Prioritising climate change actions post COVID-19 amongst university students; a Q methodology perspective in the United Arab Emirates

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Abstract

The COVID-19 pandemic caused global implementation of strict guidelines and regulations to lower transmission rates. Some industries were shut down, many people spent time in lockdown, and travel was severely curtailed. In particular, travel by air was substantially reduced. Restrictions were in effect for a long enough period for people's behaviour to change. For example, working from home and holding meetings online rather than needing to travel. This opens the possibility for alterations to the perception that it is possible to commit to effective climate change actions by reducing travel and therefore greenhouse gas emissions. A study using Q Methodology was conducted to analyze how a sample of 33 environmental students from universities across the United Arab Emirates perceive the importance of prioritizing climate change actions post-pandemic. Statistical analysis yielded four factors corresponding to four distinct discourses. The first emphasises the need to learn lessons about climate sustainability from lockdown and sustain them post-pandemic. The second is more pessimistic but advocates preventing a return to pre-pandemic norms by implementing post-pandemic climate change regulations. The third emphasizes the role of different stakeholders and expects economic recovery to take priority over reducing emissions. The fourth raises other opportunities and challenges for environmental sustainability post-Covid-19.

1. Introduction

Severity of the COVID-19 pandemic resulted in industries being shut down and travel being severely curtailed to prevent transmission of the virus, so much so that the pandemic was not only considered a health crisis, but an economic crisis as well (WHO, 2020). However, the COVID-19 pandemic is not the only global emergency. Climate change remains the biggest threat to humanity and there have been repeated calls for immediate adaption and mitigation strategies (Pecl et al., 2013). However, greenhouse gas emissions have continued to rise, and political action limited in extent and effect (IPCC, 2014) despite manifestations of climate change impacts such as fires (Flannigan et al.,2020), hurricanes (Marsooli et al., 2019), floods (Cheng et al., 2017), reduction of polar ice (Everinghaus, 1999) and increased temperature extremes in the Middle East and North Africa (MENA) in the 21st century (Lelieveld et al., 2016).

The pandemic demonstrates not only that governments are able to rapidly implement strict regulations and shut down whole industries; but individuals, families and communities are able to rapidly adapt to new lifestyles and accept the concomitant limitations (Kumari et al., 2020). Many of these behavioural changes are coincidentally associated with lowered emissions of greenhouse gases (GHG), most notably reduced commuting and travel by air (Sarkis, 2020). In many cases,

business meetings and conferences that previously required face-to-face interaction, have been successfully replaced with online meetings thereby saving travel time, cost and CO_2 (Lau,2020).

The quick and substantial regulatory and behavioural changes that occurred during the pandemic demonstrate that effective climate-change mitigation actions are possible (Bavel et al., 2020). Climate change is one of the major threats for Gulf countries including the United Arab Emirates (UAE). With the current pandemic shifting the focus from environmental priorities to health and livelihood matters, policy implementation has become a challenge for both governments and individuals. In order to evaluate public perceptions of environmentally concerned students on this topic, we asked students studying for environmental degrees in the UAE to evaluate a set of statements covering various different viewpoints related to COVD-19 and climate change in the UAE. The ranking of the statements was analysed using Q-methodology to create series of discourses.

2. COVID-19 and Climate Change

To control the spread of the novel coronavirus, governments worldwide introduced strict regulations. As a consequence, global carbon emissions were reduced due to people staying at home, movement restrictions, decline in transportation systems' fossil fuel consumption (Chen et al., 2020)and decline in air travel. Estimates of air pollution in New York during the 2020 COVID-19 lock-down were 50 percent lower than the previous year and emissions in China decreased by 25 percent since the World Health Organization declared the pandemic to be a global health emergency (Saadat, 2020).

However, GHG emissions are likely to rise again as soon as the virus is confined and life returns to 'normal' as industries, such as the tourism and fossil fuel sectors, speed up their recovery processes. An alternative scenario is to assume that people have seen that adaptation to change is possible and are willing to accept or adopt to similar restrictions post-pandemic in order to reduce GHG emissions (Jackson et al, 2020).

Some commentators have observed that there are similarities between the COVID-19 crisis and the climate emergency (Manzanedo, 2020; Sulistiawati, 2020). Both crises present a global problem, which requires international cooperation to reduce its impacts. More importantly, both crises have been predictable. The measures taken to counter the pandemic have been shown to be beneficial for the climate. Continuing these actions post-pandemic will not only reduce the severity of climate change impacts but will be less costly than to intervene. In particular, less developed countries depend on efficient preventive measures since they will suffer the most from the impacts as well as are least-able to afford mitigation and adaptation strategies (Manzanedo, 2020). Compared to the climate crisis, the COVID-19 pandemic is an immediately dramatic but short-term problem, whereas climate change impacts have built up over time and might not be reversible if insufficient action is taken.

