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Gendered dimensions of climate change response in Swedish municipalities

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This article elaborates on and discusses gendered dimensions of climate change response in Swedish municipalities. There are indications that attitudes and behaviour to the environment and climate change are gendered. This evidence together with our own work further indicates that gender awareness is most probably an important influence on how municipalities respond to climate change. The aim of this study was to investigate if and how gendered aspects of climate change response are integrated in the Swedish response to climate change. The potential causal relationships between a high level of awareness of the gendered aspects of climate change and the levels of climate change response were investigated. We asked whether there is a positive relationship between gender awareness and the quality of the communities' climate change policies and practice. Indications of such a relationship prompt a change in research priorities – paying more attention to gender – and in subsequent policy developments.

Keywords: gender; power; environment; climate change; spatial planning; Swedish municipalities

Introduction

There is a substantial body of evidence that suggests gender-dependent differences in citizens' attitudes and behaviour in relation to environment as understood from an ecological point of view. This is expressed both as, for instance, differences in consumption patterns, regarding transportation, consumer goods and energy, and as gendered power and coping patterns resulting in gendered differences in greenhouse gas emissions. Although global warming and climate change response have become high priorities on the Swedish agenda (cf. Sweden 2007, p. 60, 2008, p. 24, 2008/2009, p. 162), research that enquires into the gendered dimensions of climate change response at the municipal level remains scarce. Filling this gap is crucial, given the planning monopoly and responsibility for spatial planning that Swedish municipalities represent. Research on gendered dimensions of climate change is needed and urgent if we are to meet the needs of the future, both in terms of mitigation and adaptation (Lundberg 2008). When it comes to mitigation, for example, women are generally more open to changing their way of living compared to men, who more often tend to believe in technological solutions (Lundberg 2008).

Given this situation, we set out to investigate the gendered dimensions of climate change response at the municipal level. The objective of this article is to map differences between Swedish municipalities in their climate change response, and to discuss those in

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relation to gendered dimensions of attitudes and behaviour towards the environment. More specifically, we investigate the potential for causal relationships in Swedish municipalities between a high level of awareness of the gendered aspects of climate change and the general levels of climate change response.

Gender, environment and climate change

Literature that focuses explicitly on gender and climate change is scarce. There are, however, several studies that highlight gender, everyday life patterns, attitudes and behaviour in relation to environment. There are also some studies that highlight the gendered nature of energy and transport consumption and indirectly involve a climate change perspective. We draw on these studies below when discussing gender awareness and municipal response to climate change.

We use the term "gender" to refer to something produced by women's and men's different experiences of everyday life, as they arise due to gendered power regimes and the traditional division of labour, for instance, between reproductive and productive activities (Nilsson 2008).

In discussions with informants, we used the Swedish word, "genus", a word carrying a meaning slightly different from the English "gender". The concept of genus is generally, but not always, perceived as non-, or at least less-, associated with the binaries "men" and "women"; compared to the notion of gender, it is more associated with social constructs. This should not, however, deter a reader who might have a view of men and women as being a universal behavioural binary set, since much of the present discussion and results are in most ways also compatible with that view.

With respect to everyday life patterns, several Swedish studies show that women's and men's travel patterns, and their use of the automobile, are different (Polk 1998, 2003, Carlsson-Kanyama *et al.* 1999, Krantz 2000, Transek 2006a, 2006b, Johnson-Latham 2007, Sandow 2008). Johnson-Latham (2007) emphasises that men in Sweden drive cars more than women and thereby contribute more to emissions of CO_2. Also, in studies related to energy use, gender awareness is shown to be relevant to some extent. Carlsson-Kanyama and Räty (2008) show, for instance, that women and men in single households use energy in different ways, implying that policy to reduce the use of energy should be gender-sensitive.

