The Role of Emotions in Predicting Sperm and Egg Donation

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Abstract

Across two studies, we assessed the role of social-cognitive and emotional factors in promoting and deterring sperm and egg donation. Study 1 (N = 138 men) found that feeling anxiety towards discovering a fertility problem and pride positively predicted sperm donation intention and information seeking behaviour. By contrast, feeling anxiety towards the process of donation negatively predicted sperm donation intention and information seeking behaviour. Study 2 (N = 193 women) found that pride positively and the anxiety towards the process negatively predicted egg donation intentions, but not information seeking behaviour. These results suggest that it is important to consider the role of emotions in motivating and deterring people from becoming a sperm and egg donor.

Keywords: sperm donation; egg donation; emotions

Introduction

Sperm and egg donation are highly beneficial to the lives of people who cannot have children naturally. Despite this, there has been reports that the demand for sperm and egg donors is greater than the supply in numerous countries from across the world, including the UK (Human Fertilisation and Embryology Authority, 2011), Australia (Western Australian Reproductive Technology Council, 2008), New Zealand (Advisory Committee on Assisted Reproductive Technology, 2015) and Sweden (Ekerhovd et al., 2008). With this shortage of donors, it is important to determine the factors that promote and deter sperm and egg donation. This was the aim of the current research.

Numerous factors are likely to predict sperm and egg donation. Altruism predicts both forms of donation (Kenney & McGowan, 2010; Lalos et al., 2003). Moreover, social-cognitive variables are also likely to predict donation (Purewal & van den Akker, 2009b; Van den Broeck et al., 2012). In line with one social-cognitive theory (theory of planned behaviour; Ajzen, 1991), research has suggested that donation is likely to be predicted by people's attitude towards donating (attitude), the belief that significant others (e.g., friends and family) support the donation (subjective norm) and the belief that they have the ability to choose whether or not they donate (perceived control; Purewal & van den Akker, 2006, 2009a). Health behaviours are also likely to be predicted by the belief that one is able to undertake an action (i.e., self-efficacy; Bandura, 1977). Although perceived control and self-efficacy are often closely related, research has demonstrated that they are separate constructs (for a discussion, see Armitage & Conner, 1999). Indeed, self-efficacy involves the individual's perceptions that they have the ability to undertake the action (i.e., 'I will be able to donate my sperm/eggs'), thereby focusing on internal factors. However, perceived control involves the control over being able to choose to undertake the action (i.e., 'I am able to choose whether or not I can donate my sperm/eggs'), thereby focusing on more external

factors.

Although these factors are important, research has suggested that emotions are likely to be stronger predictors of bodily donation (i.e., blood and organ donation) than altruism or social-cognitive factors (Ferguson et al., 2012b; Morgan et al., 2008; Shepherd & O'Carroll, 2014). For example, positive emotions have been found to promote blood donation (Ferguson et al., 2012a), while feelings of disgust prevent organ donation (O'Carroll et al., 2011). As such, it is important to assess the extent to which emotions are also likely to promote and deter sperm and egg donation. Despite this, there has been little research assessing the role of emotions. Therefore, the aim of this research was to assess the role of emotions in promoting and deterring both sperm and egg donation.

Emotions and Bodily Donation

The emotions that are felt are likely to vary depending on the interpretation (or appraisal) of the action (Roseman, 1984; Smith & Lazarus, 1993). As such, egg and sperm donation are likely to elicit a variety of emotions, depending on how people view these actions. For example, pride is a positive self-conscious emotion felt when people regard their actions as praiseworthy (Roseman et al., 1996; Tracy & Robins, 2004) and is likely to stem from moral actions (Tangney et al., 2007). Given the altruistic nature of donating, it is regarded as a moral action (Mohr, 2014). As such, people are likely to believe that they should feel pride for donating bodily material. Indeed, blood donation research has suggested that being a donor is associated with people feeling positive about themselves (i.e., a warm glow) and that this promotes donation (Ferguson et al., 2012a, 2012b). Similarly, the belief that organ donors are heroic is positively associated with donation (O'Carroll et al., 2011). Moreover, research has suggested that women may feel proud of donating eggs (Kenney & McGowan, 2010) and that men believe that donation may make them feel good about

themselves (Van den Broeck et al., 2012). As such, donation seems to be eliciting feelings of pride.