Despite the GHG emission reductions during the pandemic, there are fears that once the restrictions are lifted, emission levels will return (Hepburn, 2020). This suggests that when developing COVID-19 recovery packages, climate actions should be included in priorities. "Any recovery

measures must not be focused on bailing out the largest and most-polluting companies; rather, they should be used wisely, to facilitate a fair transition." (Colli, 2020). For example, integrating the so called "European Green Deal" into the COVID-19 recovery packages is a possible way to redesign economies sustainably post-pandemic. The European Green Deal is a set of guidelines directing the way into a sustainable economy, which prioritizes the restoration of biodiversity and reduction of pollution in favour of tackling climate change (European Commission, n.d.).

According to the UAE National Climate Change Plan, national vulnerability is increased, and the UAE's development goals hampered, by climate change (NCCP, 2017). The UAE has already put in place the ground rules for green growth and combating climate change (NCCP, 2017) with a focus on renewables and nuclear energy. However, in 2010, the UAE ranked 11th the world in terms of per capita CO_2 emissions; in 2019, emissions per capita were still among the highest in the world (OWD 2021).

On the 29th of April 2020, the UAE joined the 11th Petersberg Climate Dialogue, together with over 30 environmental ministers worldwide as well as German Chancellor Angela Merkel and the UAE's Minister of Climate Change & Environment, Dr. Thani bin Ahmed Al Zeyoudi. The virtual meeting addressed the introduction of a green recovery from the COVID-19 pandemic (WAM,2020). The attendees agreed to keep climate protection at heart and rebuild the economy with a focus on climate-friendly investments such as renewable energy (WAM, 2020; Alfaham, 2020).

The climate change poses very real threats in the Arabian region. Modelling studies have suggested that extreme heat events could result in temperatures intolerable to humans (Pal and Eltahir, 2016), which would render important events such as the Hajj pilgrimage potentially dangerous for the millions of people who attend each year (Kang et al., 2019; Saeed et al., 2021). Climate change threats in the region also extend to food security (Spiess 2012), further aggravation of extreme water scarcity (DeNicola et al 2015), biodiversity loss and coastal erosion (Al-Maamary et al 2017).

3. Methodology

Q Methodology was chosen as the technique for compiling perceptions of the participants and analysing the discourses. The method helps to reduce researcher bias and opens the opportunity for the participants to consider the topic from different viewpoints without getting distracted by discussion of factual correctness (Brown & Perkins, 2019; Ramlo, 2015). The method was developed by the British psychologist William Stephenson in 1935 and has been applied to many disciplines field including psychology, political, medicine, education, economics, behavioral and health sciences (Cross, 2005; Graaf, 2005; Zabala et al., 2018).

In Q-methodology the participants are provided with a set of statements related to the topic, which is also called the Q-set. They are asked to rank or evaluate the statements according to their beliefs,

attitude and perspective, which are then tested on similarities and differences in their subjective opinion on the matter. The respondents are referred to as the P-set (Graaf, 2005). Factor Analysis is used to analyze the responses of the participants taking part in the survey. Even though, in the common use of factor analysis, also called R methodology, the variables are traits such as age or gender, in Q methodology the variables are the individuals. The Q Method is a systematic approach consisting of qualitative as well as quantitative measures. The development of statements, the selection of participants and the definition of the topic or issue are based on qualitative judgements of the researcher. In this study the statements reflect how people connect the pandemic with climate change as well as perceive the individual and governmental responsibility in climate change efforts post-pandemic.

A major advantage of Q methodology is that complex viewpoints on a single issue can be gathered using a relatively small sample (Lien et al., 2018). Application of the methodology has been much debated and concerns expressed about subjectivity and interpretation (Sneegas et al., 2021), but it is generally considered to provide an effective understanding of "the interlinkages in opinions between topics or patterns of perspectives" (Mukherjee et al., 2018).

Q methodology follows six steps. The first step is to decide on a sample, the P-set, which are the participants involved and who are the main focus in our research. The P-set sample size can be relatively small when it has been well-chosen to accurately the focus of the study and the respondents represent a coherent perspective due to their educational background, position or their viewpoint on an issue (Moree, 2017). Since the younger generation will be affected most by climate change impacts, the sample is composed of students with all participants having an environmental background, studying in universities all across the UAE.

The second step is to develop a Q-set, which is usually composed of 300 to 600 opinion statements related to the topic. The Q-set includes negative, positive and neutral statements as well as different perspectives in order to ensure that the participants views are being addressed. Our Q-set consisted of 321 statements, which were selected from primary and secondary sources relevant to the topic Primary sources were interviews with students from across UAE universities, who were contacted for virtual meetings where the topic was discussed; and secondary sources were statements derived from the literature (Coogan & Herrington, 2011; Ward, 2010, Sulistiawati & Linnan, 2020, Manzanedo & Manning, 2020). All statements were representative of the research topic and covered significant sub-issues related to the impact of COVID-19 on climate change, the governmental responsibility for climate efforts and the importance of implementing regulations post-pandemic.

Once the Q-sets are developed, the third step is to reduce the number of statements to a Q sample of 40 to 80 statements that adequately represent the topic being investigated (Brown, 1980; Graaf, 2005). In order to ensure that all interests of our participants are covered in the Q sample, we organized the Q sets into the 4x4 matrix developed by Dryzek and Berejikian (1993).

