



Sex differences in the effects of acute stress on behavior in the ultimatum game

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ABSTRACT

Acute stress affects human decision making. It has been argued that there are systematic sex differences in behavioral responses to acute stress, with males showing a ‘fight or flight’ and females showing a ‘tend and befriend’ response. A ‘tend and befriend’ response would suggest that women become more cooperative under acute stress, while men do not. We investigated the effects of acute stress on social behavior. We induced stress via the Trier Social Stress Test (TSST) and then immediately after measured how participants reacted to offers made in the ultimatum game by a male proposer. We found that female participants were less likely to reject offers under stress ($n = 25$) vs. no stress ($n = 37$), $p = 0.009$, independent of how fair these offers were, cooperative behavior consistent with the ‘tend and befriend’ hypothesis. Male participants when stressed ($n = 30$) did not show differences in rejections rates compared to the control condition ($n = 26$), $p = 0.41$. Our results provide support for a qualitatively different behavioral response to acute stress among men and women.

1. Introduction

Stress is a universal human phenomenon that has been studied for almost a century. First described as an unspecified response to harmful stimuli, the original conception of stress focused primarily on physical stressors such as heat, cold and threats within the physical environment (Seyle, 1956). However, since then a large body of literature has accumulated exploring psychosocial stress triggered by the cognitive appraisal of situations. Regardless of its trigger, stress is known to cause physiological, psychological and behavioral consequences that have been primarily defined as the ‘flight or fight response’. The stress response is driven by an initial activation of the sympathetic nervous system leading to a rapid increase in circulating catecholamines that prepares the organism for action. This is followed by a slower and more prolonged activation of the hypothalamic-pituitary-adrenal axis which leads to the release of cortisol peaking approximately 20–40 min after exposure to the stressor (Joëls and Baram, 2009; McEwen, 2007; Tank and Wong, 2015).

Understanding how stress influences the decision-making process is of critical significance. In reviewing the body of literature considering this topic Starcke and Brand (2012) report that activation of the stress response often leads to activation of ‘lower level’ more automatic

processing of information and a reduction in controlled cognitive processing. In line with this, we have shown that moral decision making under stress predisposes participants to more automatic, less utilitarian decisions when confronted with high-conflict moral dilemmas (Youssef et al., 2012). It has been suggested that the activation of the ‘fight or flight’ response triggers a tradeoff; it allows rapid automatic decisions that may be important in responding to physical harms but when dealing with complex cognitive choices may not always be beneficial.

One criticism of research on stress is that many studies included male participants only and as such the generalization of the ‘fight or flight’ response across sexes may not be appropriate. Indeed, Taylor (2000) argued that among women, stress triggers an alternative behavioral response and coined the phrase ‘tend and befriend’. According to this model, rather than activating aggressive behavior and heightened arousal (the typical pattern seen among men), stress triggers heightened levels of conciliatory and relationship building endeavors among females. These cooperative processes are believed to be due to increased levels of empathy and involve release of the hormone oxytocin.

There is some evidence supporting the idea of a differing stress response between men and women resulting in sex-specific decision-making under stress. As an example, acute stress has been shown to increase risk taking in men but to decrease risk taking in women

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(Lighthall et al., 2012, 2009). In situations that involve rewards, punishments, and uncertainty, acute stress improves decision making in women, but impairs it in men (Preston et al., 2007) - an effect that is correlated with increases in salivary cortisol levels (van den Bos et al., 2009). Going beyond these results, the ‘tend and befriend’ model implies increased cooperative, prosocial behavior amongst women under stress, whereas men might show an increase in aggressive behavior.

Sex differences in the effects of stress on social behavior have only recently been explored. Several recent studies have investigated the effects of stress on social behavior in the ultimatum game. In the ultimatum game, player A (the proposer) suggests how to split a portion of money with another player B (the responder). The responder has the opportunity to either accept the proposed split, in which case both players get the money as suggested, or to reject the split, in which case both receive nothing. The rejection of offers has been described as costly punishment, because responders incur personal costs in order to punish others (Fehr and Gächter, 2002). Such punishment is usually inflicted when the proposer has violated social norms, specifically the norms of fairness. Numerous studies using male and female participants in the ultimatum game have shown that responders often reject offers below 30% of the stake (unfair offers) even though it is to their economic benefit to accept all offers greater than zero regardless of the amount (Camerer, 2011).