Going beyond the actual patterns of everyday life, Norgaard and York (2005) argue that several studies from environmental sociology, social psychology and political science, such as Bord and O'Connor (1997) and Davidsson and Freudenberg (1996), find gender differences when it comes to concern, values and perceptions of environment. Bord and O'Connor (1997) argue that the forces behind these differences are "differences in perceived vulnerability to risks from the environment, not necessarily differences in ecological sensibilities" (p. 830). Davidsson and Freudenberg (1996) report that there are clear-cut differences between women and men when it comes to environmental and technological risks: "In the case of facilities with the potential to create local hazards, whether nuclear or otherwise, women have again been found consistently to have significantly higher levels of concern, on average, than men" (p. 327). Furthermore, Kathlene (1989) argues that: "A fundamental assumption underlying psychological studies of gender is that all life's experiences mould a person's perspective of the world" (Kathlene 1989, p. 399).

In that respect, several Swedish and international studies confirm that women are more concerned with environmental risk issues (Zelezny *et al.* 2000) and that social roles may be an explanation for gender differences in environmental concern. Highlighting

transportation, once more from a Swedish perspective, Polk (2003) argues that women's and men's attitudes to car use are different. She argues that women not only use transportation modes that are more environmental friendly, but also express greater concern for the environmental impacts of car use and show a greater acceptance of a reduction in car use. She also emphasises that women, to a larger extent than men, are generally concerned with the environment, not only at the local level, but also at regional and global levels. Polk (2003) also highlights that her findings correlate well with other attitude surveys in Sweden, such as Bennulf (1994). With respect to use of energy, Carlsson-Kanyama and Räty (2008) argue that women are more likely to buy goods from companies that work to reduce their climate change impact. Dietz *et al.* (2002) point out that when it comes to environmentalism, there is a difference between women and men with regard to one particular value, that of altruism. In their study, women reported a substantially higher priority for this value than men. "So it may be that the gender differences in environmentalism observed in the literature can be attributed, at least in part, to gender differences in altruism resulting from differential socialization and life experiences" (Dietz *et al.* 2002, p. 361).

Several international studies argue, on the other hand, that gender differences are mostly visible when it comes to environmental risk concern related to the private sphere of life, such as recycling activities and cutting back on driving (Tindall *et al*. 2003, Hunter *et al*. 2004). The evidence does not seem as strong when it comes to expressions of public environmental concern, such as time spent in volunteer work, and in attending public meetings (Hunter *et al*. 2004). The study by Hunter *et al.* (2004) was performed cross-culturally and shows in a significant way that women engage in more environmentally friendly behaviours, whereas there is no evidence that women are more engaged as activists on a public level. This corresponds well with O'Connor *et al.* (1999), who argue that:

> Women are more likely to intend to take voluntary actions. For voting intentions, however . . . it is better educated, older, men who are more willing to support government policies . . . in order to reduce greenhouse gas emissions. (p. 469)

In summary, the authors find women to be overrepresented among supporters of voluntary action and the more educated over-represented among supporters of government policies. The authors argue that one explanation could be the tendency for men to feel more comfortable with the political world, whereas women prefer private action (O'Connor *et al.* 1999, pp. 468–469). Men and women, apparently, can have somewhat different approaches to actions related to the environment and climate change, which emphasises the importance of incorporating both women and men in formal decision-making processes.

Nevertheless, there are many studies that demonstrate that gender and gender awareness actually are relevant when it comes to public perceptions of environmental risk and climate change concern. In Sweden, this has been shown in a study of women's and men's concerns regarding environmental and climate change issues on a more public level. The study shows that Local Agenda 21 programmes in Sweden have to a great extent been driven by well-educated women. Yet, these women have had very little power in the organisations they are active in. Furthermore, the relation between women's parliamentary positions and the degree of environmentalism is clear (Norgaard and York 2005). Another interesting study, Villagrasa's (2002) research on the UN negotiations on climate change and on the Kyoto Protocol, shows that gendered structures are relevant and important. Villagrasa (2002) argues that, "women were able to play a strong and generally positive role for climate protection based on their networking and interpersonal skills, and their ability to think and plan for the long term, even though they were generally underrepresented . . . " (p. 41). Of the different sectors

represented at the negotiations, the environmental NGOs were the most united. The majority of the female participants were part of this group and it was women who made sure that NGOs worked together despite disagreements (Villagrasa 2002).

