Generative Al and Gender

Global Measures of Workers in GAI Classifications

Key Takeaways

- Generative Al has the potential to impact several occupations, both in complementing and replicating skills. Using a skills-based approach, we can classify each occupation into one likely to be auamented, disrupted, or insulated from GAI's impact.
- There are gender gaps across countries, with percentage point gaps usually in the single digits for any given country. For example, in the US, 24.1% of men work in augmented occupations, while 20.5% of women work in augmented occupations. Meanwhile, 25.5% of men work in disrupted occupations in the US, compared to 33.7% of women.
- Across most countries, women are more likely than men to be in disrupted occupations. Women are also less likely to be in augmented and insulated occupations. For 95% of the countries we examine, out of all occupations the share of men working in augmented occupations exceeds the share of women in augmented occupations. Meanwhile, 93% of countries have a higher share of women in disrupted occupations than for men in similar roles.

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Women are more likely than men to work in GAIdisrupted occupations

Generative Artificial Intelligence (GAI) is a monumental technological development which may be poised to change how many jobs function. GAI is far-reaching, touching many occupations, not just those in the technology sector, and is advancing the speed at which skills in a job change. Using the methodology from our past report, we classify each occupation into one of three groups based on the skills used in the given occupation: occupations likely to be augmented by GAI, occupations likely to be disrupted by GAI, and occupations likely to be insulated by GAI. The table below provides brief definitions and examples of each classification. In this report, we leverage LinkedIn's global data of members and their profiles to evaluate the occupations each member works in, and which of the three

¹ <u>Kimbrough, K. and M. Carpanelli (2023). "Preparing the Workforce for Generative Al. Insights and Implications." LinkedIn Economic Graph Research Note.</u>

Lewis, G. (2023). "3 Takeaways for Recruiters from LinkedIn's New Al Research." LinkedIn Talent Blog.



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GAI classifications their occupation falls within. This allows us to estimate the share of men in each of the three classifications compared to the share of women, across many countries.

In nearly all of the countries (95.9%), men are more likely than women to be working in GAI augmented occupations. For example, in France, 27.4% of men work in occupations classified as GAI-augmented, while only 22.6% of women do. In the US, 24.1% of men work in augmented occupations compared to 20.5% of women. In the UK, that same gap is present, with 27.5% of men in augmented occupations versus 24.7% of women working in augmented occupations. Men are also more likely than women to work in insulated occupations in almost all countries (93.2% of countries), while women are more likely to work in disrupted occupations than men in most countries (95.9%). For example, in the UK 37.1% of women work in disrupted occupations, compared to 27.5% of men.

GAI classification	Higher share in	Share of
	classification for	countries
Augmented by GAI: These jobs' core skills include a large share	Men	95.9%
of both GAI-replicable and people skills. Example: Data Analysts		
automate the computation and interpretation of metrics with GAI,	\	4 7 0/
enabling them to focus their time on people skills, such as cross-	Women	4.1%
functional influencing and stakeholder engagement.		
Disrupted by GAI: These jobs' core skills include a large share of	Men	4.1%
GAI-replicable and a relatively low share of people skills.		
Example: Language translators' skills shift from doing translations		
from scratch to reviewing and certifying machine-generated	Women	95.9%
translations, or to specializing on specific legal or literary domains.		
Insulated from GAI: These jobs have a relatively small proportion	Men	93.2%
of GAI-replicable skills in their core skills (note that some of these		
jobs may be susceptible to other forms of automation, such as		
robotics). Example: Real estate agents might utilize GAI for	Women	6.8%
writing house descriptions, but core relationship management	vvoirieii	0.0%
skills would be insulated from GAI.		