There is evidence that costly punishment is an impulsive reaction driven by negative emotional responses to perceived norm violations (Crockett et al., 2010b; Harlé and Sanfey, 2007; Yamagishi et al., 2009). This reaction to norm violations may represent an evolutionary adaptation that promotes cooperation in environments in which there is competition for scarce resources. It has been argued that costly punishment is a form of prosocial behavior, because in order for fairness and prosocial behavior to gain traction within the wider social setting it is perhaps as important to punish ‘bad behavior’ (in the case of the ultimatum game unfair offers) as it is to exhibit and reward cooperative behavior. However, although the ‘ultimate’ effects of costly punishment may serve to promote cooperation, there is evidence that the proximate mechanisms driving punishment behavior – that is, the psychological motivations behind punishment “in the moment” – are antisocial in the sense that they involve a desire to harm the norm violator rather than a desire to enforce fairness norms. Crockett et al., (2014) showed that people are still willing to punish norm violators even when a fairness norm cannot be enforced because the violator never learns they were punished. In addition, psychopaths, who show a blatant disregard for social norms, are more likely to punish unfairness in the ultimatum game than healthy controls (Koenigs and Tranel, 2007). Thus, costly punishment behavior in the ultimatum game may serve as a useful index of aggressive, “fight or flight” responses on the one hand, while accepting unfair offers in the ultimatum game may represent a conciliatory, “tend and befriend” response on the other hand.

Two previous studies have investigated sex differences in costly punishment in response to stress (see supplementary information for an overview). One study sought to broadly explore the effect of (psychological) stress on cooperative behavior by utilizing three tasks – the ultimatum game, a Prisoner’s Dilemma game and a pro-social risk-taking task (Nickels et al., 2017). Utilizing a sample size of 120 college students from the USA they reported no difference in rejection rates in the ultimatum game among male and female participants. However, in this study, fairness of offers was not manipulated within subjects. In addition, participants’ cortisol levels were not measured following the stress manipulation which was only validated via self-report measures. The second study, in contrast, used a 20-round version of the ultimatum game in which individuals were exposed to a range of offers (Prasad et al., 2017). They observed that women were more likely to accept unfair offers when under stress but this was not the case for men. This data supports the ‘tend and befriend hypothesis’ that when exposed to stress women will behave in a more cooperative manner, in contrast to

men. This study, conducted in Singapore, had a small sample with only $N = 20$ males and $N = 19$ females, which suggests it had low test power due to the small sample size, which made it unlikely to detect effects of stress which can be subtle. The authors of this study acknowledged their results should be treated as preliminary and called for a replication in a larger mixed-sex sample. Hence, in the current study we investigated sex differences in the effects of stress on behavior in the ultimatum game, building on previous similar work by a) using a large sample, b) validating our stress manipulation physiologically using cortisol level measurements, and c) using multiple one-shot ultimatum games to cover a range of fairness of offers and increase within-subjects power.

2. Materials and methods

2.1. Design and participants

Approval for this study was granted by the Ethics Committee of the Faculty of Medical Sciences at the University of the West Indies (UWI). The study had a 2 (stress: stress vs no stress) x 2 (sex: male vs female) x 3 (offer fairness: unfair vs borderline vs fair) mixed design. Stress and sex were between-subject factors; offer fairness was manipulated within-subjects. We recruited $N = 142$ participants, of which 24 were excluded (13 male, 11 female) from data analysis because they did not show a physiological stress response despite being in the stress condition (as determined by the cortisol measurement), or they did show a physiological stress response despite being in the control condition. Our final sample thus consisted of 118 subjects, average age 21.1 ± 2.1 years, who were randomly grouped into experimental conditions as follows: 26 male control; 30 male stress; 37 female control; 25 female stress. A brief medical and social history was taken and participants with a history of psychiatric or neurological illness were excluded from this study, as were those who had previously been exposed to the Trier Social Stress Test (TSST) or the ultimatum game. Participation was on a volunteer basis and no financial compensation was given for participation in the study. However, participants received the financial outcomes from one randomly selected trial of the ultimatum game task they played as part of the experiment.