People may also feel anxiety towards becoming a sperm or egg donor. Anxiety is likely to be felt when an action is viewed as threatening (Folkman & Lazarus, 1985). Anxiety is often believed to promote avoidance behaviours (Carver & Harmon-Jones, 2009) and may thus act as a barrier to health behaviours (e.g., Flowers, Knusen, & Church, 2003). However, recently researchers have argued that anxiety may both promote and deter health behaviours, depending on the object that is eliciting the emotion (Shepherd & Smith, 2017). There may be various different objects of anxiety when donating sperm and eggs. For example, the process of donating may elicit concerns regarding a variety of physical and psychological threats. For example, people may be concerned about giving a sample at the clinic (Lui et al., 1995) or that people may find out they are a donor (Shover et al., 1992). Similarly, women may be concerned about the perceived risk of damaging one's future fertility (Kenney & McGowan, 2010). Given the easiest way to avoid this anxiety is not to donate, this *anxiety towards the process* may deter sperm and egg donation. A second object of anxiety may be discovering a fertility problem (Cook & Golombok, 1995). Unlike the anxiety towards the process, the anxiety towards discovering a fertility problem is unlikely to be avoided by not donating because the concerns about one's fertility are likely to continue to exist. Instead, people may be motivated to donate in order to be reassured about their fertility. Indeed, research has suggested that a motivation behind sperm donation may be to confirm one's fertility (Jadva et al., 2011). As such, the *anxiety towards discovering a fertility problem* may promote donation.

The donation process may also elicit feelings of disgust. Disgust is likely to be elicited when the body or soul are contaminated (Rozin et al., 1999). As such, disgust may be felt towards different aspects of the donation process. For example, the idea of masturbating

in a clinic is a concern for male donors (Cook & Golombok, 1995). Similarly, the medical procedures involved with egg donation may result in women feeling disgust towards this process. Disgust deters health behaviours, such as organ donation (O'Carroll et al., 2011) and bowel screening (O'Carroll et al., 2015). Therefore, this disgust may deter sperm and egg donation.

The Present Study

Although the research above suggests these emotions may be felt by sperm and egg donors, there is relatively little research assessing the extent to which these emotions predict donation. Despite the fact that positive emotions have been found to promote blood (Ferguson et al., 2012a) and organ donation (Morgan et al., 2008; O'Carroll et al., 2011), and the fact that pride has been found to be elicited through sperm and egg donation (Kenney & McGowan, 2010; Van den Broeck et al., 2012), to our knowledge, there is little research assessing whether pride predicts sperm and egg donation. Similarly, there has been little research assessing whether anxiety and disgust predict donation. Therefore, the aim of the present research was to enhance this body of literature by assessing the extent to which these emotions uniquely predict sperm (Study 1) and egg donation (Study 2).

Study 1

In Study 1, we assessed the extent to which emotions (pride, anxiety and disgust) predict sperm donation in a sample of potential donors. We also measured altruism and social-cognitive variables (attitude, subjective norm, perceived control and self-efficacy) to see whether the emotions predicted sperm donation over and above these more traditional factors. We assessed the extent to which these variables predicted men's intentions to become a sperm donor and information seeking behaviour. In this study, information seeking behaviour related to whether they requested more information about becoming a sperm donor.