Table 1: 4x4 Matrix used to segregate the statements according to the Discourse Element and Type of Claim

Type of claim	Discourse element			
	Ontology	**Agency**	**Motivation**	**Relationship**
Definitive	**54**	**18**	**1**	**16**
Designative	**23**	**11**	**4**	**20**
Evaluative	**16**	**17**	**13**	**89**
Advocative	**13**	**16**	**5**	**5**

Dryzek and Berejikian (1993).

The statements were chosen so that each cell of the table is occupied. The distribution of our statements into the matrix is shown in Table 1. The matrix is comprised of two dimensions, which are the "discourse elements" and the "type of claim".
The elements of discourse and types of claim are defined as follows (Dryzek and Berejikian 1993):

1) Ontology: a set of entities such as interests, groups, nations, classes or individuals.
2) Agency: degree of agency assigned to entities such as governments, leaders or ministries.
3) Motivation: describes the motivation of actors, for instance self-interest, civic virtue, survival, and so on.
4) Relationship: reflects natural or unnatural political relationships mainly taken for granted such as hierarchies based on age, education, birth, gender, wealth, social class.

The Types of Claim are defined as followed:

1) Definitive: definitions i.e, the claims that give meaning to the term.
2) Designative: claims that are statements of fact.
3) Evaluative: claims which explain the worth of something that does or could exist.
4) Advocative: claims that are concerned that something should or should not exist.

An example of a statement that falls under advocating agency would be statement 37 in Table 2: 'We should motivate policymakers to prioritize long-term safety over short-term costs and

economic gain'. An example for defining ontology is statement 15: 'What we thought was "normal" before the pandemic was already a crisis and so returning to it cannot be an option.'. An example for a statement that is evaluating motivation is statement 41: 'Recent improvements to air quality could be lost to a haze of "revenge pollution" as industries returned to normal operations.' Furthermore, statement 46 is an example for designating relationship: 'Climate change will still be around and will not really be changed by this crisis.'. Our Q sample consists of 50 statements and includes at least three statements from each section of the 4x4 matrix.

In the fourth step we distributed the survey in English to the participants. The participants were asked to score each statement according to what level they agree or disagree on a nine-point scale from +4, mostly agree, to -4, mostly disagree, with 0 representing a neutral opinion to the statement. The survey was conducted over three weeks during June and July 2020. The participants ranked the statements without influence from the researcher, based solely on their own perception. The field research was conducted during the COVID-19 pandemic so to avoid personal contact the survey was sent out via communication portals (social media) such as WhatsApp, LinkedIn and E-mail to comply with social distancing as well as lockdown regulations. Furthermore, we could not interview the participants face-to-face and so could not ask them to clarify why they agreed or disagreed to a statement during the Q-sorts. We re-established virtual communication with the participants later to gather additional information on the reasons for the scoring.

The fifth step is the factor analysis in which similar sorts are grouped together according to their correlation with each other (Lien et al., 2018). We analyzed the results of the survey using the PQ Method software. The factor analysis extracts factors, which are significant enough to represent common responses and therefore, help to understand differences among groups. A factor is considered significant when its 'Eigenvalue' is greater than 1.0 and is significantly loaded on least two Q sorts (Watts and Stenner, 2005). A significant factor loading is calculated by using the following equation, $2.58(1\sqrt{N})$, at a significance level of $P<0.01$. In our study, we extracted four factors with a higher Eigenvalue than 1.0, and these were chosen to represent our Ideal Q sorts and describe the discourses (Takshe et al., 2010).

The final step is interpretation of the factors that have been extracted from the statistical analysis, which are compiled into discourses. The themes of the discourses are based on the content or idea of the significant statements describing each factor (Song, 2017). The significance of a statement depends on its confidence level. A statement is considered statistically significant at a confidence level of 99% ($P<0.0.1$) with a second threshold of 95% ($P<0.05$). In this study we extracted a total of four factors (labeled from A to D). The interpretation is further explained in the next section.

4. Results

Four discourses were chosen based on their Eigenvalue and significant factor loading of 0.365. If a statement was scored as zero by one factor and others did not strongly agree or disagree (-1 to 1), it indicates the statements are less importance and rather insignificant (statement 6). However, a neutral score might be valuable if one factor rates a statement 0, but other factors express a very strong opinion (statement 20). Furthermore, the factor analysis provided the consensus and distinguishing statements, which are used to identify differences as well as similarities among the factors (Graaf, 2005). Distinguishing statements are those that have been scored significantly

different to one factor compared to others. While one factor maybe strongly agreed to a statement, other factors might score it as a complete opposite (statement 45). Consensus statements are non-significant at $P<0.01$ and do not distinguish between any pair of factors. Therefore, in consensus statement, all factors scored the statement similarly. (Mukherjee et al.,2018).

Table 2: Q-Statements. Each statement was scored from +4 to -4. Represents the Ideas Factor Score.

