

University of Groningen

Towards a more complex, dynamic, and personalized perspective on development

Van Yperen, Nico W.; den Hartigh, Ruud

Published in:
 Motivation Science

DOI:
[10.1037/mot0000280](https://doi.org/10.1037/mot0000280)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
 Final author's version (accepted by publisher, after peer review)

Publication date:
 2023

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Van Yperen, N. W., & den Hartigh, R. (2023). Towards a more complex, dynamic, and personalized perspective on development. *Motivation Science*, 9(1), 17-18. <https://doi.org/10.1037/mot0000280>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Towards a more Complex, Dynamic, and Personalized Perspective on Development

Nico W. Van Yperen & Ruud. J. R. Den Hartigh

Department of Psychology

University of Groningen

The Netherlands

Email: n.van.yperen@rug.nl and j.r.den.hartigh@rug.nl

Wigfield and Eccles' (2022) impressive and influential work focusses on understanding human development and performance attainment. In this commentary, we would like to focus on their articulated hope that "... *more complex system-type perspectives will emerge over the next several years*" (p.31). Indeed, theoretical and practical progress in motivation science can be made by relying on complex and dynamic explanations for developmental processes and goal attainment at the individual level (e.g., Den Hartigh et al., 2022; Gernigon et al., 2015; Van Yperen, 2021).

While Wigfield and Eccles' (2022) findings provide important insights into group differences (e.g., between girls and boys) in achievement-related performance, group-level findings are often limited in understanding individual processes. This *ergodicity problem* has been demonstrated across a range of psychological phenomena (e.g., Fisher et al., 2018; Molenaar, 2004; Neumann et al., 2022). An example from our own achievement domain, sport psychology, is that group level statistics based on inter-individual variation of motivation and confidence collected from athletes several weeks, could not "generalize" to the statistics of the individual athletes, based on their intra-individual variation (Hill et al., 2021).

Furthermore, when proceeding from a complex systems-type perspective, the proposed focus on largely unidirectional causality of Wigfield and Eccles' (2022) predictions is questionable. More likely, goals, expectations, task values, and performances develop out of structures of dynamically interacting (personal and environmental) components, in the form of direct, indirect, reciprocal, and sometimes hierarchical loops of reinforcement or impairment (e.g., Den Hartigh et al., 2016; Gernigon et al., 2015; Hill et al., 2018; Van Yperen, 2022; Van Yperen & Renkema, 2008). Such processes of *circular causality* (Kelso, 1995) capture the ongoing interplay among key components that give rise to the (motivational) state of the individual.

Important to note is that working from a complex, dynamic, and personalized perspective on development, researchers need to overcome several challenges (Den Hartigh et al., 2022). For instance, core (higher order) factors must be identified that shape the developmental process researchers are interested in. To assess these key constructs, a measurement infrastructure needs to be established to obtain individual-level data at high frequency. In our own research on resilience, for example, we focus on factors such as motivation, self-efficacy, affect, performance, and their interactions. We collect these data on a daily basis across the sports season, and examine how these key variables change when transitions in the state of athletes arise (e.g., psychological or physical problems; Den Hartigh et al., 2022; cf. Fonseca et al., 2020). In order to deal with the high volumes of multimodal temporal measures, the rapid developing field of data science offers robust methods to integrate and analyze the data (e.g., De Leeuw et al., 2021). In addition, there is a toolbox of (nonlinear) time series analyses to study the intra-individual patterns of

participants under study. In our view, such a challenging, dynamic and personalized perspective is a possible answer on Wigfield and Eccles' (2022) call for more complex system-type perspectives to better understand complex individual processes in achievement-related performance.

