Learning from climate change perceptions in southern African cities

Anna Steynor[a,*], Maximillian Leighton[b], Jessica Kavonic[c], Waarith Abrahams[a],
Lapologang Magole[d], Suzgo Kaunda[e], Chipo Plaxedes Mubaya[f]

[a] Climate System Analysis Group, Environmental and Geographical Science, University of Cape Town, P. Bag X3, Rondebosch, 7701 Cape Town, South Africa
[b] Department of Meteorology, Walker Institute, University of Reading, Reading RG6 6AR, United Kingdom
[c] ICLEI Local Governments for Sustainability, PO Box 5319, Tygervalley, 7536 Cape Town, South Africa
[d] Department of Architecture and Planning, Faculty of Engineering, University of Botswana, P. Bag 0061, Gaborone, Botswana
[e] Faculty of Engineering, University of Malawi-The Polytechnic, P. Bag 303, Blantyre 3, Malawi
[f] International Collaborations Office, Chinhoyi University of Technology, P. Bag 7724, Chinhoyi, Zimbabwe

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ABSTRACT

Scholarly understanding of an individual's climate change risk perception in the African context, is limited, including amongst those who have an influence on policy making. This discussion paper goes some way towards filling this gap in understanding by providing preliminary findings on concern and the psychological distance of climate change amongst policy influencers in three southern African cities (Blantyre, Harare and Gaborone). We posit that climate change is psychologically close amongst those consulted in each city and this is correlated with increased levels of concern. As psychological distance of climate change has been shown to be an indicator of willingness to act on climate change, we posit that willingness to act on climate change may be enhanced in these southern African cities and, indeed, in many African cities facing similar risks from climate change. This information should be used to nuance the way in which we engage in tackling the climate change challenge in urban Africa, recognising the potential receptiveness to act on climate change and the contextual need for concrete, solutions-based climate information.

1. Introduction

Climate change poses a major societal risk at present. This risk is particularly acute in Africa because the continent is projected to be disproportionately impacted by climate change (IPCC, 2014). However, despite the generally accepted societal risk posed from climate change, the perceived risk of climate change varies greatly from individual to individual, and particularly, from community to community.

Among the key elements of risk perception is the psychological distance of the risk (Spence et al., 2012), which is a measure of an individual's perception of proximity to something as either close and concrete or far and abstract (Pahl et al., 2014). It is defined by the amount of deviation in direct experience with respect to four dimensions, namely; temporal distance (time), spatial distance (geography and physical space), social distance (interpersonal distances such as those represented between two social groups) and hypotheticality (uncertainty as to whether an event will happen) (Liberman and Trope, 2008; Trope and Liberman, 2003; Trope and

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* Corresponding author.
  E-mail address: asteynor@csag.uct.ac.za (A. Steynor).

Liberman, 2011).

When an object or event is psychologically proximal, emotional and cognitive engagement typically increases (Lorenzoni et al., 2007; Spence and Pidgeon, 2010). For instance, in the context of a drought event, during which there are a finite number of days of drinking water supply left, perceptions associated with increasing drought events may be more concrete and motivate active preparation (such as in the case of the 2017 Cape Town drought and "day zero" scenario). When something is psychologically distant, people typically find it more difficult to relate to. For instance, the potential threat of future drought in the region. In these cases, people tend to focus on other priorities, which are thought of as more immediate and salient in the moment (Liberman and Trope, 2008).

The interactions between psychological distance, concern and willingness to act are well documented in the literature (e.g. Singh et al., 2017; Spence et al., 2012; Pasquini, 2019). When a risk is psychologically close, it is associated with a greater concern and willingness to act (Spence et al., 2012), so it would seem important to understand the psychological distance of climate change and concern when trying to encourage action on climate change. As urbanisation is a dominant and growing trend in Africa, it is particularly pertinent to understand these elements within the urban context.