Method

      Participants and design. Ethical approval for this study was obtained from the authors' institutional ethics committee. Participants were recruited for this online study via social media websites, online forums, course credit systems and emails to university staff and students. To take part, participants were required to be male, aged 18-40 years and live in the UK. Participants were not eligible to take part if they currently had a sexually transmitted infection or had a reason to believe they were ineligible to be a sperm donor (e.g., infertile, had serious physical or mental disability). These inclusion and exclusion criteria were included to make sure that participants were eligible to be sperm donors in the UK. We aimed to recruit a minimum of 135 participants (i.e., 15 per predictor variable)[1]. A total of 180 participants started the study. There were 41 participants removed from the dataset because they did not complete the study. A further participant was removed because they withdrew their consent after completing the study. Therefore, the final sample consisted of 138 men, aged 18-40 years ($M = 23.25$, $SD = 5.83$). Participants were most likely to be single ($n = 71$, 51.45%), students ($n = 93$, 67.39%), White ($n = 128$, 92.75%) and were unlikely to have children ($n = 118$, 85.51%). Finally, participants were unlikely to have previous donated or tried to donate sperm ($n = 132$, 95.65%).

      The study used a cross-sectional design. The predictor variables were altruism, the social cognitive variables (attitude, subjective norm, perceived control and self-efficacy) and the emotions (pride, anxiety towards the process, anxiety towards discovering a fertility problem and disgust). Whether or not the participant had previously tried to donate sperm was a covariate. The first outcome variable was intention to be a sperm donor (sperm donation intention). The second outcome variable was whether the participant requested more information about sperm donation (information seeking behaviour).

Materials and procedure. After giving consent, participants completed some demographic measures. Following this, *past donation* was assessed by asking participants if they had ever donated or tried to donate sperm to a sperm bank (no versus yes). Next, participants read some information about sperm donation to ensure they knew about the sperm donation process. This information described the shortage of sperm donors, the eligibility criteria and the process of donating sperm. It also described laws around sperm and egg donation that allow the offspring to trace their biological parents, but that the donor was unable to trace the offspring. Next, the following measures were completed. All items were rated on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*).

The three *attitude* items were: 'Sperm donation is important/beneficial/honourable' (α = .76). There were three *subjective norm* items: 'People who are important to me (i.e., friends and family) support sperm donation/would encourage me to donate my sperm/think sperm donation is important' (α = .84). The perceived control and self-efficacy items were based on previous research (Armitage & Conner, 1999). The three *perceived control* items were: 'I have control over whether or not I can donate my sperm', 'I am able to choose whether or not I donate my sperm' and 'I am able to determine whether or not I donate my sperm' (α = .76). The three *self-efficacy* items were: 'I am confident that I will be able to donate my sperm', 'I am certain that I will be able to donate my sperm' and 'I will be able to donate my sperm' (α = .87).

Altruism was assessed using 5-items used in previous research (Ferguson et al., 2012b). These items included: 'I prefer working toward my own well-being than toward the wellbeing of others' (reverse scored), 'It is important to me that I help others' and 'I think it is important to help the poor and the needy' (α = .73).

Six items assessed *anxiety towards the process*. These included: 'Visiting a sperm clinic would make me feel uncomfortable', 'If I donate my sperm I would be anxious that

people may find out that I was a donor' and 'I would feel embarrassed about visiting a sperm clinic' ($\alpha = .92$). Three items assessed the *anxiety towards discovering fertility problems*: 'I am worried/anxious/concerned that a clinic may find a problem with my sperm' ($\alpha = .97$). The three *disgust* items were: 'Sperm donation is disgusting', 'The thought of donating my sperm makes me feel disgust' and 'Sperm donation is gross' ($\alpha = .89$).

Pride was assessed with six items. Three items were adapted from previous blood donation research (Evans & Ferguson, 2014; Ferguson et al., 2012a, 2012b): 'If I were to donate my sperm I would feel good about myself', 'Donating my sperm would make me feel good about myself' and 'If I were to donate my sperm I would feel like a good person'. This scale also included an additional three items: 'Donating sperm would make me feel proud', 'Becoming a sperm donor would make me feel proud' and 'I would feel proud to be a sperm donor' ($\alpha = .94$)[2].

Sperm donation *intention* was assessed using three items: 'I will try/want/intend to become a sperm donor' ($\alpha = .94$). Finally, we measured *information seeking behaviour*. Participants were asked whether they would like more information about sperm donation and informed that if they selected yes they would receive more information at the end of the study. We then assessed whether or not the participant wanted more information (yes versus no).