Statement		A	B	C	D
1	The coronavirus crisis has shown that people accept major restrictions laid down in regulatory law if there is an acute threat.	0	1	1	-2
2	Climate change poses a far greater threat to humanity, but because the danger is not, immediate action continues to be deferred.	-1	3	-1	-1
3	Once we have seen how much work can be done from home, many businesses will be encouraging their employees to continue working remotely.	-1	1	-4	-3
4	Environmental considerations will be sacrificed in favor of rebuilding the economy quickly.	-2	2	4	0
5	After the present pandemic is over, society will want to forget about it as quickly as possible.	-3	2	-3	4
6	Tackling climate change requires an approach that rejects the divisive narrowness of "me, my interests, and my country first".	1	-1	0	-1
7	A global pandemic that is claiming people's lives certainly shouldn't be seen as a way of bringing about environmental change either.	-4	-3	-4	-3
8	We must look beyond the temptation of adopting strategies based on a return to the normal of the past and instead seek to understand how it should respond to the future climate change driven transformation of the global economy.	2	0	-3	2
9	Rebuilding our lives and economies after lockdown should represent an opportunity to accelerate sustainability transitions.	3	3	0	1
10	To deal with the current and future global crisis, it is crucial to consider the different impacts that will be felt across nations and socioeconomic groups, and to ensure that those most vulnerable and unempowered are properly protected from its consequences.	4	3	-2	4
11	Compliance with environmental standards and the adoption and implementation of adequate climate and environmental measures should not be seen in contradiction with the economic needs generated by the COVID-19 crisis.	1	0	-2	4
12	COVID-19 stimulus should address health, the economy and climate together.	4	0	0	2
13	Ensure responses to the pandemic do not worsen the climate crisis and environmental degradation.	0	4	-2	3
14	COVID-19 has illustrated the fragility of life, but the same understanding has yet to be applied to addressing climate change which is about the fragility of resources required to sustain human life.	3	0	-2	3
15	What we thought was "normal" before the pandemic was already a crisis and so returning to it cannot be an option.	2	0	-4	1
16	People are rethinking their environmental footprint.	-2	-2	2	-4
17	People will not accept similar constraints of everyday life for climate protection purposes in the coming years.	-2	4	-3	-2
18	COVID-19 hasn't shown that society can change, because it has been unplanned.	-3	-2	3	-1
19	The recovery phase from COVID19 will overlap with global efforts to deal with the evolving climate crisis.	-1	-4	3	2
20	The crisis offers some grounds for hope.	0	-3	-4	-3
21	We will once again just comfortably venture from our homes, the global economy will start humming and life will return to normal.	-2	-2	2	0
22	In a tale of two crises, it is about time we treated the climate crisis with as much urgency as Covid-19.	3	-2	-1	2

23	People's expectations of what governments can do in a crisis will be much higher.	0	1	2	-2
24	The world is committed to continued climate change regardless of any temporary fall in emissions due to the Coronavirus epidemic.	-2	-2	2	-1
25	We should not allow today's crisis to compromise the clean energy transition.	4	2	3	1
26	Instead of grappling with the coronavirus pandemic, the global community needs to shift their attention towards climate-related issues that directly impact our health.	-1	-4	0	-2
27	When choosing between alternatives, we should ask ourselves not only how to overcome the immediate threat, but also what kind of world we will inhabit once the storm passes.	3	3	4	0
28	The outbreak has shown that governments can take radical and urgent actions to tackle a clear and present danger.	1	-3	4	-3
29	Governments are going to continue with their "business as usual" model.	-3	1	1	0
30	Governments have valid reasons to temporarily relax the enforcement of some environmental rules as they scramble to contain the pandemic and salvage their economies.	-4	1	-1	-4
31	Emissions will rebound once mobility restrictions are lifted and economies recover, unless governments intervene.	2	4	2	2
32	Politicians will be tempted in various parts of the world to support industries that are saying, 'We need to get up and running, don't worry about sustainability or climate change.'	0	2	1	1
33	What leaders will call "necessity" after the pandemic could be the mother of environmental destruction.	-1	3	0	0
34	A crisis of this magnitude really helps illuminate which elected officials are capable of leading and which are not.	2	2	0	1
35	All Covid-19 recovery investments should go towards commerce that either helps reduce carbon emissions or promotes digital business.	0	-3	1	0
36	Science must explore how changes, such as remote working, video conferencing, e-commerce, and reduced air travel, can be made durable and contribute to low-carbon pathways even after the corona crisis.	4	-1	-3	4
37	We should motivate policymakers to prioritize long-term safety over short-term costs and economic gain.	3	-1	3	-1
38	States should refrain from unconditionally injecting vast amounts of public money to bail out fossil fuel energy companies and aviation companies, and thus entrenching fossil fuel dependency.	1	4	-2	-1
39	The cabin-fever of self-isolation encourages people to travel more when the option is there again.	0	2	2	3
40	Oil prices have already crashed in the face of low demand; this could be used as the chance to increase taxes on fossil fuels, which can be used for climate purposes.	0	0	-3	0
41	Recent improvements to air quality could be lost to a haze of "revenge pollution" as industries returned to normal operations.	1	-1	-2	0
42	More important than the short-run impact on emissions are the impacts on investment in clean technologies such as renewable energy.	2	-1	-1	1
43	Both the coronavirus pandemic and climate change damage were knowable and preventable.	-3	-4	-2	-2
44	Carbon taxes and green policies harm economic growth and jobs.	-4	-2	0	-4
45	Prioritizing climate policy will harm the ability of most people to improve their conditions, particularly after the terrible economic shock caused by the lockdowns.	-4	1	4	-4
46	Climate change will still be around and will not really be changed by this crisis.	-2	-1	3	3
47	When the pandemic eventually subsides, carbon and pollutant emissions "bounce back" so much that it will be as if this clear-skied interlude never happened.	-3	0	1	3
48	People view COVID-19 as much, if not more, an economic crisis as a public health crisis.	-1	-3	0	-2
49	Ensuring people have access to education, jobs and can provide for their families must be the top priorities but should not be done at the expense of the environment.	2	0	-1	2
50	The fight against climate change can succeed amid a global pandemic.	1	-4	1	-3

