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Fundamental User Needs (FUN) Scales User Guide

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Fundamental User Needs (FUN) Scales

User Guide

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2025

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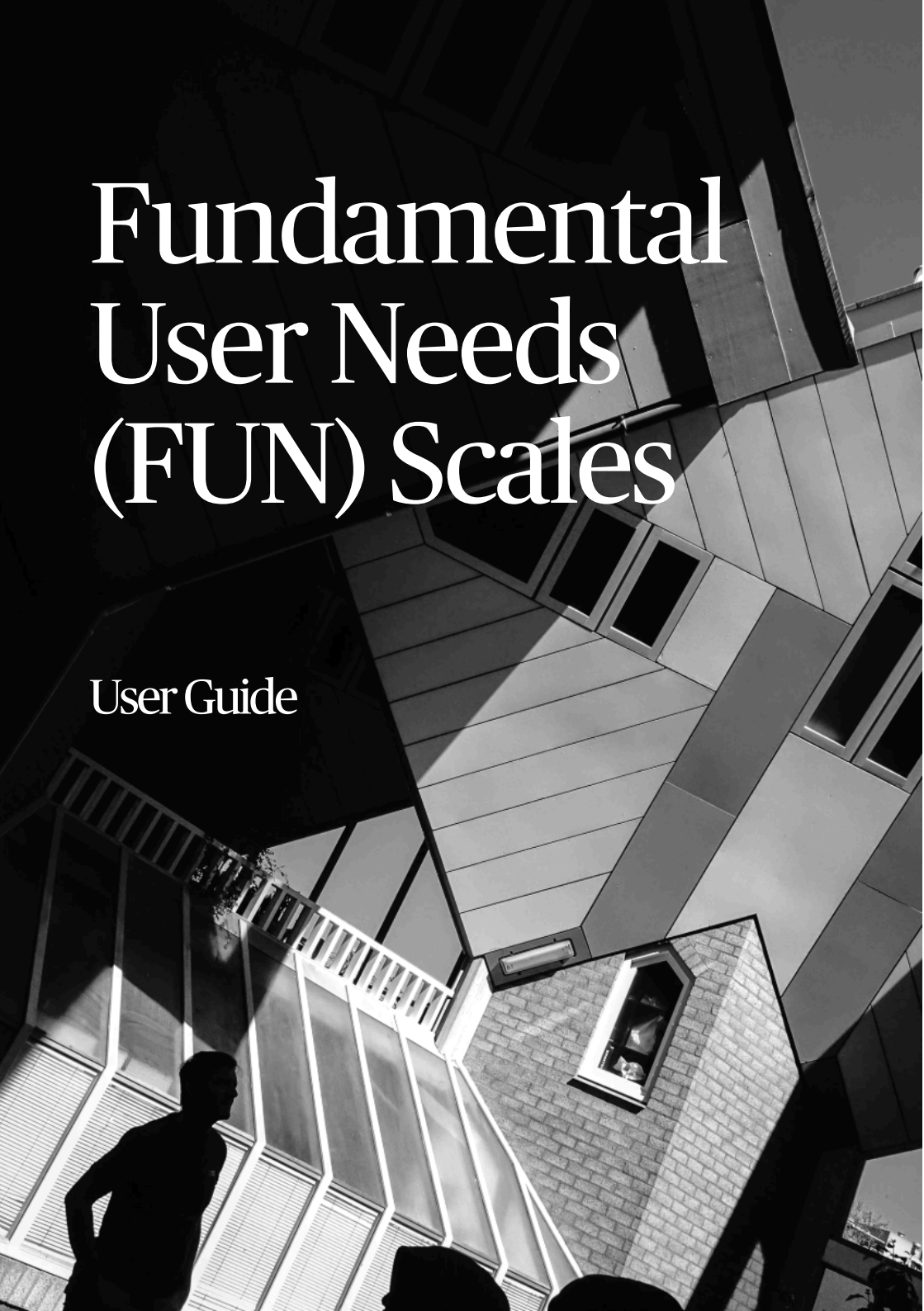


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Preface

Despite the ever-changing wishes and desires accompanying today's rapid pace of technological innovation, basic psychological needs remain enduring sources for human functioning, development, and well-being. A shared language of needs, further with design-oriented measurement tools, can inform and inspire initiatives in user-centred and/or human-centred design research and practice.

Drawing on a design-focused need typology developed by Desmet and Fokkinga (2020), which identifies thirteen distinct psychological needs—autonomy, beauty, comfort, competence, community, fitness, impact, morality, purpose, recognition, relatedness, security, and stimulation—we developed the *Fundamental User Needs (FUN) Scales* (Huang, Desmet & Mugge, 2025). These scales are tailored to evaluate the satisfaction and frustration of these needs in design-mediated interactions¹.

This user guide aims to provide an overview of the new instrument, including a complete list of items and detailed instructions for scoring and analysis. We hope it serves as a practical resource to support the effective use of the *FUN Scales* in various different research projects.

If you're interested in adapting the *FUN Scales* to other languages or exploring collaboration opportunities—whether in academia or industry—please feel free to contact us at siyuan.huang@polimi.it and P.M.A.Desmet@tudelft.nl.

¹ By 'design', we refer to a spectrum of artifacts or structures. This includes HCI designs such as smart devices, mobile applications, and interactive media, as well as objects, services, systems, and built environments.