The predominantly psychologically distant nature of climate change has been documented as one of the major barriers to action on climate change in the global north (Jones et al., 2017; Lorenzoni and Pidgeon, 2006; Mcdonald et al., 2015; Spence et al., 2012). However, apart from a preliminary study by Steynor and Pasquini (2019) there are few studies analysing the psychological distance of climate change in the African context, which may not exhibit a similar characteristic. In order to begin to fill this gap in the discourse, this paper uses preliminary findings to provide commentary about the psychological distance of climate change in an urban southern African context as well as explore its link to concern. Through the commentary, we posit that climate change is fairly psychologically close in urban southern African and this has implications for the way in which we should be engaging in the climate change challenge in urban Africa.

2. Informing the discussion

The commentary is informed by a study that included interactions with individuals in an institutional position to influence policy decision making in three southern African cities (Blantyre, Harare and Gaborone). Each of the cities face similar challenges with regards to climatic extremes, yet each is situated within their own unique socio-economic context. Blantyre is the commercial hub of Malawi with a population of approximately 1 million people, the majority of whom reside in informal settlements. Power for the city is supplied by hydropower stations located at the Shire River (less than 50 km from the city) and, at the time of the study, Blantyre was experiencing acute power shortages. Harare is the capitol city of Zimbabwe with a population of approximately 2 million people, again, the majority of whom reside in informal settlements. At the time of this study Zimbabwe was experiencing political instability, resulting in regime change mid-way through the study. Finally, Gaborone is the capitol of Botswana with a population of approximate ¼ of a million people. Gaborone differs slightly from the other two cities in that most of its residents live in formal housing and the capitol city is supported by a stable economy, however, two years previously it had experienced a drought resulting in the Gaborone dam running dry.

To inform the study, surveys, workshops and interviews were undertaken in each city in early 2018, spearheaded by an in-country academic, based at the local university. These consultations included individuals considered as 'policy influencers' (not policy makers) such as the city council departments and service units, national government departments, non-governmental organisations, utility services, resident associations and national meteorological services. Participants were selected based on a cross-section of individuals and organisations with an influence in policy decision making in each city. The focal point city representative provided advice in this regard.

A total of 40 participants completed a standard survey assessing the psychological distance of climate change and concern. This was made up of 15 respondents in Blantyre, 14 in Gaborone and 11 in Harare (see appendix for the demographics of the sample group). In the cities of Blantyre and Gaborone, participatory workshops, involving the same participants from the survey, then allowed for further exploration of the perceptions identified through the survey component.

One question for each theoretical dimension (hypothetical, spatial, social and temporal) of psychological distance was included in the survey (see appendix for survey questions) with the addition of two questions relating to concern about climate change. These questions assessed concern about climate change at the city scale and concern about climate change on a personal level.

The results of the survey are presented here to inform discussion on the psychological distance of climate change, and related concern, amongst policy influencers in each of the three cities. Results are delineated for each city (in order to compare and contrast the results between cities) and are also presented as totals across the entire group of respondents from all the cities. Whilst these results are only intended to inform a commentary, we acknowledge that there are a number of limitations. Most notably is the small sample size, consisting of a narrow social demographic and a strong male bias.

3. Informing dimensions of psychological distance of climate change and concern

In order to inform the commentary, the findings from each dimension of psychological distance are provided here in Figs. 1–4 and then discussed, in turn. These are followed by findings pertaining to the respondent's level of concern about climate change (Figs. 5 and 6).

The *hypothetical distance* of psychological distance (Fig. 1), relates to the perceived certainty of an occurrence/event. In the climate change context, this dimension is somewhat complex because it may include either perceptions about whether climate

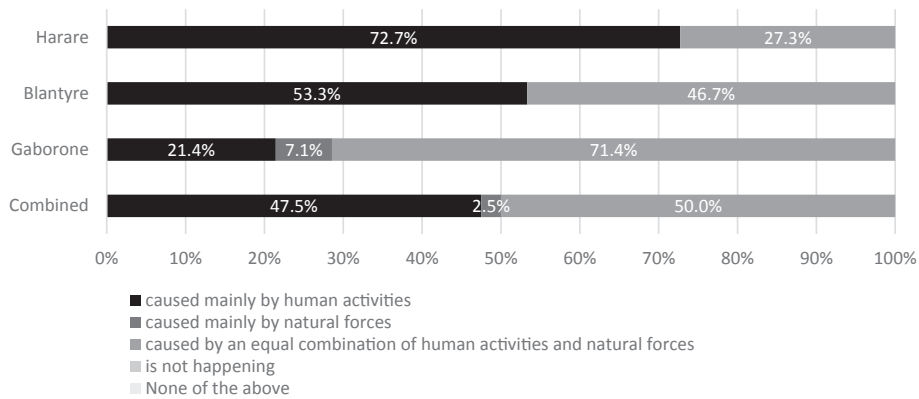## Which of the following statements regarding climate change (global warming) do you personally believe?