4.1. Areas of Consensus and Disagreement

Statements of consensus among the interviewees are as followed: 9, 12, 25, 27, 31, 32, 34 and 39. All participants share the same or similar opinion on a topic. All participants agree that the lockdown during the pandemic should be used to set focus on rebuilding our lives and the economy sustainably (9). When healthcare systems are strengthened during the COVID-19 pandemic and governments work on designing major economic recovery plans, the climate should be addressed equally in a COVID-19 stimulus plan. Health, economy and climate shouldn't be seen separately, but be addressed all together (12). The crisis should not stop us from accelerating sustainable growth and working towards a clean energy transition (25). Instead, we should keep in mind that the crisis will pass and the measures we chose to fight it will determine the world we will inhabit after. Therefore, COVID-19 measures should not only be aimed towards short-term success but consider its impacts on the long-term (27). Carbon emission have decreased significantly as a result of COVID-19 related movement restrictions and lock downs. The participants of the survey agree that without governmental actions, carbon emissions are likely to increase back up again once the crisis has passed (31) due to the high travel demand post home isolation (39). Leaders will want to get life and the economy back to normal by supporting industries, such as the fossil fuel industry, to get running again not matter the environmental damage (32). Furthermore, there is consensus among the interviewees that the COVID-19 pandemic proved us, which officials and rulers are capable of leading and which are not (34).

Statements that show disagreement among all discourses are statements 7 and 43. All four discourses strongly disagreed that a health threatening, global pandemic shouldn't be seen as a way of bringing attention to environmental efforts. A global pandemic such as the COVID-19 crisis provides a space to accelerate sustainable growth. An opportunity that should not be ignored but used to tackle climate change (7). Lastly, the participants do not feel the pandemic could have been preventable. Both the coronavirus pandemic and climate change damage were knowable and preventable (43).

Statement 28 is one of the most controversial statements. Whereas discourse B and D strongly disagreed (-3) that governments were able to handle the crisis effectively, discourse C strongly agreed (+4) that governments proved their ability to take actions and fight the pandemic successfully. Discourse A only mildly agreed (+1), indicating no significant opinion on that matter. Another controversial statement is statement 45. Discourses A and D strongly disagreed (-4) that the prioritization of climate policies will limit the ability of people to improve financially after the economic shock. However, Discourse C agrees to the statement (+4) and considers climate policies as a threat for people, who are trying to improve their conditions post pandemic. Discourse B mildly agrees (+1). When talking about governmental actions during the pandemic and the implementation of climate policies, the opinions significantly vary among the discourses

4.2 Discourse A: Learning Lessons about Climate Sustainability from Lockdown and Sustain them Post Pandemic

Discourse A explains 28 percent of the total variance. Its distinguishing statements are statements 12, 20, 39, 4, 47, 29 and 45. In this discourse people strongly disagree with statements 5, 18, 30, 7 and 44. Furthermore, statements, which are to be considered as important are the ones presenting consensus (10, 36, 25, 9, 37, 14 and 22).

The COVID-19 pandemic has shown humanity how fragile our life on earth is. If we don't start treating planet earth and its resources more sustainably, the next challenges will be more destructive than the current crisis (14). However, the knowledge we gained from the crisis needs to be applied post pandemic. Climate change is just as urgent as the COVID-19 crisis (22).

Discourse A points out the importance of promoting economic sustainability post-pandemic, instead of using it as an excuse to set back climate change efforts (30). In order to prevent the spread of the COVID-19 virus, governments implemented lockdowns, work from home as well as movement restrictions, which resulted in a decrease of greenhouse gas emission. It is our responsibility to encourage policymakers to focus on long-term safety not only for us and the economy, but in favor of climate change (37). Society can change (18), but we need science and governments to work together in order to explore and implement regulations that support economic sustainability (36 & 9).

Even though, the discourse agrees that the impacts of the crisis on the different socio-economic groups needs to be taken into consideration when making decisions (10), it strongly disagrees that climate policies will have major negative impacts on the people and the economy (45 & 44). Discourse A is very optimistic that the COVID-19 crisis won't be forgotten by the community (5) and other stakeholders (29), but instead be beneficial towards a more sustainable economy.