When attempting to investigate the complex gendered attitude and behaviour patterns in relation to environment and environmental risks, recent research (Henwood *et al.* 2008), suggests that further research has to move from studying gender differences, which tends to become essentialist, to studying effects created by gender. The latter approach recognises the social influence of gender and the powerful ways in which it can operate. Henwood *et al.* (2008), furthermore, draw parallels to the literature on the so-called "white male effect" (see Flynn *et al.* 1994, Marshall 2004, Satterfield *et al.* 2004). The white male effect draws on research showing that white males have a relatively low perception of risk, due to their being part of a generally privileged group in terms of economics, resources, sense of control, worldviews and so on. On the contrary, inequality leads to a higher perception of risk among women's and minority groups (Olofsson and Rashid 2011). Interestingly, Olofsson and Rashid's (2011) empirical studies show that:

> The chief finding is that there is no WME in Sweden, which we concluded results from the relative equality between the sexes in the country. On the other hand, ethnicity serves as a marker of inequality and discrimination in Sweden. Consequently, ethnicity, in terms of foreign background, mediates inequality, resulting in high risk perception. (p. 1)

In concluding this section, it can be stated that there is a tendency to consider that gender has an impact on behaviour, attitudes and concern in environmental risk and climate change issues. What has also been highlighted is the problem of, on the one hand, essentialising gender differences, and thereby reinforcing dualistic thinking about women and men and, on the other hand, arguing that gender differences should be understood in a wider social context. The latter acknowledges that women and men in today's society have different responsibilities for productive and reproductive activities and that the level of equality in a country, or region, is relevant to how gender is seen as relating to behaviour, attitudes and concern, in environmental risk and climate change issues.

Material and method

This article is based on two telephone surveys, performed in 2007 and 2008 (Langlais *et al.* 2007), that enquired into the quality and extent of the responses to climate change that were being made by all 290 of Sweden's municipalities. The main goal of the surveys was to discover which Swedish municipalities were implementing *concrete actions* with regard to climate change issues. The emphasis was to gather data about what the municipalities' representatives themselves considered to be their concrete actions, as well as whether climate change work was being mainstreamed in the municipal organisations. In 2008, a gender dimension was added to the survey. Although the data collected were not exhaustive, it was nevertheless highly qualitative and resulted in a 100% response rate for both years.

In the 2007 edition, the interviewers telephoned each municipality's general telephone number, and asked whoever answered if it would be possible to speak to the person in the administration who was responsible for questions regarding climate change. In other words, the choice of respondent was made by the person whom we first spoke to. It was left to their discretion to decide who would be most suitable for speaking with us. In a sense, this was a method whereby the municipality's administration *self-selected* the most suitable respondent. When we were able to speak with the first respondent for the administration, and

often only after several unsuccessful calls, we in turn asked if they were the right person to talk to, or whether they would prefer to suggest another informant instead. In many cases, it took more than three such rounds before the ensuing respondent was someone who deemed him- or herself as being suitable for answering our questions. The respondents were most often the municipality's heads of environmental or planning departments; environmental or climate change experts; strategic planners; planning architects; and energy and climate change advisors. By phoning the switchboard and then being connected to several persons, the interviewer obtained a useful first impression of the extent to which climate change work was being mainstreamed in the municipal organisation. These different steps were noted in the interview journal template. The informants were asked three main questions (authors' translation from the Swedish):

(1) Is your municipality engaged in any concrete measures (and what are they?) related to the climate change issue?
(2) What goals (and the reasons for them) does the municipality have with regard to its climate-related work?
(3) Who started this work and when?

Those three questions formed the basis for what often became extensive in-depth and free-ranging exploratory interviews.

All municipalities were categorised based on an aggregated view of the questions and a structured interpretation of the essentially qualitative material from the interviews. That resulted in a six-level compound Climate Change Response Score (CCRS) (see Box 1 for details).

Box 1. Definition and calculation of the CCRS.