Statistical analysis. First, we conducted correlation analyses to assess the association between the social-cognitive, emotion. altruism and past donation variables with sperm donation intention and information seeking behaviour. Next, we conducted a linear regression analysis to assess the extent to which each of the variables uniquely predicted sperm donation intention. Finally, binary logistic regression analysis was used to assess the extent to which the variables predicted the binary behavioural measure (no = 0 and yes = 1). In both regression analyses past donation, altruism and the social-cognitive variables were entered

into the model in the first step and the emotions were entered into the model in the second step. This allowed us to test whether the emotions improved the predictive power of the model.

Results

   Associations between variables. First, we assessed the association between the variables. Sperm donation intention was positively associated with attitude, subjective norm, self-efficacy, altruism, past behaviour, pride and the anxiety towards discovering a fertility problem (Table 1). Sperm donation *intention* was negatively predicted by the anxiety towards the process and disgust. *Information seeking behaviour* was positively predicted by subjective norm, altruism, pride and sperm donation intention. By contrast, information seeking behaviour was negatively predicted by anxiety towards the process and disgust.

   Predicting sperm donation intention. Next, a linear multiple regression analysis was conducted to determine the unique predictive power of the predictors on sperm donation intention. Altruism, past behaviour and the social-cognitive variables were entered into the model in Step 1 and the emotions were entered in Step 2. Step 1 accounted for a significant proportion of the variance ($R^2 = .39$, $F(6, 131) = 13.97$, $p < .001$). In this step, sperm donation intention was positively predicted by attitude, subjective norm, self-efficacy and past donation (Table 2, Step 1). Step 2 also accounted for a significant proportion of the variance ($R^2 = .53$, $F(10, 127) = 14.54$, $p < .001$). Importantly, the inclusion of the emotion variables in Step 2 significantly increased the predictive power of the model ($R^2_{change} = .14$, $F(4, 127) = 9.78$, $p < .001$). After including the emotions attitude and subjective norm became non-significant predictors of intention (Table 2, Step 2). Self-efficacy and past donation remained significant predictors of intention. With regards to the emotions, sperm donation intention was positively predicted by pride and the anxiety towards discovering a fertility problem. By contrast, the anxiety towards the process negatively predicted intention.

Importantly, the lowest tolerance value (.40) was greater than .20, suggesting the data was not biased by multicollinearity (Menard, 1995). These results imply that it is important to account for the role of emotions on sperm donation intention, particularly pride, the anxiety towards the process and the anxiety towards discovering a fertility problem.

Predicting information seeking behaviour. The majority of participants did not want any additional information about sperm donation (i.e., information seeking behaviour; n = 96, 69.57%). Next, we assessed the extent to which the variables uniquely predicted information seeking behaviour using a logistic regression analysis. Altruism, past donation and the social-cognitive models were entered into the analysis in Step 1 and the emotions were entered in Step 2. Step 1 accounted for a significant proportion of the variance in information seeking behaviour (Nagelkerke pseudo-R^2 = .14, p = .026). In this model, information seeking behaviour was positively predicted by subjective norm and altruism (Table 3, Step 1). By contrast, self-efficacy negatively predicted information seeking behaviour. Step 2 accounted for a significant amount of variance (Nagelkerke pseudo-R^2 = .36, p < .001 for step and model). In this model, subjective norm and altruism became non-significant predictors (Table 3, Step 2). Interestingly, perceived control was a significant positive and self-efficacy was a significant negative predictor of information seeking behaviour. With regards to the emotions, pride and the anxiety towards discovering a fertility problem positively and the anxiety towards the process negatively predicted information seeking behaviour. These results suggest that information seeking behaviour is promoted by pride and the anxiety towards discovering a fertility problem, but deterred by the anxiety towards the process of donating.

Post hoc power analysis. Post hoc power analysis was conducted to determine whether the study was adequately powered. The aim of the study was to assess the extent to which emotions uniquely predict sperm donation. Therefore, the power analysis tested

whether there was sufficient power to test the R^2 change in the linear regression model following the inclusion of the four emotion variables. This analysis was conducted in G*Power (Version 3, Faul, Erdfelder, Lang, & Buchner, 2007). The analysis revealed sufficient power to find a significant effect (power = 0.9998), with a medium effect size (f^2 = .30), an alpha value of .05 and a sample size of 138.