4.3 *Discourse B: Preventing a return to pre-pandemic norms via post Pandemic Climate Change Regulations*

9 percent of the total variance is explained by discourse B. The distinguishing statements in this discourse are 17, 31, 38, 2, 33, 35, 26, 19 and 50. The participants disagreed to statements 28, 48, 43 and 43. The statements presenting consensus are 13 and 9.

In contrast to discourse A, discourse B is very pessimistic about the ability to establish economic sustainability post pandemic. In theory, rebuilding the economy should accelerate sustainable transitions (9). The discourse agrees that decisions made during and after the crisis need to be made carefully. All responses should at no cost contribute to environmental degradation and worsen the climate crisis (13).

However, it is very unlikely that people will agree to following similar restrictions once the virus is confined and implement them as a part of their life (17), but rather the opposite. Once mobility restrictions are being lifted, emissions will increase and the economy goes back to how we know it. Governments need to intervene by implementing further post pandemic regulations in order to move forward sustainably (31). Nevertheless, governmental decisions and interventions could also cause the opposite and worsen the state we are in for once and for all (33).

Governments need to implement regulations that not only benefit the economy, but focus on achieving climate change efforts. One way to achieve climate change efforts is to avoid promoting fossil fuel industries once the crisis has passed. Meaning, that states should avoid financing and bailing out this industry (38). According to discourse B, we don't stand a chance in fighting climate change (50).

4.4 *Discourse C: Role & Responsibilities of Stakeholders to Maintain the Fight Against Climate Change: A Priority*

Discourse C explains 8 percent of the total variance. Distinguishing statements are 28, 45, 18, 19, 24, 16, 9, 13, 10, 36, 8, 40 and 15. Statements of consensus include 4, 27, 46 and 37 while statements of disagreement are comprised of 5, 17, 20, 3 and 7.

Governmental entities and the community need to cooperate in order to accelerate and sustain changes. The COVID-19 crisis has proven that governments are able to take actions and tackle the impacts efficiently (28). The decisions we make now will impact how the economy and our life will rebuild. We need to decide what world we want to create and inhabit after the pandemic before choosing alternatives (27). It's the responsibility of society to motivate and encourage governments to continue implementing such measures in favor of climate change, despite short-term costs (37).

It is likely that businesses won't do their part in supporting climate friendly changes and won't be encouraged in continuing regulations such as work from home policies (3). Discourse C indicates that people are afraid that climate policies will negatively impact and limit their ability to improve their living conditions post-pandemic (45). Therefore, it is likely that environmental efforts will be pushed into the background and rebuilding the economy into the center (4).

4.5 *Discourse D: Post Pandemic Challenges & Opportunities*

The variance explained by the last discourse, discourse D, is 6 percent. The statements 27, 23, 1, 28 and 45 are distinguishing statements. Statements with which the interviewees disagreed

upon in discourse D are 44, 30 and 16. Common agreement is presented in statements 11, 36, 10, 5, 39, 46, 14 and 47.

After the pandemic, we will be confronted with challenges that require good decision making by stakeholders. Lacking knowledge and motivation within society could accelerate the climate change process. Discourse D strongly agrees that once the virus is confined, with time people will forget about it (5). Ensuring emission stay down post pandemic will be a major challenge. If not managed correctly, emission will increase to how it was before or even worse (47). Additionally, it can be expected that people will start travelling again after weeks of self-isolation. With people trying to make up for their lost time, emissions caused by airplanes or cars could result in even more than before (39). This discourse strongly disagrees that people will become more environmentally concerned and rethink their environmental footprint (16).

The Covid-19 crisis doesn't give governments a justified reason to push back environmental regulations (30). Instead, the implementation of environmental standards and measures taken to generate economic needs, should work as one and not be seen as opposites (11). The crisis is an opportunity to explore new ideas and ways to promote sustainable growth (36). The knowledge gained during the crisis can and should be applied to tackle climate change impacts (14).

However, discourse D takes on a pessimistic approach concerning future climate change efforts and strongly agrees that "climate change will still be around will not really be changed by the crisis" (46).

5. Discussion

This study was conducted in order to gain an insight into the opinion of younger people in the UAE on actions taken for the COVID-19 crisis and comparing them to those needed to mitigate and adapt to climate change. An analysis of statements scored by the participants using Q Methodology provided four discourses (A, B, C, D). In all four discourses it there was a consensus that further actions need to be taken post-pandemic in order to combat climate change impacts. Figure 1 provides a visual overview of the answers given to all the 50 statements from which the discourses were derived.

Discourse A emphasizes the need for economic sustainability post-pandemic. In terms of preventive measures and its global impacts, climate change as well as the COVID-19 crisis show similar challenges and opportunities (Manzanedo, 2020). The pandemic resulted in a major health crisis on a global level, crossing local and national borders. Whole countries agreed on introducing lockdowns, movement restrictions and therefore, reduce economic activities. This showed that if communities and governments realize how fragile human life is, actions are being taken. However, human life does not only depend on effective governmental actions and good healthcare systems, but on the resources our planet provides us with. Discourse A agrees that what we learned from this crisis should be seen as a lesson and motivate us to apply all the knowledge we gained to further push for post-pandemic efforts in favor of climate change. The crisis should not be forgotten, but instead be used to promote sustainable growth; in line with this Discourse A strongly agrees that the COVID-19 stimulus should be used health, economy, and climate, not allowing the crisis to compromise the transition to clean energy (Figure 1). The pandemic caused whole industries to shut down, leading to reduced emissions of greenhouse gases. The environmental benefits were immediately felt worldwide (Helm, 2020; Myllyvirta, 2020; Lenzen et all, 2020; Plume, 2020). Industries should be stopped from continuing business as usual, but instead, prioritize the acceleration of clean energy and sustainability transitions. The actions taken to combat the virus present an opportunity for policymakers and scientists to find ways, which enable us to

rebuild the economy sustainably while ensuring equal impacts among nations and socioeconomic groups.