The six levels of CCRS are defined as follows:
Level 1: no special activities; no particular response
Level 2: ambition to develop some concrete response
Level 3: some concrete activities according to governmental *guidelines*
Level 4: fewer activities compared to previous level of engagement
Level 5: wide variety of activities at a stable and even rising level
Level 6: wide variety of activities, with exceptional engagement
Level 4 serves no purpose for the statistical analysis presented in this article. Hence, municipalities scored as level 4 were not included in the statistical analysis (9 in 2007 and 2 in 2008). Additionally, for the same analysis the difference between levels 5 and 6 serves no purpose; these were pooled and are henceforth called level 4. Analyses performed without the data deletion and pooling gave similar, or stronger, results.
In 2007, the actual resultant categorisation was arrived at as the result of consultation between the three interviewers. First, the interviewer who had performed a specific interview briefly presented the results of the interview with the municipality to the other two members of the interview team. These were then discussed by the three interviewers until a score was agreed on. If there was disagreement, the person who performed the interview had the final word. To facilitate the scoring process, the interviewer made a short concluding assessment (a few sentences) of the municipality in the interview journal template, directly after the interview was finalised. In 2008, for practical reasons, the scoring was carried out by one of the interviewers. As in the previous year, the categorisation was facilitated by a short concluding assessment of each municipality. This assessment was done by the person who had performed the interview.

In the 2008 survey, an additional question was added to the survey. Consequently, the categorisation was made based on the three questions above as well as the following:

(1) Do you undertake projects, or do you have ideas, that could be considered as exceptional to, or otherwise not in line with, the municipality's ordinary climate change work?

The additional question provided the municipality with the possibility to present climate change action that we otherwise would not have identified as important. The municipalities therefore contributed additional data about how to engage in climate change response and became a fundamental part of a broader knowledge-acquisition process.

In addition, for the analysis of municipal gender awareness, the following question was asked of all informants in the 2008 survey:

(1) Is there anything in your work that relates climate change to any kind of gender dimension?

Based on the answers to that question, each municipality was given a Gender Awareness Score (GAS) (see Box 2 for details). All statistical analyses of CCRS and GAS were performed on a Macintosh Classic from 1989 using the Statview SE Graphics software from 1985. Control calculations with the latest SAS edition on an i7 PC from 2011 revealed no miscalculations.

Box 2. Calculation of the GAS.

For the quantitative analysis of municipal gender awareness, the answers were transformed into a compound binary score (0 or 1), the GAS (Table 2 gives examples of municipalities that received the score 1). This was done by the same interviewer who had made the CCRS categorisation. Municipalities representing low gender awareness in planning, policies or practical climate change response received the lower GAS. Having an applied gender perspective, in relation to specific municipal practical obstacles to gender perspective implementation, was given higher influence over the GAS as compared to non-implemented policies and planning.

Our data give us detailed qualitative knowledge about each municipality, at the same time the data are also quantifiable. This enables us to say something about each municipality as well as the Swedish municipalities as a whole and to detect changes and trends from 2007 to 2008.

Gender and climate change response

Longitudinal change in CCRSs

Between 2007 and 2008, the CCRSs in Swedish municipalities demonstrated a significant 16% increase from 2.5[1] to 2.9[2] (Table 1). In 39% of the municipalities, there was an increase in CCRS, while a surprisingly large number of municipalities (15%) showed a decrease. The average increase in CCRS was mainly due to a 57% decrease in the number of municipalities that received the lowest CCRS (from 26% to 11%) and in the number of municipalities that received the highest scores (4), which increased by 105% from 15% to 31%.

Table 1. Distribution of and changes in CCRSs in Swedish municipalities in 2007 and 2008.

CCRS	1	2	3	4	Mean CCRS ± SD
2007	74	45	119	43	2.5 ± 1.0
2008	32	67	101	88	2.9 ± 1.0
Change	−42	+22	−18	+45	+ 0.4

The quality of the CCRSs

From the 2007 and 2008 surveys, we observe that the municipalities in general consider climate change response to be mainly an issue of mitigation. For many years, Swedish municipalities have been working with energy questions, such as district heating. The energy issue has for a long time been motivated by the need to reduce energy costs. Today the same kinds of initiatives would be considered as related to climate change issues. However, climate change adaptation is slowly entering the municipal scene. By comparing results from 2007 and 2008, both quantitatively and qualitatively, it becomes clear that in the course of 1 year more and more municipalities responded concretely to climate change, both regarding mitigation and adaptation (Dymén *et al.* 2009).