Discussion

In this study, we demonstrated the role of emotions in promoting and deterring sperm donation. Pride positively predicted men's willingness to donate their sperm and information seeking behaviour. By contrast, the anxiety towards the process of donation negatively predicted willingness to donate and information seeking behaviour. The anxiety towards discovering a fertility problem *positively* predicted sperm donation intention and information seeking behaviour. As mentioned above, this is likely to reflect the fact that men may try to confirm their fertility by donating their sperm (Jadva et al., 2011). Importantly, these results suggest that emotions are reliable predictors of sperm donation intention and information seeking.

Previous research has suggested that emotions are more likely to predict blood and organ donation than traditional social-cognitive factors (Ferguson et al., 2012a, 2012b; Morgan et al., 2008; O'Carroll et al., 2011). This study extended these findings to sperm donation. Indeed, the social-cognitive variables were less likely than the emotions to predict sperm donation intention and information seeking behaviour. For example, although subjective norm predicted intention, it did not predict information seeking behaviour. Similarly, although perceived control predicted information seeking behaviour, it did not predict intention. Interestingly, self-efficacy positively predicted intention, but negatively predicted information seeking behaviour. This discrepancy is likely to reflect the fact that people high in self-efficacy are likely to be aware of the donation process. This is because the

absence of this awareness would make them unlikely to have confidence in their ability to donate. However, this awareness may make people high in self-efficacy less likely to seek additional information about donation. As such, high self-efficacy is likely to reduce information seeking behaviours. Therefore, such people may be willing to donate, but unlikely to seek additional information about donation. Although these findings are important, further research was needed to assess the extent to which they could be extended into other areas of donation, such as women's willingness to become an egg donor.

Study 2

The aim of Study 2 was to assess the extent to which emotions promote and deter egg donation. Based on Study 1, we assessed altruism, social-cognitive variables (attitude, subjective norm, perceived control and self-efficacy) and the emotions towards egg donation (pride, anxiety towards the process, anxiety towards discovering a fertility problem and disgust). The outcome variables were egg donation intentions and information seeking behaviour.

Method

Participants and design. We obtained ethical approval from the authors' institutional ethics committee. Participants were recruited via adverts on online forums and social media websites, emails to staff and students within the university, and via a course credit system. To take part participants had to be female, between 18-35 years and live in the UK. Participants were asked not to take part if they had any genetic conditions or infections that could be passed on to offspring or an egg recipient. This inclusion and exclusion criteria was used to ensure all participants were eligible to be egg donors. We aimed to recruit a minimum of 135 participants (i.e., 15 per predictor), but over-recruited to account for attrition and withdrawal[1]. A total of 205 women started this survey. However, we removed 11 participants who failed to complete the study and 1 participant who was over 35 years. Therefore, the

final sample contained 193 women, aged 18-35 years ($M = 23.39$, $SD = 5.54$). Participants were most likely to be single ($n = 100$, 51.81%), White ($n = 179$, 92.75%), students ($n = 136$, 70.47%) and unlikely to have children ($n = 151$, 78.24%). Participants were unlikely to have tried to donate their eggs ($n = 186$, 96.37%).

The study used a cross-sectional design. In line with Study 1, the predictor variables were altruism, social-cognitive variables and the emotions. Past donation was included as a covariate. There were two outcome variables: egg donation intention and information seeking behaviour. In line with Study 1, information seeking behaviour was assessed by measuring whether the participant wanted more information about egg donation (yes versus no).