Discourse B suggests the implementation of post-pandemic regulations in order to avoid a set-back in climate change efforts. The regulations that have been introduced during the COVID-19 crisis, such as work from home, movement restrictions and lockdowns are creating a reduction in carbon emissions. Whereas Discourse B takes on a rather pessimistic approach on whether or not continuing regulations post-pandemic will be accepted by the people and emissions will go up again once the crisis has passed (as highlighted in Figure 1, this is the only discourse strongly agreeing with the statement that people will not accept similar constraints on their everyday life for climate protection), they strongly agree that post-pandemic regulations should be a centre of attention and be enforced permanently. If countries prioritize economic gains over climate change efforts, the environmental damage could be irreversible. The main difference between the COVID-19 crisis and climate change are the immediate impacts felt by the pandemic where-as climate change effects have been incremental over time and its impacts are different in different countries. Some countries, such as Australia (Johnston et al., 2020), are already heavily affected by the consequences of the changing climate, others, such as the Scandanavian countries are more resilient to the consequences (Chinowsky et al., 2011). Discourse B believes that this difference contributes to the poor decision making of leaders on mitigating climate change. However, focusing post-pandemic financial aid on the recovery of major fossil fuel industries could accelerate the climate change process. Continuing regulations that maintain the decrease in carbon emissions should be a top priority to government authorities in order to guarantee long-term safety instead of short-term economic benefits. Not taking this opportunity as a chance to introduce permanent regulations, could limit our ability to prevent further climate change impacts.

Discourse C focuses on the roles and responsibilities of stakeholders. This discourse highlights the importance of effective cooperation between governmental entities and the community in order to accelerate change. The COVID-19 crisis required governmental institutions and leaders to take actions as well as decision-making in a small time-frame. However, a situation of this magnitude does not only rely on authorities, but the support of the community. Businesses and individuals need to agree and adhere to stay at home policies, movement restrictions and wearing of PPE equipment. Because continuous restrictions might harm the recovery of businesses, such as fossil fuel industries, Discourse C suggests that environmental regulations in favor of climate change will be pushed into the background. As shown in Figure 1, Discourse C is the only one strongly agreeing that prioritizing climate policies will harm the ability of most people to improve their conditions. It's the responsibility of the public to reconsider what world they want to inherit post-pandemic and to motivate policy makers to adjust the system. Governmental entities should then take actions accordingly together with businesses to accept the restraints and develop policies that support the transition.

Finally, Discourse D describes the upcoming challenges and opportunities arising from the COVID-19 crisis. The answers associated with this discourse are significantly and positively correlated with those of Discourse A. Lack of knowledge and motivation among communities and stakeholders could accelerate the climate change process even further. Discourse D sees the COVID-19 crisis as an opportunity to adapt environmental regulations and climate actions as part of economic needs instead of a contradiction, however it seems unlikely that the pandemic will have positive impacts on climate change. Due to weeks spent in lockdown, people could be motivated to travel and carbon emissions will soon rise again. In this regard, Discourse D strongly agrees that after the present pandemic is over, society will want to forget

about it as quickly as possible (Figure 1). Gaining the motivation from the communities to push for and support climate change actions presents a major challenge. However, if we efficiently apply what we learned from the crisis as well as promote science to explore new ways of keeping climate friendly regulations going, the pandemic can be considered as an opportunity for significant improvement.

