

## Appendix: Global norm for MAP

As of 2024, a new global norm group has been implemented on the Assessio personality assessment, MAP. This appendix documents the composition and quality of this norm group.

To reflect the current state of normal, work-related behavior, the norm group was updated based on quality standards derived from various international standards, including EFPA, COTAN, and ITC guidelines. In short, these guidelines set out criteria for various aspects of the norm group:

- **Update:** When was the norm group last updated?
- **Sample size:** How large is the norm group? Is it sufficiently large to ensure representativeness?
- **Composition:** How is the norm group composed with respect to different demographics?
- **Subgroup differences:** Are group differences sufficiently small to prevent adverse impact?

### Update

Over time, what is considered normal behavior changes. Major events and crises have an impact on the way people in general behave and new generations may also challenge the existing standards. Therefore, with respect to assessments, it is highly important to update norm groups at a regular basis and make sure that all candidates and people assessed are evaluated with a norm group representing the current state and what is currently considered normal behavior, since that will provide the most valid assessment. In addition, updating the norm group keeps scores balanced and avoid too many candidates getting either high or low scores. In other words, norm updates allow for better differentiation of candidates, which in turn leads to better recruitment decisions.

According to EFPA and COTAN guidelines, a norm of the highest quality should not be older than 10 or 15 years, respectively. At Assessio, however, we are committed to checking if updates are needed at least every 2 years and update our norm groups frequently.

The new global norm replaces the 2019 norm and is based on data collected in a high-stake setting (selection and development) from 2019-2023.

### Sample size

A good norm group consists of many people, as a high number provides greater representation and statistical certainty. The prevailing view is that the larger the sample, the better the norm group. While that is true, it very much depends on sampling procedures as well as composition with respect to different demographic characteristics. In general, norm groups that are too small run the risk of underrepresentation (e.g., too few people with a certain occupation or education level), whereas too large norm groups risk overrepresentation (e.g., too many people of a certain age or nationality).

According to EFPA, a sample size of at least 1,000 constitutes an excellent norm group (in some cases, smaller norm groups may also be sufficient depending on composition, target groups, and intended applications).

The MAP norm group consists of 20,348 people who were selected through stratified randomization from a total of 227,779 people aged 18-70 who completed the assessment in a high-stake setting. Statistical analyses confirmed that the norm group does not represent a biased sample, as score

differences between different samples were only small or negligible across scales (Cohen's *d* ranging from 0.00-0.42 with an average of 0.15).

## Composition

To ensure that a norm group is representative of all target groups and is appropriate for all intended applications, key demographic characteristics must be carefully weighted and balanced, especially those that can lead to potential score differences between subgroups.

To construct a proper global norm, the sample was stratified for gender at the nationality level, hence making each nationality contributing an equal number of main genders (M and F). Then, nationalities were stratified such that each nationality constituted a maximum of 2.5 % of the total norm group. Next, other genders were added to the norm group as well with aim of having a representation of roughly 1 % but with the restriction that this addition did not cause any nationality to be largely overrepresented.

Although the final age distribution was slightly skewed to the left (with a median of 32), statistical analyses revealed no significant relationships between age and any of the scores as evidenced by very low correlations ranging from -.16 to .09, with absolute values averaging just .08. Therefore, it was deemed unnecessary to stratify for age, as this would only reduce the sample size without impacting overall scores across age groups. As the final sample comprised a proper range of education levels and occupations (job families), and there were no major score differences, the sample was not further stratified for any of these demographic variables.

The demographic composition of the final norm group is listed below in table A1.

**Table A1.** *Demographic composition of the global norm for MAP.*

<b>MAP: Global norm</b>	
<b>Last updated</b>	2024
<b>Data collection</b>	20219-2023
<b>Sample size</b>	20,348
<b>Composition</b>	
Purpose(s)	Selection: 73 % Development: 27 %
Age	18-70 (M = 34.0, SD = 9.57)
Gender	49.8% females 49.8% males .4% other
Nationalities	162, Max. = 2.54 %
<b>Education level (%)</b>	
Elementary school	2.6
Less than 3 years of post-secondary education	12.7
Middle/Junior high/High school	21.3
Other	3.9
PhD	2.5
Unknown	.3
3 or more years of post-secondary education	56.7

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<b>Job family (%)</b>	
Architecture and engineering	4.4
Arts design entertainment sports and media	2.4
Building and grounds	1.8
Business and financial operations	9.4
Cleaning and maintenance	1.4
Community and social service	1.3
Computer and mathematical	5.5
Construction and extraction	0.8
Education training and library	3.4
Farming fishing and forestry	.4
Food preparation and serving related	2.1
Healthcare practitioners and technical	2.9
Healthcare support	1.3
Installation maintenance and repair	2.5
Legal	1.1
Life physical and social science	1.9
Management	5.5
Military specific	.1
Office and administrative support	7.0
Other	23.7
Personal care and service	1.2
Unknown	2.7
Production	4.8
Protective service	0.6
Sales and related	6.9
Transportation and material moving	5.0

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### **Subgroup differences**

Finally, to further substantiate the quality of the norm group composition, subgroup differences were examined with independent samples t-tests for test purpose, gender and age dichotomized as follows:

- **Purpose:** Selection (n = 14,872) vs. Development (n = 5,476)
- **Gender:** Female (n = 10,219) vs. Male (n = 10,219)
- **Age:** 40 years and above (n = 5,095) vs. below 40 years (n = 15,253)

The results of these tests are listed below in Table A2 (please note that p-values are omitted, as they are not interpretable due to multiple testing and very high sample sizes).