Fig. 1. Assessed hypothetical distance of climate change.

When, if at all, do you think your city will start feeling the effects of climate change?
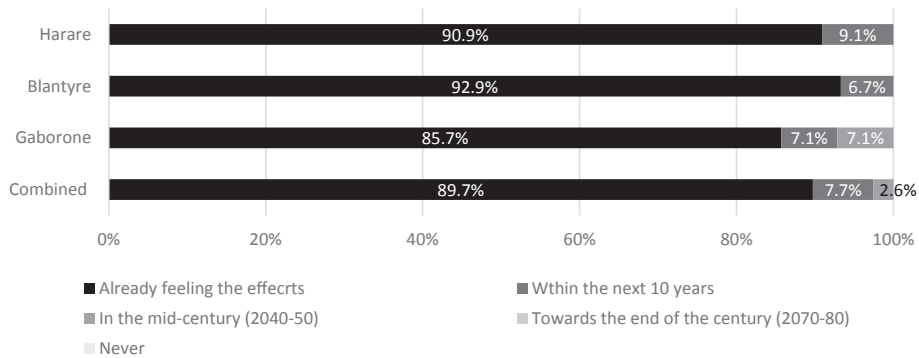

Fig. 2. Assessed temporal distance of climate change.

How much of a threat do you think climate change is to your city?
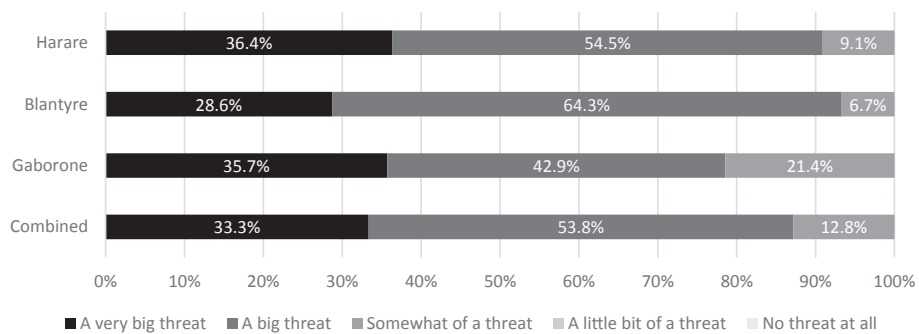
Fig. 3. Assessed spatial distance of climate change.

change is both a real and certain threat (relating to climate change scepticism) or perceptions regarding the uncertainty of the magnitude of change (Mcdonald et al., 2015; Wakslak and Trope, 2009; Poortinga et al., 2011). To inform this dimension, we employed a common definition of hypothetical distance used in previous studies (e.g. Spence et al., 2012; Leiserowitz et al., 2010; Mcdonald et al., 2015), which is simply the uncertainty of whether climate change is happening or not, be it by human or natural

How much of a threat do you think climate change is to you personally?