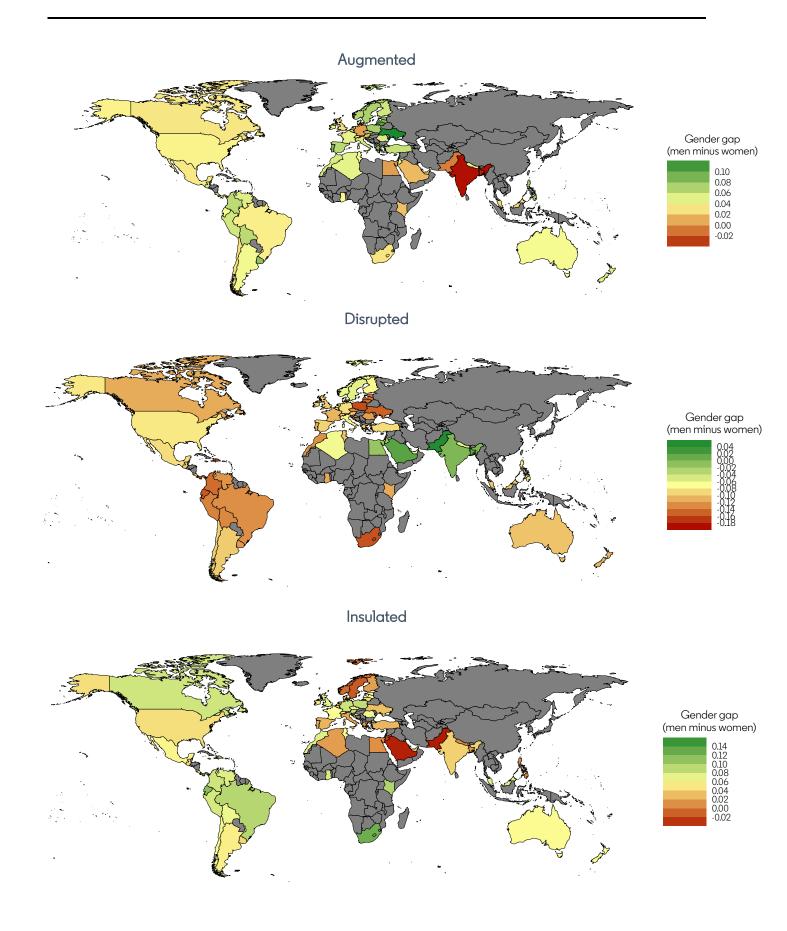
There is variance between countries in the extent of the gaps

Of the 74 countries we examine, men hold a ten-percentage point advantage over women for the share of workers in augmented occupations for two countries: Ukraine (11.9 percentage points—pp) and Lithuania (10.1pp), with the rest less than 10 percentage points. Meanwhile, in examining disrupted occupation shares, 37 countries have a greater than 10 percentage point deficit for women, with the largest gaps being for Trinidad and Tobago (18.3pp), Dominican Republic (16.8pp), the Bahamas (16.6pp), and Barbados (16.3pp). For insulated occupations, men display at least a ten-percentage point lead over women in 7 of the countries, with the Bahamas (15.8pp), Trinidad and Tobago (15.0pp), and Barbados (13.8pp) having the largest gaps.

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Taken all together, over 90% of countries follow the same pattern where men hold an advantage over women in the share working in augmented and in insulated occupations, while women have a higher share working in disrupted occupations. The Appendix contains the full results for each country.

The maps show the gender gaps for all evaluated countries. The gender gap for Augmented is larger in many European countries as well as countries in northwestern South America. The gap is somewhat smaller in North American countries, and smaller still in many countries in Africa, the Middle East, and Southern Asia. When viewing disrupted occupations, we find the largest disparities in Eastern Europe and parts of South America, with smaller gaps in North America and Northern Europe.

The appendix contains a chart for the gap in each country, as well as a table with each value for each country.

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Acknowledgements

We gratefully acknowledge the support and feedback of many individuals in this report. These include Simone Bell, Chris Grant, MK Juric, and Anne Trapasso.

Methodology

Data and Privacy

This body of work represents the world seen through Linkedln data, drawn from the anonymized and aggregated profile information of Linkedln's 930+ million members around the world. As such, it is influenced by how members choose to use the platform, which can vary based on professional, social, and regional culture, as well as overall site availability and accessibility.

In publishing these insights from LinkedIn's Economic Graph, we want to provide accurate statistics while ensuring our members' privacy. As a result, all data show aggregated information for the corresponding period following strict data quality thresholds that prevent disclosing any information about specific individuals.

Generative Al Classifications (reproduced from Kimbrough & Carpanelli 2023)

GAI-replicable and GAI-complementary skills

We identify GAI-replicable and GAI-complementary skills with the following steps:

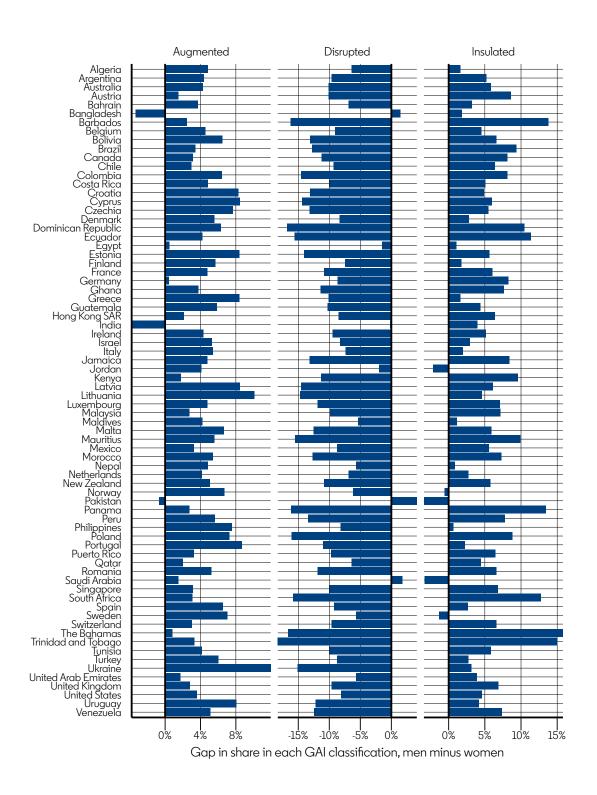
- 1. We ask ChatGPT 3.5 (Feb 2023) the following prompts:
 - a. "What are the 100 top skills that AI technologies (ChatGPT, Dall-E, LaMDA, etc.) can perform very well?"
- b. "What are the 100 top skills that can currently exclusively be performed by humans?" We map these lists to Linkedln's taxonomy with Linkedln's taxonomy API, and we refine matches manually.

- 2. We expand coverage further by applying skill similarities based on skill embeddings to score kills that are similar to those flagged in each list, and by manually reviewing the skills in the popular skill groups containing the skills from the previous steps.
- 3. For external validation, we ingest and map to our taxonomy three exposure scores from the academic literature (Webb (2019); Felten, Raj, & Seamans (2023), and Felten, Raj, & Seamans (2021)). We use these scores to train a model that learns which skills contribute more to these three rankings, and we use this model to score all skills in LinkedIn's taxonomy.

Occupations exposed to GAI and complementary skills

To calculate the percentage of skills that are exposed to GAI by occupation, we use each occupation's skills genome. An occupation's skills genome is the ranking of its top 30 most relevant skills based on a TF-IDF model. In this model, skills are relevant when they tend to be disproportionately added by members in this occupation compared to other occupations.

The thresholds for classifying occupations into high and low exposure to GAI and to GAI-complementary skills are based on the metrics' medians.



Share of workers in each GAI classification, by country and gender

Country	Classification	Men	Women	Gap
Algeria	Augmented	24.9%	20.1%	4.8pp
Algeria	Disrupted	28.5%	35.0%	-6.4pp
Algeria	Insulated	46.6%	45.0%	1.6pp
Argentina	Augmented	24.0%	19.6%	4.4pp
Argentina	Disrupted	34.0%	43.6%	-9.6pp
Argentina	Insulated	42.0%	36.8%	5.2pp
Australia	Augmented	25.7%	21.4%	4.3pp
Australia	Disrupted	26.1%	36.2%	-10.1pp
Australia	Insulated	48.2%	42.4%	5.8pp
Austria	Augmented	28.2%	26.7%	1.5pp
Austria	Disrupted	26.7%	36.8%	-10.1pp
Austria	Insulated	45.1%	36.5%	8.6pp
Bahrain	Augmented	29.3%	25.6%	3.7pp
Bahrain	Disrupted	33.6%	40.5%	-6.9pp
Bahrain	Insulated	37.1%	33.9%	3.2pp
Bangladesh	Augmented	42.2%	45.5%	-3 . 3pp
Bangladesh	Disrupted	31.3%	29.8%	1.5pp
Bangladesh	Insulated	26.5%	24.7%	1.8pp
Barbados	Augmented	23.6%	21.1%	2.5pp
Barbados	Disrupted	25.1%	41.3%	-16.3pp
Barbados	Insulated	51.4%	37.6%	13.8pp
Belgium	Augmented	27.6%	23.1%	4.5pp
Belgium	Disrupted	29.2%	38.3%	-9.1pp
Belgium	Insulated	43.2%	38.6%	4.5pp
Bolivia	Augmented	27.9%	21.4%	6.5pp
Bolivia	Disrupted	31.0%	44.1%	-13.1pp
Bolivia	Insulated	41.1%	34.5%	6.6pp