2.2. General procedure

The study was carried out between 1:00 pm and 5:00 pm to minimize circadian variations in cortisol levels. Participants were asked not to eat or drink for at least one hour prior to participation to ensure accurate salivary cortisol measures. Upon arrival, the study was explained to participants, a brief medical and social history was elicited and they were required to provide informed written consent prior to participation. Participants were then randomly assigned to either the control condition or the stress condition. They filled in a brief demographic questionnaire and were allowed ten minutes to relax in a quiet room before the first salivary sample was taken (timepoint 1). After that, depending on condition, they were exposed to the stress manipulation or the control manipulation (both standard TSST, see below) and took part in an ultimatum game task. This was the only task required of participants, and immediately after the study they were debriefed.

2.3. Stress induction

Stress was induced with the Trier Social Stress Test (TSST), a well validated paradigm that has been shown to reliably and effectively induce social-evaluative threat in a laboratory setting (Kirschbaum et al., 1993). In the stress condition, participants were instructed that they were selected to undergo a mock job interview. They were then provided with a pen and a piece of paper and asked to prepare for five minutes to give a speech to the interviewing panel explaining why they

should be hired. After preparation they were invited into the interview room but upon entry they were required to give up the piece of paper with their notes to the interview panel. The five-minute interview was carried out by a panel of three (mixed sex) confederates who did not provide any verbal or non-verbal feedback. A video camera was also present and participants were told that the session was being taped for subsequent analysis and that members of the panel were trained in non-verbal behavioural observational analysis. At the end of the interview, participants performed a five-minute mental arithmetic task in which they were required to sequentially subtract 17 from 4-digit numbers, starting with 1683. Every time they made a mistake they were required to start the task again. At the end of this process the second saliva sample was taken (timepoint 2) and then participants were escorted to the computer to take part in the ultimatum game task. This took place immediately and as such participants began the UG within five minutes of completing the TSST manipulation.

In the control condition, participants also prepared a speech but the topic was to describe a favourite book or vacation. They were then asked to deliver this speech in an empty room. After five minutes, they were asked to count slowly in tens for five minutes. Once this was completed, a saliva sample was taken (timepoint 2) and then participants were escorted to the computer to take part in the ultimatum game task.

2.4. Ultimatum game

The ultimatum game task was adapted from previous studies (Crockett et al., 2013, 2010a). The game was explained to participants and they were instructed that they would be playing the game with other participants who consented to their pictures being taken and used for this task. During each trial, participants were presented with a photograph of the proposer that appeared on the screen for 1.5 s. Thereafter, they saw the total stake for 1 s and finally the amount that there were being offered for 3 s. In all cases, the proposers shown on the images were male. There was a total of 24 trials, each with a different proposer. There were 8 “fair” proposals, ranging from 40 to 50% of the stake; 8 “borderline” proposals, ranging from 27 to 33% of the stake; and 8 “unfair” proposals, ranging from 18 to 22% of the stake (stake range was from TT\$10 to TT\$300). To reduce the effect of the absolute value of the monetary offer in different trials the same amount could be either a “fair” offer or an “unfair” offer. During the task, participants’ response times were measured. At the end of the task, the third and final salivary cortisol sample was taken (timepoint 3) and then participants were debriefed before leaving. In total, three saliva samples were taken. To collect saliva persons were asked to chew briefly on a cotton swab until it was saturated and then the saliva was collected in Eppendorf tubes. Samples were kept frozen at -20°C until analyzed via ELSIA kits purchased from Salimetrics Inc, USA.

2.5. Data analysis

We analysed rejection rates and modelled this using generalized estimating equations with a logistic link function as utilized in previous studies (Crockett et al., 2010a; Koenigs and Tranel, 2007). This procedure is equivalent to a repeated-measures ANOVA for binary (yes/no) data. Post hoc analysis was carried out by pairwise comparisons using the Bonferroni test. In all cases, significance threshold (p) was set at 0.05.