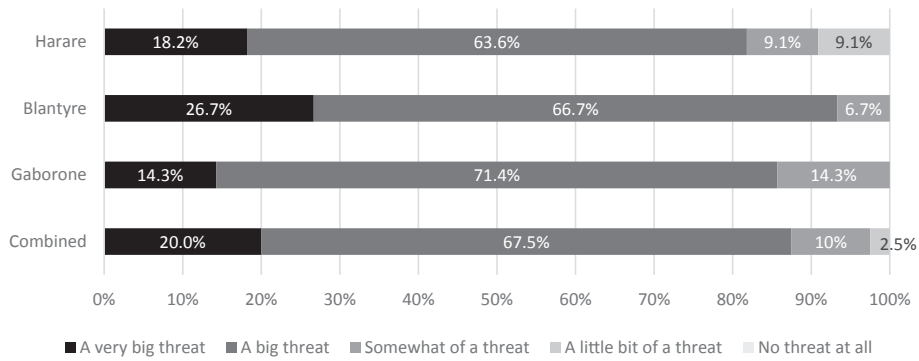|	A very big threat	A big threat	Somewhat of a threat	A little bit of a threat	No threat at all
Harare	18.2%	63.6%	9.1%	9.1%	
Blantyre	26.7%	66.7%	6.7%		
Gaborone	14.3%	71.4%	14.3%		
Combined	20.0%	67.5%	10%	2.5%	

Fig. 4. Assessed social distance of climate change.

Are you concerned about the impacts of climate change to your city?

	I'm extremely concerned	I'm very concerned	I'm somewhat concerned	I'm a little bit concerned	I'm not at all concerned
Harare	36.4%	63.6%			
Blantyre	40.0%	60.0%			
Gaborone	15.4%	61.5%	15.4%	7.7%	
Combined	30.8%	61.5%	5.1%	2.6%	

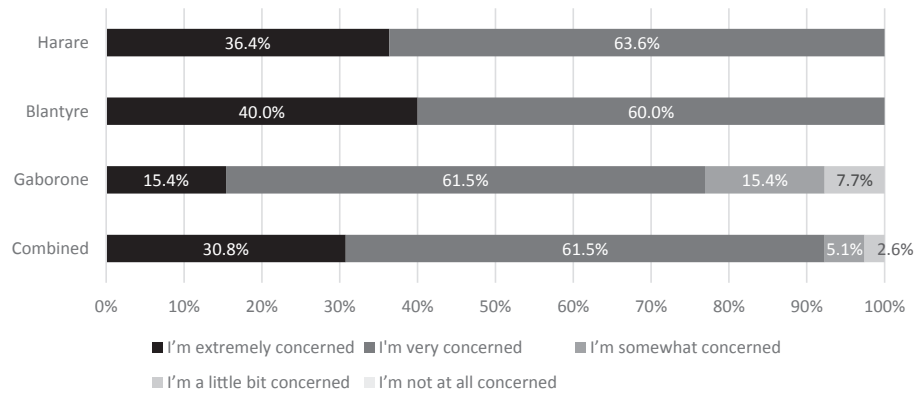**Fig. 5.** Concern about climate change at a city scale.

Are you concerned about the impacts of climate change to you personally?

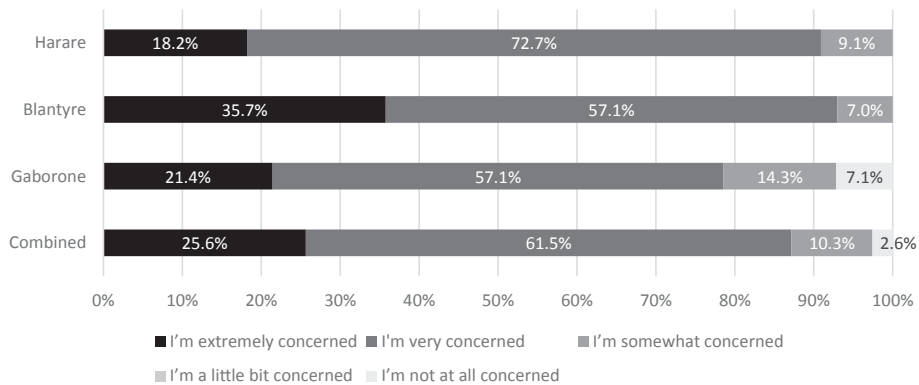|	I'm extremely concerned	I'm very concerned	I'm somewhat concerned	I'm a little bit concerned	I'm not at all concerned
Harare	18.2%	72.7%	9.1%		
Blantyre	35.7%	57.1%	7.0%		
Gaborone	21.4%	57.1%	14.3%	7.1%	
Combined	25.6%	61.5%	10.3%	2.6%	

Fig. 6. Concern about climate change on a personal level.

forces. Perceptions of uncertainty regarding the magnitude of changes are somewhat informed by the questions regarding the magnitude of perceived threat (Figs. 3 and 4).