Country	Classification	Men	Women	Gap
Brazil	Augmented	21.2%	17.8%	3.4pp
Brazil	Disrupted	33.4%	46.2%	-12.8pp
Brazil	Insulated	45.4%	36.0%	9.4pp
Canada	Augmented	24.7%	21.5%	3.2pp
Canada	Disrupted	25.8%	37.1%	-11.3pp
Canada	Insulated	49.5%	41.4%	8.1pp
Chile	Augmented	26.4%	23.4%	3.0pp
Chile	Disrupted	28.4%	37.8%	-9.3pp
Chile	Insulated	45.2%	38.8%	6.4pp
Colombia	Augmented	23.6%	17.2%	6.4pp
Colombia	Disrupted	32.5%	47.0%	-14.6pp
Colombia	Insulated	43.9%	35.7%	8.2pp
Costa Rica	Augmented	27.8%	23.0%	4.9pp
Costa Rica	Disrupted	34.6%	44.6%	-9.9pp
Costa Rica	Insulated	37.5%	32.5%	5.1pp
Croatia	Augmented	33.5%	25.2%	8.3pp
Croatia	Disrupted	26.0%	39.1%	-13.1pp
Croatia	Insulated	40.6%	35.7%	4.9pp
Cyprus	Augmented	33.6%	25.2%	8.4pp
Cyprus	Disrupted	27.7%	42.1%	-14.4pp
Cyprus	Insulated	38.7%	32.8%	6.0pp
Czechia	Augmented	32.8%	25.2%	7.7pp
Czechia	Disrupted	29.5%	42.6%	-13.1pp
Czechia	Insulated	37.7%	32.2%	5.5pp
Denmark	Augmented	25.7%	20.1%	5.5pp
Denmark	Disrupted	26.8%	35.1%	-8 . 3pp
Denmark	Insulated	47.5%	44.8%	2.8pp
Dominican Republic	Augmented	26.2%	19.9%	6.3pp
Dominican Republic	Disrupted	34.0%	50.8%	-16.8pp
Dominican Republic	Insulated	39.8%	29.3%	10.5pp
Ecuador	Augmented	23.5%	19.3%	4.2pp

Country	Classification	Men	Women	Gap
Ecuador	Disrupted	30.1%	45.7%	-15.6pp
Ecuador	Insulated	46.4%	35.0%	11.4pp
Egypt	Augmented	25.5%	25.0%	0.5pp
Egypt	Disrupted	41.8%	43.3%	-1.5pp
Egypt	Insulated	32.7%	31.6%	1.0pp
Estonia	Augmented	37.2%	28.8%	8.4pp
Estonia	Disrupted	22.9%	36.9%	-14.0pp
Estonia	Insulated	39.9%	34.2%	5.6pp
Finland	Augmented	29.8%	24.1%	5.7pp
Finland	Disrupted	27.1%	34.6%	-7.4pp
Finland	Insulated	43.1%	41.3%	1.8pp
France	Augmented	27.4%	22.6%	4.8pp
France	Disrupted	27.8%	38.7%	-10.9pp
France	Insulated	44.8%	38.7%	6.1pp
Germany	Augmented	30.0%	29.6%	0.5pp
Germany	Disrupted	27.0%	35.7%	-8.7pp
Germany	Insulated	43.0%	34.8%	8.2pp
Ghana	Augmented	23.5%	19.7%	3.8pp
Ghana	Disrupted	29.7%	41.1%	-11.4pp
Ghana	Insulated	46.8%	39.2%	7.6pp
Greece	Augmented	29.1%	20.7%	8.4pp
Greece	Disrupted	30.6%	40.7%	-10.1pp
Greece	Insulated	40.3%	38.6%	1.7pp
Guatemala	Augmented	27.3%	21.5%	5.9pp
Guatemala	Disrupted	37.7%	47.9%	-10.2pp
Guatemala	Insulated	35.0%	30.6%	4.4pp
Hong Kong SAR	Augmented	33.1%	31.0%	2.1pp
Hong Kong SAR	Disrupted	34.9%	43.4%	-8 . 5pp
Hong Kong SAR	Insulated	32.0%	25.6%	6.4pp
India	Augmented	36.7%	40.4%	-3.8pp
India	Disrupted	32.3%	32.5%	-0.2pp