3. Results

3.1. Salivary cortisol

Salivary cortisol levels were analysed using ANOVA with timepoint serving as the within-subject variable and stress and sex serving as the between-subject factors. As described above, participants for whom the

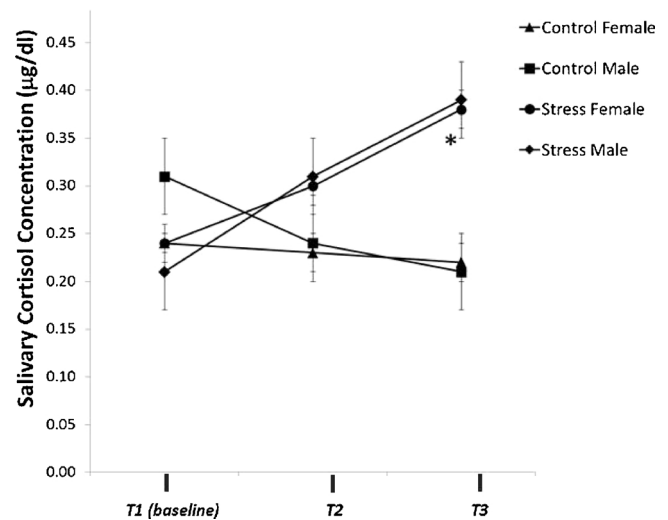


Fig. 1. Change in salivary cortisol levels during the Trier Social Stress Test. The TSST manipulation led to a significant increase in salivary cortisol over the course of the experiment * indicates $p < 0.05$. An area under the curve analysis also showed a difference in salivary cortisol between control and stressed subjects ($p < 0.01$).

experimental manipulation was not successful where excluded from data analysis. For the remaining sample, that there was a significant main effect of the stress manipulation on the levels of salivary cortisol with the stressed group showing an increased level of salivary cortisol following the TSST as compared to the non-stressed group $F(1,353) = 9.45$; $p = 0.002$; the mean cortisol level for the control group was 0.24 ± 0.02 and $0.31 \pm 0.02 \mu\text{g/dl}$ for the stress group. There was no main effect of timepoint $F(2,353) = 1.84$; $p = 0.16$ or sex $F(1,353) = 0.1$; $p = 0.75$. However there was a significant stress manipulation**timepoint* interaction, $F(2,353) = 8.00$; $p < 0.001$. Thus, the stress manipulation lead to an increase over time as opposed to the control condition, Fig. 1. These findings were supported by an area under the curve analysis (AUC) utilizing the trapezoid method: the stressed group demonstrated a larger area (9.2 ± 0.8) under the curve compared to the control group (6.8 ± 0.6 ; $p = 0.014$). Similar results were found for both male and female participants (see Fig. 1). So we established that our experimental condition experienced physiological stress, as compared to the control condition.

3.2. Ultimatum game

We analysed participants’ rejection rates of proposer offers using generalized estimating equations. Overall, there was a main effect of offer fairness ($\chi^2 = 395.8$; $p < 0.001$) with rejection rates increasing as offers became more unfair. Borderline offers (mean rejection rate = 0.48 ± 0.02) were rejected more often than fair offers (0.13 ± 0.01 ; pairwise comparison, $p < 0.001$), and unfair offers (0.62 ± 0.02) were rejected more often than borderline offers (pairwise comparison, $p < 0.001$). There was no main effect of stress: overall, stressed participants (0.36 ± 0.02) did not reject offers more or less often than non-stressed participants (0.39 ± 0.02 ; $\chi^2 = 1.53$; $p = 0.22$). There was also no main effect of sex: male participants (0.37 ± 0.02) did not reject more or fewer offers than female participants (0.38 ± 0.04 ; $\chi^2 = 0.03$; $p = 0.86$). However, there was a significant two-way interaction between stress and sex ($\chi^2 = 5.8$; $p = 0.016$). Compared to control subjects when females were stressed they demonstrated a significant decrease in rejection rates (0.42 ± 0.02 vs 0.34 ± 0.02 ; $p = 0.009$). Pairwise analysis of male participants did not demonstrate a significant difference between stressed and non-stressed male subjects (0.36 ± 0.02 vs 0.39 ± 0.02 , $p = 0.41$; see Fig. 2). Further analysis of the three-way interaction between