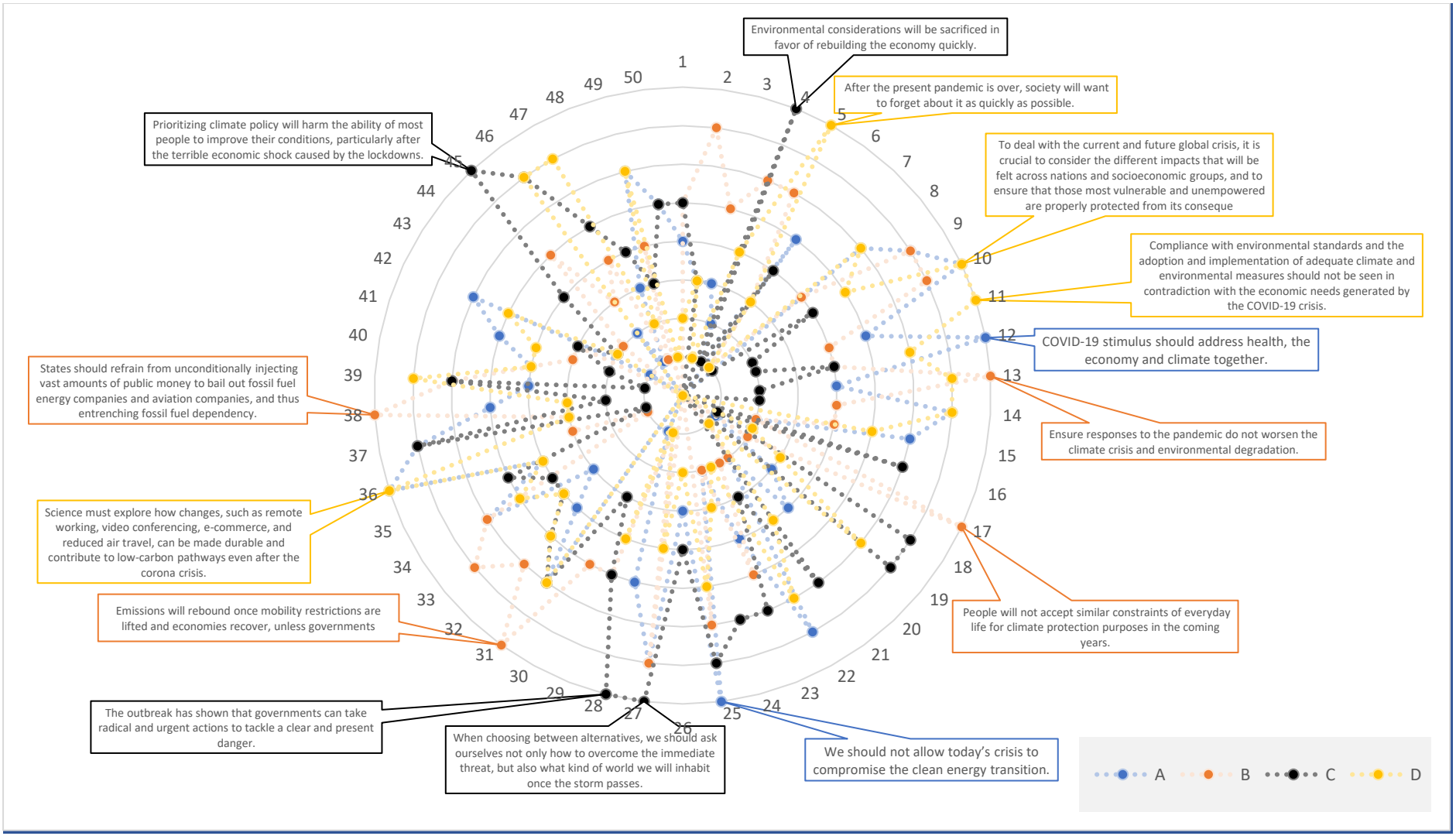

Figure 1: Visualization of discourses (text shown for level of agreement=4)

6. Recommendations

The majority of discourses have highlighted that governments need to prioritize climate efforts over economic gains. Not far in the future the consequences of climate change will threaten human life, and the COVID-19 crisis has shown how much the economy depends on the safety of its citizens. The government needs to find and implement new ways of rebuilding the economy sustainably. The European Green Deal is one example of promoting sustainable growth post-pandemic (European Commission, n.d.). Climate friendly guidelines and regulations are to be incorporated into COVID-19 recovery solutions. Strong governmental support and world-wide cooperation is crucial if we want to prevent an increase in emissions and avoid getting one step closer to destruction of our planet.

Change requires the support and commitment of the community. Lacking knowledge about the seriousness of climate change is a major contributor to motivating of people to take action. A major issue in this context is that the climate change is not yet perceived as an immediate threat by most people and decision makers. Therefore, they are not motivated to push for more climate friendly regulations post-pandemic. People need to be taught about how impacts might not be felt in their home country, but how it already affects and harms others. Furthermore, as the study also indicates that some people assume the fight against climate change is already lost, it is even more important to raise their awareness and make them understand that the COVID-19 crisis has given us an example of how change could be made.

7. Conclusion

The COVID-19 crisis has forced governments to implement major restrictions, industries to shut down and people to spend weeks in lockdown in order to control spread of the virus. The pandemic caused a significant drop in greenhouse gas emission due to changes in behaviour and limitation of travelling. In order to assess how the public perceives the relationship between COVID-19 and Climate Change, the application of Q methodology revealed four discourses on opinions of how life post-pandemic should proceed as well as the challenges and opportunities. Climate change is a major concern and effective implementation strategies are still lacking. Return to normal economic activity after the pandemic could significantly increase the carbon emissions. It is too early to project the impact of COVID-19 on future emissions and contribution to climate change in the UAE, but it is anticipated that emissions will decrease below the original projections for 2030. This decreased projection could be achieved actually if the government implements a ‘green’ economic recovery in parallel with more stringent climate policies, such as abolishing any carbon-intensive investments. The UAE has been active and forward-thinking regarding climatic actions and mitigation measures especially for a low carbon transition. Although mitigation measures require decisive government action, adaptation will be a shared responsibility between governments, communities, individuals.

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