The analyses showed that effect sizes (Cohen's d) were small (< .50) or negligible (< 0.20) for most scales, ranging from 0.00-0.34 across scales and demographic variables, averaging .16, .12, and .14 for purpose, gender, and age, respectively. With such small subgroup differences, any adverse impact is unlikely to occur for moderate and lenient selection ratios. However, please keep in mind that this notion is based on the rather theoretical assumption that people are selected based on a single scale score (which is usually not the case in actual practice). Also, Assessio does not recommend basing recruitment decisions on any single score but rather to combine scores and information derived from different sources.

In addition, the small differences between scores observed for selection compared to development purposes makes possible the calculation of scores on just a single norm. Importantly, this allows data to be reused across the recruitment and development modules in the Assessio platform.

In conclusion, the global norm for the MAP assessment constitutes a large, well-composed sample that is suitable for the intended target groups and applications (selection as well as development).

**Table A2.** Analyses of subgroup differences for test purpose (selection/development).

Scale	Purpose			Gender			Age		
	Dif.	t	d	Dif.	t	d	Dif.	t	d
<b>Extraversion</b>	<b>-0.4</b>	<b>-2.06</b>	<b>0.03</b>	<b>0.4</b>	<b>2.15</b>	<b>0.03</b>	<b>-3.3</b>	<b>-15.6</b>	<b>0.25</b>
Social Need	0.3	4.99	0.08	0.2	3.22	0.04	-0.5	-8.56	0.14
Social Image	0.0	-0.26	0.01	-0.2	-4.58	0.06	-0.6	-8.84	0.14
Pace of Life	0.1	1.32	0.02	0.3	6.10	0.09	-0.4	-8.41	0.14
Excitement Seeking	-0.4	-7.98	0.13	-0.5	-11.6	0.16	-1.0	-17.6	0.29
Cheerfulness	-0.3	-6.02	0.10	0.8	14.8	0.21	-0.8	-13.8	0.22
<b>Openness</b>	<b>0.0</b>	<b>-0.02</b>	<b>0.00</b>	<b>1.4</b>	<b>8.37</b>	<b>0.12</b>	<b>-3.5</b>	<b>-18.4</b>	<b>0.30</b>
Imagination	-0.6	-12.0	0.19	-0.2	-3.48	0.05	-0.9	-16.2	0.26
Aesthetics	-0.1	-1.10	0.02	1.1	16.1	0.22	-0.7	-8.94	0.14
Emotional Sensitivity	0.5	12.0	0.19	0.8	19.6	0.28	-0.2	-3.09	0.05
Experiences	0.1	1.38	0.02	0.2	4.82	0.07	-0.7	-13.1	0.21
Mindset	0.1	1.84	0.03	-0.5	-8.94	0.13	-1.1	-17.8	0.29
<b>Conscientiousness</b>	<b>2.6</b>	<b>14.9</b>	<b>0.23</b>	<b>0.9</b>	<b>5.70</b>	<b>0.08</b>	<b>-2.4</b>	<b>-13.0</b>	<b>0.21</b>
Intensity	0.6	14.1	0.22	-0.1	-1.32	0.02	-0.3	-7.65	0.12
Diligence	0.4	9.41	0.15	0.4	10.2	0.14	-0.3	-7.99	0.13
Ambition	0.4	8.48	0.14	0.2	5.88	0.08	-0.6	-13.8	0.22
Self-Discipline	0.8	15.6	0.25	0.4	7.99	0.11	-0.4	-7.13	0.12
Decision Making	0.5	9.53	0.15	0.0	-0.38	0.00	-0.7	-14.3	0.23
<b>Emotional Stability</b>	<b>3.7</b>	<b>17.6</b>	<b>0.28</b>	<b>-0.8</b>	<b>-4.34</b>	<b>0.06</b>	<b>1.1</b>	<b>5.02</b>	<b>0.08</b>
Emotions	0.5	8.52	0.13	-0.4	-8.29	0.12	0.5	8.84	0.15
Temper	0.9	16.46	0.26	0.1	2.01	0.03	0.1	1.12	0.02
Confidence	0.7	12.4	0.19	-0.5	-9.46	0.13	0.5	7.52	0.12
Self-Control	1.0	17.9	0.28	0.2	3.89	0.05	0.2	3.67	0.06
Stress	0.6	11.9	0.19	-0.2	-4.20	0.06	-0.2	-3.07	0.05
<b>Agreeableness</b>	<b>3.9</b>	<b>21.4</b>	<b>0.34</b>	<b>2.9</b>	<b>18.1</b>	<b>0.25</b>	<b>0.8</b>	<b>4.08</b>	<b>0.07</b>
Trust	1.2	21.4	0.34	0.5	9.43	0.13	0.5	8.34	0.13
Communication	0.6	9.77	0.16	0.5	10.3	0.14	0.3	4.53	0.07
Altruism	0.7	13.9	0.22	0.4	10.2	0.15	-0.1	-2.19	0.03
Compassion	0.7	13.9	0.22	0.8	18.4	0.26	0.1	2.47	0.04
Affection	0.8	16.0	0.25	0.7	15.4	0.22	0.0	0.14	0.00