Several of the municipalities interviewed in 2007 and 2008 had established energy and climate change strategies, where concrete action in general consists of energy-smart housing and building, using alternative energy supplies, as well as developing public transportation, with walking and bicycling alternatives, as ways of encouraging citizens to change their behaviour. The need for climate change action is also often stated in the municipalities' master plans. A master plan is a guiding plan for the entire municipal area (Dymén *et al.* 2009).

> Common activities include: energy efficiency in buildings, development of district heating, car pools, measures implemented in the municipalities' own real estate, transport questions, information campaigns, projects in schools, energy advice, and so on. A clear majority of the municipal response to climate change is targeted towards mitigation, whereas few municipalities spontaneously mention adaptation measures. A noticeable trend today is that measures that earlier were referred to as for instance economic efficiency are today mentioned as being for climate change causes. (Dymén *et al.* 2009, p. 132)

Gender awareness in municipalities

Sixty-eight per cent of 288 municipalities received the lower of the two GASs, while 32% received the higher. That we have identified gender awareness in a specific municipality does not imply that a gender perspective is heavily rooted in climate change response activities. In some of the municipalities that reported some kind of gender awareness, there is knowledge about the relation between gender and climate change, but there are no concrete strategies to implement it, even though it is discussed from time to time. In other municipalities, active measures are incorporated to consider gender dimensions in planning processes.

For instance Karlstad municipality reports that: "We have a gender perspective in transportation issues since women and men generally use different means of transport. Men use the car more than women. We need to broaden our approach when dealing with public transport". Among the municipalities that reported some kind of gender awareness, especially seven themes could be identified (see Table 2 for more examples). Among

Table 2. Municipal answers to our question: Is there anything in your work that relates climate change to any kind of gender dimension? The answers are divided into seven categories.

Theme	Example (quotes from the respondents)
Gender-aware actions (7 municipalities)	"In our work, we try to reach out to both women and men. In general, we experience women as being better about and more receptive to change. In the municipal organization itself, one can see that when they are, for example, renting a car, women tend to choose a model that is smaller than the men do and as a result the fuel consumption is less".
Lifestyle and everyday-life perspectives (3 municipalities)	"We do take this aspect into account, although its not the main focus. Attention should always be paid to this. Women tend to be more energy- and resource-efficient and can therefore serve as good role models".
Transportation issues (31 municipalities)	"It comes in a little bit, especially with regard to public transit, which is used by more women that men. But even air-conditioning in the buses is a climate adaptation question. The municipality is in a reference group in another research project and in that project there is a gender perspective. The municipality's work, in general, has an egalitarian foundation. Malmö is also a Fair Trade City, which means that ethical aspects are high on the agenda here".
Physical planning issues (10 municipalities)	"In both the general comprehensive plan and the in-depth comprehensive plan our ambition is to create a city for walkers and bicyclists. This is primarily beneficial for women, children and young people. It is often men, unfortunately, who drive".
Gender representation in working groups (9 municipalities)	"We are 3 women and 3 men who are in the working group for the climate strategy. Women have a bit of a different way of structuring the strategy; they want it to be understandable. The men's point of departure is more the buildings, whereas the women go to the source of the problem, for example, to reduce the energy consumption".
Gender has to be included when applying for national climate change funding (9 municipalities)	"In connection with our KLIMP (energy reduction program) application, we've discussed the personal security question, which is about how more and more are choosing to leave the car at home and bike instead. Living urban milieux are important for this".
Other (24 municipalities)	"Yes! Gender come up off and on; it's always there in the background. Women are real enthusiasts when it comes to ethanol cars. Climate questions focus more on soft values, we're moving away from an earlier focus on technology. The more soft the questions are, the more womanly the questions are".

municipalities that we identified as lacking gender awareness, most answered that they do not have a gender perspective. Some reported a gender perspective, but we categorised them as being "gender blind", or "gender neutral". Such a municipality could answer that, "We are so gender equal, we don't consider gender aspects".