Country	Classification	Men	Women	Gap
India	Insulated	31.0%	27.1%	4.0pp
Ireland	Augmented	28.4%	24.1%	4.3pp
Ireland	Disrupted	28.2%	37.7%	-9.5pp
Ireland	Insulated	43.4%	38.2%	5.2pp
Israel	Augmented	40.2%	34.9%	5.3pp
Israel	Disrupted	24.1%	32.4%	-8 . 3pp
Israel	Insulated	35.7%	32.7%	3.0pp
Italy	Augmented	25.7%	20.2%	5.4pp
Italy	Disrupted	31.9%	39.3%	-7.4pp
Italy	Insulated	42.5%	40.5%	2.0pp
Jamaica	Augmented	22.7%	17.9%	4.8pp
Jamaica	Disrupted	30.7%	43.9%	-13.2pp
Jamaica	Insulated	46.6%	38.2%	8.4pp
Jordan	Augmented	27.4%	23.3%	4.1pp
Jordan	Disrupted	36.3%	38.3%	-2.0pp
Jordan	Insulated	36.3%	38.5%	-2.2pp
Kenya	Augmented	25.5%	23.8%	1.8pp
Kenya	Disrupted	31.5%	42.9%	-11.3pp
Kenya	Insulated	42.9%	33.4%	9.6pp
Latvia	Augmented	32.5%	24.1%	8.4pp
Latvia	Disrupted	25.4%	40.0%	-14.6pp
Latvia	Insulated	42.1%	35.9%	6.lpp
Lithuania	Augmented	38.1%	28.0%	10.1pp
Lithuania	Disrupted	24.8%	39.4%	-14.7pp
Lithuania	Insulated	37.1%	32.6%	4.6pp
Luxembourg	Augmented	26.6%	21.8%	4.8pp
Luxembourg	Disrupted	37.1%	48.9%	-11.9pp
Luxembourg	Insulated	36.4%	29.3%	7.1pp
Malaysia	Augmented	31.3%	28.6%	2.7pp
Malaysia	Disrupted	29.3%	39.2%	-9.9pp
Malaysia	Insulated	39.4%	32.3%	7.2pp

Country	Classification	Men	Women	Gap
Maldives	Augmented	37.1%	32.9%	4.2pp
Maldives	Disrupted	21.7%	27.1%	-5.4pp
Maldives	Insulated	41.2%	40.1%	1.2pp
Malta	Augmented	31.1%	24.4%	6.7pp
Malta	Disrupted	28.2%	40.7%	-12.5pp
Malta	Insulated	40.7%	34.9%	5.9pp
Mauritius	Augmented	30.5%	24.9%	5.6pp
Mauritius	Disrupted	30.4%	45.9%	-15.5pp
Mauritius	Insulated	39.1%	29.2%	9.9pp
Mexico	Augmented	26.4%	23.2%	3.2pp
Mexico	Disrupted	34.8%	43.6%	-8.8pp
Mexico	Insulated	38.8%	33.2%	5.5pp
Morocco	Augmented	30.7%	25.3%	5.4pp
Morocco	Disrupted	29.7%	42.4%	-12.7pp
Morocco	Insulated	39.6%	32.3%	7.3pp
Nepal	Augmented	31.8%	27.0%	4.8pp
Nepal	Disrupted	29.0%	34.7%	-5.7pp
Nepal	Insulated	39.2%	38.3%	0.9pp
Netherlands	Augmented	25.2%	21.0%	4.2pp
Netherlands	Disrupted	26.5%	33.4%	-6.9pp
Netherlands	Insulated	48.3%	45.6%	2.7pp
New Zealand	Augmented	25.5%	20.4%	5.1pp
New Zealand	Disrupted	25.6%	36.5%	-10.9pp
New Zealand	Insulated	49.0%	43.2%	5.8pp
Norway	Augmented	31.2%	24.4%	6.7pp
Norway	Disrupted	24.5%	30.6%	-6.1pp
Norway	Insulated	44.4%	45.0%	-0.6pp
Pakistan	Augmented	33.5%	34.2%	-0.7pp
Pakistan	Disrupted	33.2%	29.1%	4.1pp
Pakistan	Insulated	33.3%	36.7%	-3 . 4pp
Panama	Augmented	26.6%	23.8%	2.8pp