References

- De Leeuw, A. W., Van der Zwaard, S., Van Baar, R., & Knobbe, A. (2021). Personalized machine learning approach to injury monitoring in elite volleyball players. *European Journal of Sport Science*, 22(4), 1–10. <https://doi.org/10.1080/17461391.2021.1887369>
- Den Hartigh, R. J. R., Van Geert, P. L., Van Yperen, N. W., Cox, R. F., & Gernigon, C. (2016). Psychological momentum during and across sports matches: Evidence for interconnected time scales. *Journal of Sport and Exercise Psychology*, 38(1), 82-92. <https://doi.org/10.1123/jsep.2015-0162>
- Den Hartigh, R. J. R., Meerhoff, L. A., Van Yperen, N. W., Neumann, N. D., Brauers, J. J., Frencken, W., Emerencia, A., Hill, Y., Platvoet, S., Atzmueller, M., Lemmink, K. A. P. M., & Brink, M. S. (2022). Resilience in sports: A multidisciplinary, dynamic, and personalized perspective. *International Review of Sport and Exercise Psychology*, xx, xxx-xxx. <https://doi.org/10.1080/1750984X.2022.2039749>
- Fisher, A. J., Medaglia, J. D., & Jeronimus, B. F. (2018). Lack of group-to-individual generalizability is a threat to human subjects research. *Proceedings of the National Academy of Sciences*, 115(27), E6106–E6115. <https://doi.org/10.1073/pnas.1711978115>
- Fonseca, S. T., Souza, T. R., Verhagen, E., Van Emmerik, R., Bittencourt, N. F. N., Mendonça, L. D. M., Andrade, A. G. P., Resende, R. A., & Ocarino, J. M. (2020). Sports injury forecasting and complexity: A synergetic approach. *Sports Medicine*, 50(10), 1757–1770. <https://doi.org/10.1007/s40279-020-01326-4>
- Gernigon, C., Vallacher, R. R., Nowak, A., & Conroy, D. E. (2015). Rethinking approach and avoidance in achievement contexts: The perspective of dynamical systems. *Review of general psychology*, 19(4), 443-457. <https://doi.org/10.1037/gpr0000055>
- Hill, Y., Den Hartigh, R. J. R., Meijer, R. R., De Jonge, P., & Van Yperen, N. W. (2018). Resilience in sports from a dynamical perspective. *Sport, Exercise, and Performance Psychology*, 7, 331–341. <https://doi.org/10.1037/spy0000118>
- Hill, Y., Meijer, R.R., Van Yperen, N.W., Michelakis, G., Barisch, S., & Den Hartigh, R.J.R. (2021). Nonergodicity in protective factors of resilience in athletes. *Sport, Exercise, and Performance Psychology*, 10(2), 217–223. <https://doi.org/10.1037/spy0000246>
- Kelso, J. A. S. (1995). *Dynamic patterns: The self-organization of brain and behavior*. MIT Press.
- Molenaar, P. C. (2004). A manifesto on psychology as idiographic science: Bringing the person back into scientific psychology, this time forever. *Measurement*, 2(4), 201-218. https://doi.org/10.1207/s15366359mea0204_1
- Neumann, N. D., Van Yperen, N. W., Brauers, J. J., Frencken, W., Brink, M. S., Lemmink, K. A. P. M., Meerhoff, L. A., & Den Hartigh, R. J. R. (2022). Nonergodicity in Load and Recovery: Group Results Do Not Generalize to Individuals. *International Journal of Sports Physiology and Performance*, xx, xxx-xxx. <https://doi.org/10.1123/ijspp.2021-0126>

- Van Yperen, N.W. (2021). Achievement goals and self-regulation in the sport context. In: Van Lange, P. A. M., Higgins, E. T., & Kruglanski, A. W. (Eds). *Social Psychology: Handbook of Basic Principles, third edition* (pp. 589-606). Guilford Press.
- Van Yperen, N. W. (2022). In the context of a sports match, the goal to win is most important, right? Suggestive evidence for a hierarchical achievement goal system. *Psychology of Sport & Exercise, 60*, xxx-xxx.
<https://doi.org/10.1016/j.psychsport.2022.102134>
- Van Yperen, N.W. & Renkema, L.J. (2008). Performing great and the purpose of performing better than others: On the recursiveness of the achievement goal adoption process. *European Journal of Social Psychology, 38*, 260-271. <https://doi.org/10.1002/ejsp.425>
- Wigfield, A. & Eccles, J. S. (2022). Expectancy-Value Theory to Situated Expectancy-Value Theory: Reflections on the Legacy of 40+ years of working together. *Motivation Science, XX*, xxx-xxx.