All the participants in the study believed that climate change is happening, whether it be due to human forces (47.5%), natural forces (2.5%), or a combination of both (50%). During the ensuing workshop discussions, it emerged that many respondents were influenced by the word 'equal' in the phrase 'equal combination of human activities and natural forces'. One participant in Blantyre noted that "it is the word equal that has left us confused. It is not equal". Consequently, many respondents were swayed towards the more binary options of 'mainly by human activities' or 'mainly by natural forces'. Therefore, while it is clear that all respondents felt that climate change is a certainty, the results regarding the perception of the driver of change may not be reliable. For the purposes of assessing psychological distance, however, the driver of climate change is of little significance, because the perception that the climate is certainly changing is what influences psychological distance.

The participants who felt that climate change is caused mainly by 'natural forces' referred to past temperatures as a justification of their decision, whilst those that chose the 'combination of human activities and natural forces' option used the same justification. The latter, however, typically went on to suggest that the current social structures in these respective cities have not yet experienced the previous extreme high temperature periods, nor has the rate of change occurred as rapidly.

While these preliminary findings are useful in ascertaining whether climate change is considered as a 'real' threat, it provides little information as to the *degree* of certainty of the participants perceptions. The level of confidence with which the participants spoke about climate change in the ensuing discussion provided some insight into this. Most of the participants were confident when speaking about climate change and its impacts while only a few were more hesitant in their responses. The facilitator of both the Blantyre and Gaborone workshops documented this by noting that "participants are familiar with climate change concepts and are very willing to share insights and knowledge".

Arguably, the most striking results were obtained from the question pertaining to the *temporal distance* of climate change (Fig. 2). The majority of respondents across all the cities believed that climate change is already impacting their city (89.7%), while 7.7% of the respondents felt that their city would start feeling the effects of climate change within the next 10 years. The ensuing discussion elucidated the potential underlying reasons for these perceptions, which aligned closely to the fact that many participants themselves had been directly affected by climate extremes. In Gaborone the respondents relayed stories of unusual rainfall events having occurred, causing flooding challenges in many areas such as the Kopong area, where many of the city workers live. One of the Gaborone respondents further highlighted the recent need to change disease control management measures as evidence for the effect of climate change. In Blantyre, predominant stories of observed climate change related to droughts, floods and high winds. The most recent story mentioned, with sadness among the participants, was that of the 2014/15 floods in Blantyre, which resulted in the loss of human lives and destroyed city infrastructure.

To assess the *spatial distance* of climate change, participants were asked how much of a threat they perceive climate change to be in their city. The objective of this question was to ascertain whether they perceive climate change to be a threat to their immediate local area (Fig. 3). Again, the majority of respondents (87.1%) felt that climate change poses either a 'very big' or 'big' threat to their city stating (in Blantyre) that "high unpredictability in weather changes and the city planners not very much investing and/or using climate data to plan and develop a climate resilient Blantyre City, the threat to climate change is very big to the city". However, a small number (12.8%) of the respondents considered climate change to pose only somewhat of a threat. These answers were explored through discussion and it became apparent that, many of the respondents that chose 'somewhat of a threat' thought that "through correct management practices and appropriate infrastructure provisions", climate change impacts could be addressed, and thus the threat could be reduced somewhat because "the threat is based on what we are doing now". However, the majority of participants believed that "infrastructure is not ready and [the city] do[es] not [yet] have [adequate] standards to deal with the complexity of climate change".

When asked the same question with regards to climate change threat on a personal level *(social distance)*, the majority of respondents (87.5%) felt that climate change poses a 'very big' or 'big' threat to them personally (Fig. 4). One Gaborone participant stated, "the trends tend to be for my city but the effects are personal". This was corroborated by other participants from Gaborone, who stated that their sense of personal risk from climate change was directly influenced by the location of their place of residence, stating that it "matters where you stay". It is typical for residents of Gaborone to travel far distances from the neighbouring areas, where they have subsistence farms or travel along roads that are already inundated with water during the wetter season. A participant in Blantyre explained how much it had cost him to rebuild his house after damage to his property from recent strong winds, whilst another participant mentioned how water shortages forced him to use unclean water sources and "problems of crop failure due to increased incidences of drying of crops in our gardens" made him think that climate change is a big threat to him personally.