Country	Classification	Men	Women	Gap
Panama	Disrupted	31.4%	47.6%	-16.2pp
Panama	Insulated	42.0%	28.6%	13.4pp
Peru	Augmented	29.2%	23.6%	5.6pp
Peru	Disrupted	30.5%	43.9%	-13.4pp
Peru	Insulated	40.4%	32.6%	7.8pp
Philippines	Augmented	29.1%	21.6%	7.5pp
Philippines	Disrupted	31.7%	39.9%	-8 . 2pp
Philippines	Insulated	39.2%	38.5%	0.7pp
Poland	Augmented	33.5%	26.2%	7.3pp
Poland	Disrupted	24.7%	40.8%	-16.1pp
Poland	Insulated	41.9%	33.1%	8.8pp
Portugal	Augmented	28.1%	19.4%	8.7pp
Portugal	Disrupted	27.2%	38.2%	-11.0pp
Portugal	Insulated	44.7%	42.4%	2.3pp
Puerto Rico	Augmented	22.8%	19.6%	3.2pp
Puerto Rico	Disrupted	28.6%	38.3%	-9.7pp
Puerto Rico	Insulated	48.6%	42.1%	6.5pp
Qatar	Augmented	26.1%	24.1%	2.0pp
Qatar	Disrupted	29.6%	36.0%	-6 . 4pp
Qatar	Insulated	44.4%	39.9%	4.4pp
Romania	Augmented	35.8%	30.5%	5.2pp
Romania	Disrupted	28.6%	40.4%	-11.9pp
Romania	Insulated	35.7%	29.0%	6.6pp
Saudi Arabia	Augmented	25.4%	23.9%	1.5pp
Saudi Arabia	Disrupted	36.7%	34.9%	1.8pp
Saudi Arabia	Insulated	37.9%	41.2%	-3.3pp
Singapore	Augmented	35.4%	32.3%	3.1pp
Singapore	Disrupted	28.8%	38.8%	-10.0pp
Singapore	Insulated	35.7%	28.9%	6.8pp
South Africa	Augmented	24.1%	21.0%	3.1pp
South Africa	Disrupted	29.2%	45.0%	-15.8pp

Country	Classification	Men	Women	Gap
South Africa	Insulated	46.7%	34.0%	12.7pp
Spain	Augmented	30.7%	24.2%	6.6pp
Spain	Disrupted	28.0%	37.2%	-9.2pp
Spain	Insulated	41.3%	38.6%	2.7pp
Sweden	Augmented	27.3%	20.2%	7.0pp
Sweden	Disrupted	26.7%	32.4%	-5.7pp
Sweden	Insulated	46.0%	47.3%	-1.3pp
Switzerland	Augmented	28.5%	25.4%	3.0pp
Switzerland	Disrupted	26.5%	36.1%	-9.6pp
Switzerland	Insulated	45.0%	38.4%	6.6pp
The Bahamas	Augmented	23.2%	22.4%	0.8pp
The Bahamas	Disrupted	21.1%	37.7%	-16.6pp
The Bahamas	Insulated	55.6%	39.8%	15.8pp
Trinidad and Tobago	Augmented	21.3%	18.0%	3.3pp
Trinidad and Tobago	Disrupted	24.2%	42.5%	-18 . 3pp
Trinidad and Tobago	Insulated	54.6%	39.6%	15.0pp
Tunisia	Augmented	30.2%	26.1%	4.1pp
Tunisia	Disrupted	26.1%	36.1%	-10.0pp
Tunisia	Insulated	43.7%	37.9%	5.8pp
Turkey	Augmented	29.4%	23.4%	6.0pp
Turkey	Disrupted	28.6%	37.3%	-8.7pp
Turkey	Insulated	42.0%	39.3%	2.7pp
Ukraine	Augmented	42.6%	30.7%	11.9pp
Ukraine	Disrupted	25.3%	40.4%	-15.1pp
Ukraine	Insulated	32.1%	28.9%	3.2pp
United Arab Emirates	Augmented	28.0%	26.2%	1.7pp
United Arab Emirates	Disrupted	33.7%	39.4%	-5.7pp
United Arab Emirates	Insulated	38.3%	34.4%	3.9pp
United Kingdom	Augmented	27.5%	24.7%	2.8pp
United Kingdom	Disrupted	27.5%	37.1%	-9.7pp
United Kingdom	Insulated	45.0%	38.2%	6.9pp

Country	Classification	Men	Women	Gap
United States	Augmented	24.1%	20.5%	3.6pp
United States	Disrupted	25.5%	33.7%	-8.1pp
United States	Insulated	50.4%	45.8%	4.6pp
Uruguay	Augmented	25.6%	17.6%	8.1pp
Uruguay	Disrupted	29.5%	41.7%	-12.2pp
Uruguay	Insulated	44.9%	40.7%	4.1pp
Venezuela	Augmented	24.1%	19.1%	5.1pp
Venezuela	Disrupted	31.7%	44.2%	-12.5pp
Venezuela	Insulated	44.1%	36.8%	7.4pp