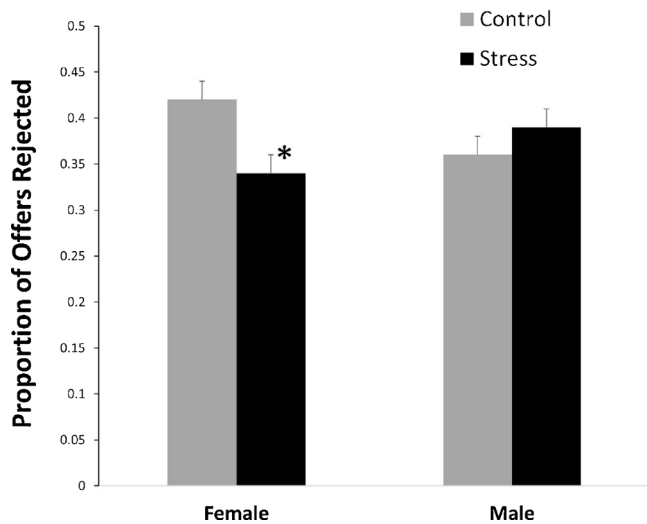


Fig. 2. Proportion of rejected ultimatum game offers. Stress lead to decreased rejection rates in female participants (* indicates $p < 0.05$). For male participants, no difference depending on stress was found.

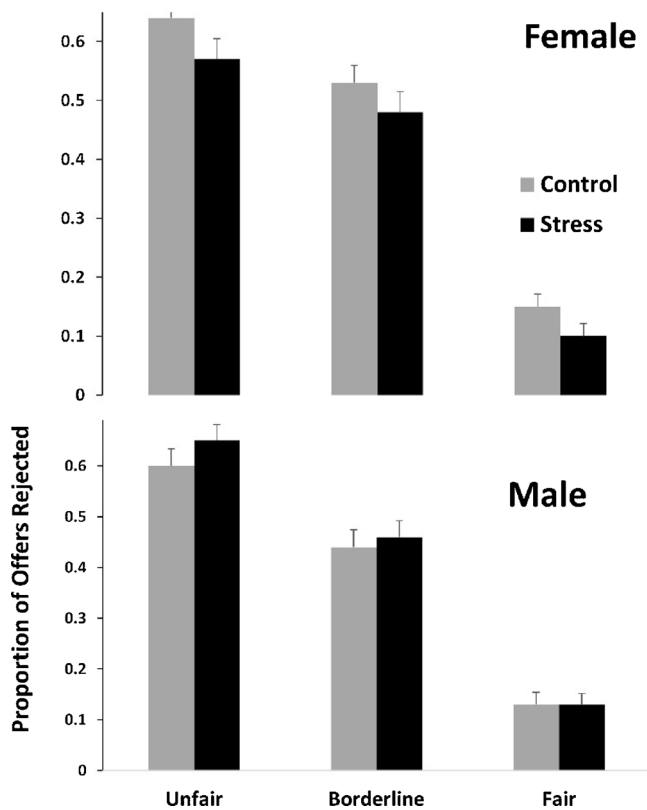


Fig. 3. Proportion of offers rejected ultimatum game offers by offer fairness. For both female and male participants, rejection rates increased with offer unfairness (p for all single comparisons < 0.05). No three-way interaction between group*sex*offer fairness was found.

group*sex*offer fairness demonstrated no significant difference ($\chi^2 = 0.42$; $p = 0.81$; see Fig. 3).

Regarding reaction times, i.e. the average time participants took to make a decision when deciding to accept or to reject an offer, data demonstrated a significant effect of offer fairness ($\chi^2 = 44.5$; $p < 0.001$). Not surprisingly, across both conditions fair offers were accepted significantly faster than unfair offers ($1.6s \pm 0.07$ vs 1.89 ± 0.08 ; $p < 0.001$) and borderline offers (2.06 ± 0.09 ; $p < 0.001$). Reaction times were longest for borderline offers. Stressed

participants did not take significantly longer to make decision when compared to controls ($\chi^2 = 0.08$; $p = 0.78$) and there was also no difference between sex ($\chi^2 = 0.05$; $p = 0.83$). There was no significant sex*stress interaction ($\chi^2 = < 0.001$; $p = 0.98$) nor was there a significant three-way interaction offer*stress*sex ($\chi^2 = 1.04$; $p = 0.59$).

4. Discussion

In this laboratory study, we examined sex differences in the effects of stress on behavior in the ultimatum game. We used the TSST to induce acute stress and found that stress induced different responses among male and female participants who were exposed to a male proposer: women showed *decreased* rejection rates across all offers while men did not show differences in rejection rates when acutely stressed.