Observing the very ways in which the concept of genus (gender) was used is in itself a valuable source of information, since some informants used the concept in ways that diverted heavily from both the popular usage and the lexical definitions.

We argue that, based on the qualitative results, those municipalities that reported some kind of gender awareness emphasised that differences between women and men are visible when it comes to climate change awareness, attitudes and behaviour. Consequently, leaving the gender perspective unattended could result in insufficient, or even poor, responses to climate change.

Gender and climate change response: correlation and causality?

Compared to the low GAS group, the CCRS was demonstrated to be 26% higher in the high GAS group in 2007 and 27% higher in 2008.[3]

In 2007, the low GAS group demonstrated a lower CCRS[4] as compared to the high GAS group.[5] This pattern was further accentuated in 2008 where the low GAS group received a mean CCRS of 2.6[6] and the high GAS group 3.3.[7] The level of CCRS in the high GAS group was significantly higher as compared to the low GAS group both when using the data in the preceding year of the gender study (2007)[8] and in the same year as the gender study (2008).[9]

The 2007 results rested heavily on 22% of the municipalities' getting the lower GAS also getting the lowest CCRS. The 2008 CCRS data were more evenly distributed over the two GASs. Among the municipalities receiving the higher GAS there was a 92% between-year decrease in the number of municipalities that received the lowest CCRS and a 133% increase in the number of municipalities that received the highest CCRS. Three municipalities, Växjö, Mölndal and Lund, received the highest CCRS both in 2007 and 2008; all of them also belonged to the high GAS group.

The results mentioned above demonstrate that there is a correlation between a high level of CCRS and a high level of GAS. What the quantitative data cannot tell are whether or not these two variables are dependant on one another or not (causality). Through our qualitative data, we are able to say something about the dependence by analysing the interviews with the municipal experts.

The informants repeatedly pointed at direct causal relationships between gender and climate change response, not only regarding attitudes and behaviour of citizens, but also regarding attitudes and behaviour of officials who work and make decisions in the municipal administration. Especially, those municipalities that reported the importance of having a gender balance in working groups emphasised that municipal officials, depending on their gender, can have different approaches to climate change-related work. Furthermore, that there was such a multitude of statements, such as: "Women are enthusiasts when it comes to ethanol cars"; "Women are interested in the energy problematics per se and not in the technical solutions"; "Women choose more energy-efficient solutions to transportation"; "Women have a better understanding of the question … men often prioritize other issues"; and "Women are more interested", suggests a causal relationship between gender awareness and climate change response.

Discussion

The main aim of this study has been to investigate if and how gendered aspects of climate change response are integrated in the Swedish response to climate change. Furthermore, we wanted to investigate potential causal relationships between a high level of awareness, among Swedish municipalities, of the gendered aspects of climate change and the general levels of climate change response. The main result is that we have found quantitative and qualitative support for the claim that gender awareness is relevant in achieving strong and concrete responses to climate change.

Longitudinal change in CCRSs

The significant 16% increase in CCRSs between 2007 and 2008, in general; the 57% decrease in the number of municipalities that received the lowest CCRS; and the 105% increase in municipalities that received the highest (4) CCRS, reflects a rapid change, or even a turning point, in climate change awareness in many municipalities. However, the decrease in climate change response in 15% of the municipalities also shows that there are ample opportunities for further improvement.

Gender awareness and CCRSs

Our quantitative and qualitative data convincingly confirm our main theory, that high gender awareness is associated with a high level of climate change response. The majority of the municipalities (68%) ended up in the group with low awareness of gendered aspects of climate change, however. This is hardly surprising given the almost non-existent scientific attention these questions have been given so far. Among the municipalities that have reported gender awareness the functional dimension is much stronger than gender equality. The functional dimension implies that gender is incorporated into municipal climate change response, not to foster equality, but rather to achieve strong and concrete climate change response.

