putting the learning into practice during mentoring sessions.

Following one month of mentoring, nine participants reported their experiences to date. All had completed their first mentoring meeting, with plans for future meetings ranging from monthly to quarterly. Responses to questions about the mentoring experience were overwhelmingly positive, summarised in Figure 2. Additional feedback from mentors suggested that mentoring provided an opportunity to give back, reflect, network, listen, and provide objective support, while feedback from mentees indicated that mentoring offered new perspectives, accountability, new research capacities, and a feeling of being supported.

What are the next steps for the evaluation and for the mentoring programme?

As mentioned earlier, the mentors and mentees who consented to take part in the evaluation will be invited to participate in a focus group discussion after one year of mentoring. The discussion will ask participants to reflect on the mentoring programme, including their motivation for signing up, their ideas about the programme, their experiences engaging with the programme throughout the first year, and their perspectives on the future implementation of the programme.

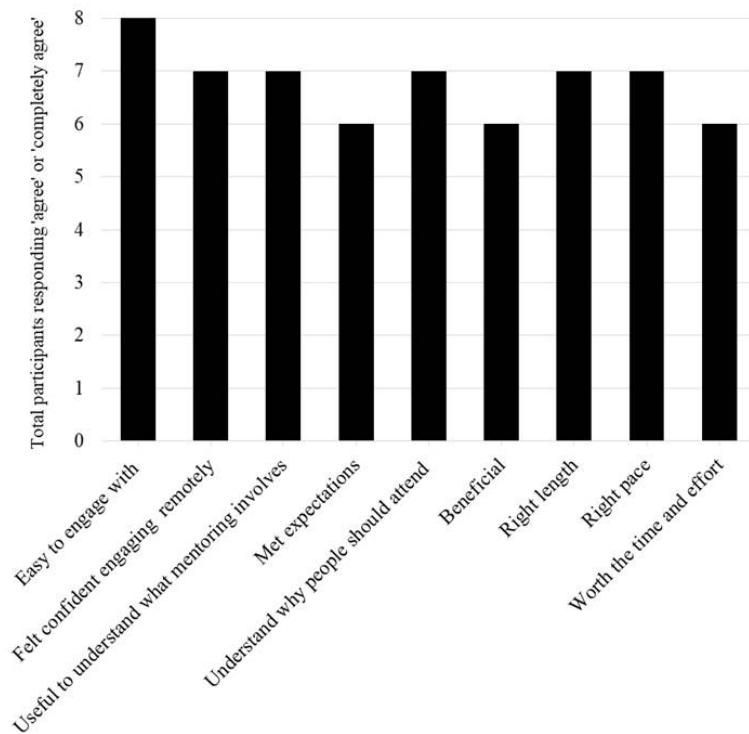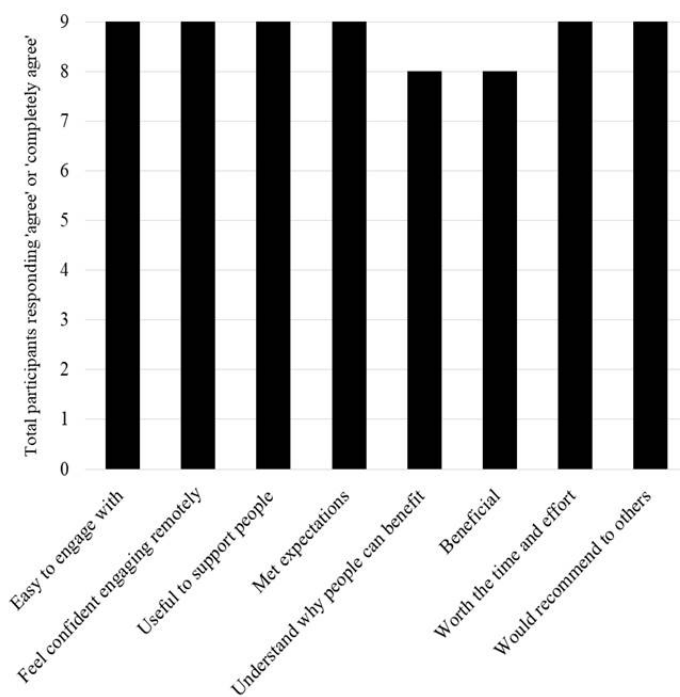**Figure 1**
Summary of responses to post-training survey (n=8)

Figure 2
Summary of responses to one-month survey (n=9)

How can you get involved?

All participants agreed that they would recommend the mentoring programme to others. Given this, discussions are ongoing about how to turn the pilot Ari Haukkala mentoring scheme into an integral part of EHPS routine practice. It is likely that it will become a sub-committee of the EHPS, with rolling recruitment. Evidence from the pilot will inform the continuous development and refinement of the EHPS Ari Haukkala Mentoring Programme, in order to deliver an initiative that is of most value to the EHPS community. Updates will be shared on usual EHPS communication channels when recruitment opens.

To stay up-to-date on the EHPS Ari Haukkala Mentoring Programme, you can visit the website https://ehps.net/mentoring/ and keep an eye on the EHPS newsletter and twitter channel @EHPSociety.

References

Iversen, A. C., Eady, N. A., & Wessely, S. C. (2014). The role of mentoring in academic career progression: a cross-sectional survey of the Academy of Medical Sciences mentoring scheme. *Journal of the Royal Society of Medicine, 107*(8), 308-317. 10.1177/0141076814530685

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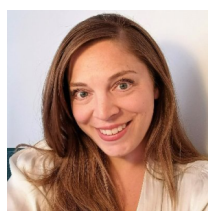University of Limerick, Ireland
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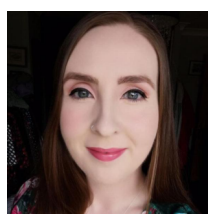
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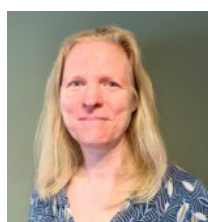University of Stirling, UK
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