Our results support the idea that when exposed to stressful conditions, women seek to build relationships as a means to survival - the ‘tend and befriend’ response. In this model, females close ranks when stressed and demonstrate cooperative behavior that both increases the chance of survival by affiliating with others and also reduces the negative physiological effects of stress. Our findings therefore support the preliminary work of Prasad et al. (2017) who also found that under stress women reject offers less frequently than control conditions in the ultimatum game. Although they do not find this in a one-shot ultimatum game, but a Prisoners Dilemma Game and a pro-social risk-taking task, Nickels et al. (2017) also report that stress promotes cooperative behavior among women.

The ‘tend and befriend’ response is believed to be mediated by the hormone oxytocin (Cardoso et al., 2013) which in turn may attenuate the typical fight or flight stress response (DeVries et al., 2003). Indeed, oxytocin has been shown to enhance the habituation of autonomic arousal especially in social situations (Keri and Kiss, 2011). One study that sought to explore directly the prosocial effects of oxytocin during the ultimatum game did not report any change in rejection rates among participants exposed to the hormone (Radke and de Bruijn, 2012). However, this study only included male participants and as has been highlighted the ‘tend and befriend’ response seems to be particularly present in women due to high levels of oestrogen which enhance the response to oxytocin. Taken together, our results coupled with previously published data now provide evidence that women – in contrast to men - show increased cooperative behavior under stress.

One of the challenges in interpreting results from the ultimatum game is that various hypotheses have been put forward to explain the rejection of unfair offers. It has generally been suggested that rejection of unfair offers represents a preference for fairness and reciprocity in which people are willing to punish those who violate norms at personal expense. However, more recent research has demonstrated little or no correlation between rejection of unfair offers in the ultimatum game and prosocial tendencies in other cooperation games (Brañas-Garza et al., 2014; Yamagishi et al., 2012). Based on these findings it is suggested that people who reject unfair offers may not represent a homogenous group, but rather distinct sub-groups driven by different motivations. Potential sub-groups include people who reject offers to enforce norms, anti-social or ‘spiteful’ punishers who reject unfair offers as a form of retribution, and people who seek to negate the perceived sense of inferiority that comes with an unfair offer. Applying these considerations to the results of our study, if one of these motives would be the prime mechanism changed by the stress manipulation, we might have observed an interaction depending on the level of offer fairness. However, we found that rejection rates amongst female participants decreased across offers of all fairness levels and not just unfair offers. We therefore suggest our results reinforce the idea that females are more willing to demonstrate pro-social and cooperative behavior under stress. However, we cannot rule the possibility that cooperative behavior is not driven by pro-sociality but simply a means of emotional regulation and a desire to reduce further stress. We also cannot rule out

the possibility that multiple sub-groups of responders existed who exhibit similar behavior but are driven by differing motivations. It would be a fruitful area for future research to investigate which specific motives for (non-) cooperation are influenced by stress.

Building upon this idea that the rejection of (unfair) offers is not driven by the desire to enforce social but rather is an impulsive or automatic desire to punish the proposer in a ‘tit for tat’ scenario, it has been suggested that this response is driven by activation of feelings of anger, disgust and a desire for retribution (Crockett et al., 2014). If this is indeed the case it is reasonable to assume that such responses would be exaggerated among men due to the increased autonomic arousal triggered by stress. Indeed it has been shown that rejection of unfair offers correlates with increased skin conductance (van’ t Wout et al., 2006) and salivary alpha amylase levels (Takagishi et al., 2009), suggestive of autonomic arousal and engagement of faster more automatic systems of decision making. Likewise, induction of anger has been shown to increase rejection rates (Andrade and Ariely, 2009).

Given this data it has been hypothesized that men should show increased rejection rates under stress due to increased arousal. However, our findings did not demonstrate this as there was no significant change in rejection rates among males in response to stress. Our findings are in line with both the studies by Prasad et al. (2016) and Nickels et al. (2017) who also did not find a significant increase in rejection rates among men. It is important to note though that in all three of these studies no measure of autonomic arousal was documented. Therefore, we cannot definitely rule out the hypothesis that autonomic arousal triggered by stress increases rejection rates during costly punishment among men. However, one way to interpret these results might be to adopt a conservation of energy approach: acute stress induces a need to preserve resources, which might also go along with a need to preserve social bonds and to affiliate with one’s social group. Such reasoning would suggest increased offer acceptance rates in the ultimatum game especially under a ‘tend and befriend’ motive, but also explain why even men, more prone to a ‘fight or flight’ response, would accept unfair offers under acute stress.