The literature we refer to in this article is rather coherent when it comes to arguing that there are gender differences regarding attitudes and behaviour related to environment. What the literature is not decisive about is whether or not these differences contribute to stronger or weaker responses to climate change on a public level, through for instance municipal action and policies. Our study contributes to lessening that gap by indicating that there is a relationship between awareness of gendered attitudes and behaviour related to climate change and municipal action and policies. Our results also indicate that it is important for a municipal administration to consider gender balance, given that women and men can have different approaches to the issue of climate change. In some municipalities, this is done by ensuring that working groups are gender-balanced.

Encouraging equal representation in planning and decision-making processes is only one of many ways in which gender perspectives on everyday life, including attitudes and behaviour to the environment and climate change, can be incorporated in municipal administration. Creating such an equal distribution is still not a guarantee for achieving gender awareness. Equal distribution has the potential to foster both gender equality and strong climate change response, but, other more qualitative approaches, such as citizen participation (cf. Larsen and Gunnarsson-Östling 2009), interdisciplinarity and intersectoral approaches that include the everyday-life knowledge of citizens, should also be considered (Dymén and Langlais 2012, Dymén *et al.* 2010).

In further research, we will study which gender regimes and power structures, at the municipal level, influence and highlight the relation between their agendas and the issue of climate change mitigation and adaptation response. That study will be carried out so as to include indications, from other studies, that urban municipalities score higher on gender equality indexes. Our aim is to merge those studies, and delve deeper into the problem with the help of qualitative analyses.

In sum, we can say that evidence collected from each, and all, Swedish municipalities demonstrates a highly significant co-variation between organisational awareness of gendered aspects of climate change-related problems and the general level of climate change response. Evidence also indicates that there may be a causal relationship between gender awareness and climate change response. Our interviews further support this evidence and suggest several causal paths leading from gender awareness to strong climate change response.

Methodological concerns

There is reason to suspect a certain degree of autocorrelation in our data. In municipalities with a high CCRS, such as Växjö, Mölndal and Lund, the higher level of engagement, interest and competence regarding climate change response could be spilling over to the awareness of gender. Furthermore, other factors such as a municipality's economy and level of education certainly influence climate change response and gender awareness. However, the disproportionate increase in CCRS among high GAS municipalities suggests a potential causal relationship between gender awareness and climate change response and calls for further examination of the matter. Even more supportive of this potential causal relationship is the result that our qualitative data strongly support that gender awareness fosters strong climate change response.

Although we attempted to avoid this, the CCRS drop in 15% of the municipalities could partly reflect a generally elevated level of self-criticism among representatives, as municipalities acquired higher competence levels regarding climate change, and additional opportunities for comparing their efforts with the general national and international progress (or lack of it).

In addition, activities that previously were labelled as being important for economic and energy efficiency are more and more being labelled as examples of climate change response, even though the activity, as such, is the same. The shift from seeing measures as being responses to an energy issue, to identifying them as a concrete response to climate change, appears to derive from the media's growing attention, changes in the political debate and individuals' perceptions of noticeable changes in climate, as exemplified, for instance, by more frequent occurrences of extreme weather. Even though the issue of climate change remains a "hot spot" in the Swedish debate, we feel that the awareness of its gender dimensions indicates that a certain maturity which is in its initial, but perceivable, phases is emerging (Dymén *et al.* 2009).

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Notes

1. SD = 1.0; $n = 281$.
2. SD = 1.0; $n = 288$ (paired Wilcoxon signed-rank test: $n = 279$, Z correlation: -6, $p < 0.0001$).
3. We want to make the reader aware of that GAS was only assigned for the 2008 survey. However, we still analyse those municipalities in 2007.
4. Mean $\pm$ SD = 2.3 $\pm$ 1.0.
5. Mean $\pm$ SD = 2.9 $\pm$ 0.9.
6. SD = 1.0.
7. SD = 0.8.
8. Mann–Whitney U-test: $n = 281$; Z correlation = -4.4; $p < 0.0001$.
9. Mann–Whitney U-test: $n = 288$; Z correlation = -6.59; $p < 0.0001$.

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