Fundamental User Needs (FUN) Scales

The *FUN Scales* consist of two independent yet complementary scales: the *Need Satisfaction Scale* and the *Need Frustration Scale*. Each scale includes thirteen sub-scales, with each sub-scale represented by three items. You can choose to use a single scale, a combination of specific sub-scales, or the entire instrument, depending on the specific aims of your research.

Instructions

Below, we ask you about your experience and/or feelings when using/interacting with _____. Please read each of the following statements carefully and choose from “not true at all” to “extremely true” to indicate the degree to which each statement applies to you.

[illegible]

[illegible]

[illegible]

[illegible]

Scoring

General scoring

The statements in the *FUN Scales* are evaluated using a seven-point unipolar Likert scale, with ratings ranging from “1 (not true at all)” to “7 (extremely true)” for each statement. Each sub-scale in the two scales, comprised of three items, needs to be treated as an integrated unit.

Autonomy Satisfaction Score: average the scores on items 1, 2, 3.

Autonomy Frustration Score: average the scores on items 4, 5, 6.

Beauty Satisfaction Score: average the scores on items 7, 8, 9.

Beauty Frustration Score: average the scores on items 10, 11, 12.

Comfort Satisfaction Score: average the scores on items 13, 14, 15.

Comfort Frustration Score: average the scores on items 16, 17, 18.

Competence Satisfaction Score: average the scores on items 19, 20, 21.

Competence Frustration Score: average the scores on items 22, 23, 24.

Community Satisfaction Score: average the scores on items 25, 26, 27.

Community Frustration Score: average the scores on items 28, 29, 30.

Fitness Satisfaction Score: average the scores on items 31, 32, 33.

Fitness Frustration Score: average the scores on items 34, 35, 36.

Impact Satisfaction Score: average the scores on items 37, 38, 39.

Impact Frustration Score: average the scores on items 40, 41, 42.

Morality Satisfaction Score: average the scores on items 43, 44, 45.

Morality Frustration Score: average the scores on items 46, 47, 48.

Purpose Satisfaction Score: average the scores on items 49, 50, 51.

Purpose Frustration Score: average the scores on items 52, 53, 54.

Recognition Satisfaction Score: average the scores on items 55, 56, 57.

Recognition Frustration Score: average the scores on items 58, 59, 60.

Relatedness Satisfaction Score: average the scores on items 61, 62, 63.

Relatedness Frustration Score: average the scores on items 64, 65, 66.

Security Satisfaction Score: average the scores on items 67, 68, 69.

Security Frustration Score: average the scores on items 70, 71, 72.

Stimulation Satisfaction Score: average the scores on items 73, 74, 75.

Stimulation Frustration Score: average the scores on items 76, 77, 78.

The total score for each scale can be calculated using the summated score of the mean values of all sub-scales as follows:

Need Satisfaction Score = *Autonomy Satisfaction*_{mean} + *Beauty Satisfaction*_{mean} + *Comfort Satisfaction*_{mean} + *Competence Satisfaction*_{mean} + *Community Satisfaction*_{mean} + *Fitness Satisfaction*_{mean} + *Impact Satisfaction*_{mean} + *Morality Satisfaction*_{mean} + *Purpose Satisfaction*_{mean} + *Recognition Satisfaction*_{mean} + *Relatedness Satisfaction*_{mean} + *Security Satisfaction*_{mean} + *Stimulation Satisfaction*_{mean}

For the *Need Satisfaction Scale*, a higher summated score on each scale indicates greater perceived need satisfaction.

Need Frustration Score = *Autonomy Frustration*_{mean} + *Beauty Frustration*_{mean} + *Comfort Frustration*_{mean} + *Competence Frustration*_{mean} + *Community Frustration*_{mean} + *Fitness Frustration*_{mean} + *Impact Frustration*_{mean} + *Morality Frustration*_{mean} + *Purpose Frustration*_{mean} + *Recognition Frustration*_{mean} + *Relatedness Frustration*_{mean} + *Security Frustration*_{mean} + *Stimulation Frustration*_{mean}

For the *Need Frustration Scale*, no items are reverse-coded. Therefore, a higher summated score indicates greater perceived need frustration.

Percentage-converted scoring

Each scale consists of thirteen sub-scales, thus allowing for a minimum possible score of 13 and a maximum of 91. To produce a more understandable and comparable metric, as described in *Section 4* of the original paper (Huang, Desmet & Mugge, 2025), the summated score of each scale can be converted into a percentage score using the following equation:

$$y = 100 \times (x - 13) / (91 - 13)$$

The equation calculates y (the percentage-converted value of the *Need Satisfaction Scale* or the *Need Frustration scale*) by first subtracting 13 from x (the summated score of the mean values of all sub-scales) and then multiplying the result by a scaling factor of 100 divided by (91 - 13).

A similar approach can be applied to convert the scores ranging from 1 to 7 in each of the sub-scales to a percentage-based metric using the following equation:

$$y = 100 \times (x - 3) / (21 - 3)$$

Likewise, the equation calculates y (the percentage-converted value of a sub-scale within the *Need Satisfaction Scale* or *Need Frustration Scale*) by first subtracting three from x (the summated score of the three items in a sub-scale) and then multiplying the result by a scaling factor of 100 divided by (21 - 3).

Colophon

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User guide reference

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