While the discussion suggested a comparatively higher perception of personal risk when compared to the threat at the city scale, the empirical results actually show that a lower percentage of respondents felt that climate change poses a 'very big' threat to them personally (20%) when compared to a 'very big' threat at the city scale (33.3%). These preliminary findings correspond with findings from other studies which note that climate change is generally seen as a greater threat to society than to one personally (Zwick and Renn, 2002; Lorenzoni, 2003; Leiserowitz, 2005; Spence and Pidgeon, 2010).

As stated earlier, psychological distance of climate change and concern have been correlated in previous studies (e.g. Spence et al., 2012). To assess this correlation in the African city context, the respondents answered two questions related to concern. One question pertained to their concern about climate change at the city scale and the other to concern about climate change to them personally (Figs. 5 and 6).

Showing correlations (although not statistically verified) to the dimensions of psychological distance, concern across all three of the cities was high with 92.3% of the respondents either 'extremely' or 'very' concerned about climate change at the city scale and

87.1% of the respondents either 'extremely' or 'very' concerned about climate change on a personal level.

4. Exploring the link between psychological distance, concern and willingness to act in the southern African urban context

The preliminary results presented here suggest that, amongst those consulted in each city, climate change is perceived to be proximal (close) along each of the dimensions of psychological distance, with temporal distance showing a particularly marked emphasis (Fig. 2). This is correlated to a similarly high level of concern for climate change across each of the cities. These preliminary findings are particularly thought-provoking because policy influencers may be viewed as occupying a position of power in society, by virtue of their influence on governmental decision-making. Based on Trope and LIberman (2011)'s proposal, people in positions of social power should perceive themselves as more distant from risks than those who have less social power. Yet this is not the case in these cities, hence, the psychologically proximal nature of climate change amongst this audience is noteworthy.

In addition, the psychological proximity of climate change amongst the policy decision influencers in each of these three cities seems to contrast with general findings on the psychological distance of climate change in the global north (Jones et al., 2017; Spence et al., 2012; Lorenzoni and Pidgeon, 2006; Mcdonald et al., 2015). Although studies from the global north predominantly sample a general public audience, climate change is generally more psychologically distant and is seen as a lower cause for concern in the global north, in comparison to the respondents from the southern African cities in this study. The workshop discussions highlight a possible explanation as to why this may be the case. While it is not possible to directly experience climate change (van Aalst, 2006), it is possible to experience the perceived manifestations of climate change through the experience of extreme climate events (Pasquini, 2019). If these extreme climate events are believed to be caused by climate change then they will affect people's climate change risk perceptions (Krosnick et al., 2006; Brody et al., 2008; Akerlof et al., 2013). Through the workshop discussions, it was made clear that each city routinely experiences extreme climate events. The respondents explicitly linked these events to climate change. For instance, stories that related to droughts, flooding and high winds were given as examples as observable effects of climate change. It is likely that these experiences of extreme climate events have heightened the awareness of climate change as a real, imminent and personal threat which has influenced the psychological distance of the risk.

Previous studies have drawn linkages between the psychological proximity of a risk and the willingness to act on the risk, both through mitigation actions (Okaka and Odhiambo, 2018; Spence et al., 2012) and adaptation actions and policy (Okaka and Odhiambo, 2018; Singh et al., 2017). Drawing on this premise, the respondents involved in this study would likely have an enhanced willingness to act. This postulation is corroborated by respondents making statements such as "There will be increased climate related diseases if no or little action is taken" and "It's a matter of the interventions – they can reduce the impacts". Indeed, this willingness for action may be the case in many African cities where similar extreme climatic events are experienced on a regular basis. This aligns with our general experience of working in African cities where climate change is rapidly being viewed as an urgent threat requiring streamlining into policy and action.