Another way to understand the pattern of results we found among men may be the time course of the response to acute stress. The increase in cortisol post-stress may actually attenuate negative emotions not increase it at least during the immediate ten minutes following stress induction (Het et al., 2012) a finding that is consistent with our results in which subjects were required to participate in the ultimatum game immediately after completing the stress manipulation. Indeed, a study by Vinkers et al. (2013) that did explore the time course of the stress response also found no significant increase in rejection rates immediately after stress. They also reported though that over the course of 75 min, the tendency for the rejection of offers among men went down (Vinkers et al., 2013). In order to explain their results they suggested that acute stress evokes immediate impulsive reactions in men that increases the tendency for costly punishment as an immediate or automatic reaction to stress though they did not find evidence to support this idea. They then went on to suggest that over the course of time men gain back their self-control and can show more deliberate, self-serving behavior by accepting offers that are not fully fair, but benefit them economically, a hypothesis that may well be accurate. Clearly more research is needed in this area but the idea that the behavioral responses to stress follows a time course is not unusual as memory retrieval has been shown to be improved during a stressful experience as a response to autonomic arousal but as cortisol levels continued to rise post stress memory retrieval progressively got worse (Schwabe and Wolf, 2014).

In considering our results it is important to note two limitations associated with this study. Firstly, recent work suggests that the response to stress in women can be influenced by the phase of the menstrual cycle and the use of oral contraceptives (Bale and Epperson, 2015). We did not control for this. However, we focussed our study only on those participants that actually demonstrated an increase in cortisol

response to stress and as such even though the response may have been blunted in some women due to the phase of their menstrual cycle, there was a secured physiological stress response in our female experimental group. Also note that there was no difference in the stress response between men and women in our final sample. Secondly, the proposers shown to participants in our study were always male. Previous research has found differences in rejection rates depending on proposer sex, while the direction of such effects is not yet clear. While Solnick (2001) found higher rejection rates when offers were made by women, Eckel and Grossman (2001) report higher rejection rates for offers made by men (Eckel and Grossman, 2001; Solnick, 2001). And again, this can depend of the sex of the recipient of the offer (Eckel and Grossman, 2008). Hence, we decided to keep the sex of the proposer constant, rather than matching it with the participants’ sex (as done by Nickels et al., 2017). What follows is that based on our data we cannot rule out the possibility that reduced rejection rates women showed under stress are due to being exposed to an opposite-sex proposer (while men in our study were exposed to a same-sex proposer). We hope that future research can bring together the lines of research that look at proposer sex and that investigate recipient sex (as our study does) and manipulate both proposer and recipient sex as a systematic experimental factor.

In sum, our results provide further evidence that under conditions of acute psycho-physiological stress men and women show differences in behavior. In this case women were more likely to show cooperative behavior following a stress manipulation consistent with the ‘tend and befriend’ hypothesis. In contrast men did not show any differences in behavior as compared to controls. This supports previous research showing that stressed participants show differences in strategic reasoning (Leder et al., 2013), goal-directed decision-making (Otto et al., 2013; Schwabe and Wolf, 2014) and moral judgements (Suter and Hertwig, 2011; Youssef et al., 2012). Whether these differences in behavior are due to decisions being more ‘impulsive/automatic’ or not is an open question.

On a more general level, our findings are in line with the argument that we need to be careful when making predictions how psycho-physiological factors translate into decision making in the social context, as different moderators come into play (Faber et al., 2017). In our case, our results suggest that the behavioral response to stress does generalize across social contexts: our study was carried out within the Caribbean region, hence using a ‘non-WEIRD’ population (Henrich et al., 2010). However, our results also make clear that we need to investigate potential sex differences in psycho-physiological processes such as stress when we want to understand their behavioral correlates.

Conflict of interest

The authors hereby affirm that they have no competing or conflicts of interests.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.psyneuen.2018.06.012>.

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