Psychological proximity also influences the way in which a risk is construed (Trope and Liberman, 2011), for instance, a proximal risk is construed in a concrete framing as opposed to in an abstract way. This influences the type of information people use to make decisions on the risk. In situations of psychological closeness people may require concrete, solutions-driven information in order to make context specific decisions (Steynor and Pasquini, 2019; Brügger et al., 2016). For instance, the increasing risk of water shortages in each city requires information regarding the periodicity and length of dry spells in the near to medium future alongside impacts and adaptation options, including cost-benefit analyses. This provides decision makers with concrete information that is required to make imminent decisions on climate variability and change.

5. What does this mean for how we engage with climate change in urban African?

African cities are often strongly connected to the surrounding rural and agricultural areas. These connections mean that cities are often significant engines for change in their local region. Therefore, cities provide fundamental opportunities for wide-reaching change if climate information can be better integrated into decision making. It is important to utilise the enhanced understanding elucidated through this preliminary data in order to better inform how we engage in climate change in urban Africa.

Firstly, the postulation of psychological proximity of climate change within these southern African cities (Blantyre, Harare and Gaborone) has implications for the way in which we should be engaging. The preliminary results from this study imply that climate change is viewed as a real and imminent risk in each of these southern African cities. This likely enhances the appetite for action and increases receptivity to climate change interventions. It is unlikely that these findings are constrained to the specific southern Africa cities in this study because many African cities face similar challenges, particularly with regards to developmental contexts and impacts from extreme climate events. Indeed, Asiyanbi (2015) documented similarly high levels of climate change concern in Lagos, Nigeria. Hence, now is the time to resource African cities to implement action on climate change. It is more important than ever to work with city decision makers to understand the contextual needs for climate information in African cities and seize the opportunity to build on the appetite for action on climate change.

Secondly, drawing on theories relating to how risks are construed (Trope and Liberman, 2011), we should be changing the way in which climate information is presented. In situations of psychological closeness, we should be providing concrete, solutions-based information on a short to medium term time scale in order to inform policy-relevant decisions. This reinforces the call for enhanced inter and transdisciplinary collaborations in order to work together in creating holistic climate services products that are context-specific and meet the nuanced needs of decision makers (Vogel et al., 2019; Jones et al., 2015).

While the nature of this study is preliminary, it highlights the need for further understanding of African perceptions of climate

change. This differentiated understanding of climate change perceptions in urban Africa would allow for a deconstruction of the homogenous view on climate risk management.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix

Questions Assessing Individual dimensions of psychological distance and Concern

Construct	Question	Response Options
Hypothetical Distance	"Which of the following statements regarding climate change do you personally believe?"	5-Choices Climate change (global warming) is happening, caused mainly by human activities Climate change (global warming) is happening, caused mainly by natural forces Climate change (global warming) is happening, caused by an equal combination of human activities and natural forces Climate change (global warming) is not happening None of the above
Temporal Distance	"When, if at all, do you think your city will start feeling the effects of climate change?"	5-point scale (Already feeling the effects – Never)
Spatial Distance	"How much of a threat do you think climate change is to your city?"	5-point scale (A very big threat – No threat at all)
Social Distance	"How much of a threat do you think climate change is to you personally?"	5-point scale (A very big threat – No threat at all)
Concern About Climate Change	City Scale: "Are you concerned about the impacts of climate change to your city?"	5-point scale (I'm extremely concerned – I'm not at all concerned)
	Personally: "Are you concerned about the impacts of climate change to you personally?"	5-point scale (I'm extremely concerned – I'm not at all concerned)

Demographics of sample group completing the survey, per city

Harare (N = 11)		Blantyre (N = 15)		Gaborone (N = 14)	
Gender		**Gender**		**Gender**	
Male	10	Male	15	Male	11
Female	1	Female	0	Female	3
Highest education		**Highest education**		**Highest education**	
School	0	School	1	School	0
Diploma	2	Diploma	2	Diploma	0
Bachelors degree	6	Bachelors degree	6	Bachelors degree	10
Masters degree	3	Masters degree	4	Masters degree	4
Doctoral degree	0	Doctoral degree	2	Doctoral degree	0

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