Materials and procedure. After giving consent, participants completed some demographic measures (see above). Following this *past donation* was assessed by asking participants if they had ever tried to donate their eggs. Next, participants were presented with information about egg donation. This information stated the importance of egg donation, the eligibility requirements and the process of becoming an egg donor. This information also stated that according to UK law children who are conceived through donation are allowed to trace their biological parents, but that donors do not have the legal right to trace their children. Participants then rated altruism, social-cognitive (attitude, subjective norm, perceived control and self-efficacy) and emotion variables (anxiety towards the process, anxiety towards discovering a fertility problem, disgust and pride), and egg donation intention. In most cases, the measures used in Study 2 were the same as those used in Study 1, with references to sperm donation and donors replaced with references about egg donation and donors. The only difference was that the anxiety towards the process variable included three additional items: 'I am worried/anxious/afraid that egg donation would damage my fertility'. Given that egg donation may result in medical issues, it was important that the scale incorporated such concerns. Therefore, these additional items were added to ensure that the

anxiety towards the process measure assessed fertility problems that could stem from the donation process. In line with Study 1, the items produced a reliable measure for the attitude ($\alpha = .86$), subjective norm ($\alpha = .78$), perceived control ($\alpha = .81$), self-efficacy ($\alpha = .93$), altruism ($\alpha = .72$), anxiety towards the process ($\alpha = .84$), anxiety towards discovering a fertility problem ($\alpha = .96$), disgust ($\alpha = .90$), pride ($\alpha = .97$) and intention items ($\alpha = .94$). Finally, we measured information seeking behaviour by asking participants if they would like more information about becoming an egg donor (yes versus no). Participants were informed if they selected 'yes' they would receive this information at the end of the study.

Statistical analysis. Correlation analyses were conducted to assess the association between the variables. Linear regression analysis was then used to assess the extent to which the emotions uniquely predicted egg donation intention after accounting for the control variables. Binary logistic regression was used to assess the variables that predicted information seeking behaviour. In both regression analyses past donation, altruism and the social-cognitive variables were entered into the model in Step 1 and the emotions were included in Step 2.

Results

Associations between variables. Initially, correlation analyses were conducted to assess the association between the variables. Egg donation intention was positively predicted by attitude, subjective norm, self-efficacy, altruism, past donation and pride (Table 4). Egg donation intention was negatively predicted by the anxiety towards the process and disgust. Information seeking behaviour was positively predicted by attitude, subjective norm, pride and intention. No other variables predicted information seeking behaviour.

Predicting egg donation intention. Next, we conducted a linear regression analysis to assess the extent to which the variables predicted egg donation intention. Step 1 accounted for a significant proportion of variance in egg donation intention ($R^2 = .34$, $F(6, 186) = 15.59$,

p < .001). In this model, egg donation intention was positively predicted by attitude, subjective norm, self-efficacy, altruism and past donation (Table 5, Step 1). Step 2 accounted for a significant proportion of the variance in egg donation intention (R^2 = .49, $F(10, 182)$ = 17.21, *p* < .001) and significantly improved the predictive power of the model (R^2_{change} = .15, $F(4, 182)$ = 13.41, *p* < .001). In this step attitude, subjective norm, altruism and past donation became non-significant predictors of egg donation intention (Table 5, Step 2). Self-efficacy remained a significant predictor. With regards to the emotions, pride positively and the anxiety towards the process negatively predicted egg donation intention. Importantly, the lowest tolerance value was .48, indicating the data was not bias by multicollinearity (Menard, 1995). These results reflect the fact that the anxiety towards the process is likely to serve as a barrier to egg donation intention, while pride is likely to promote egg donation intention.

Predicting information seeking behaviour. The majority of participants did not want additional information about egg donation (i.e., information seeking behaviour, *n* = 133, 68.91%). Next, we assessed the variables that predicted information seeking behaviour using logistic regression. Step 1 explained a significant proportion of the variance in information seeking behaviour (Nagelkerke pseudo-R^2 = .11, *p* = .012). In this model, subjective norm positively predicted information seeking behaviour (Table 6, Step 1). All other variables were non-significant predictors of information seeking behaviour. Including the emotions (Step 2) did not improve the predictive power of the model (Nagelkerke pseudo-R^2 = .12, *p* = .079 for model and *p* = .971 for step). None of the emotions predicted information seeking behaviour (Table 6, Step 2). Moreover, subjective norm became a non-significant predictor.

Post hoc power analysis. In line with Study 1, post hoc power analysis tested whether there was sufficient power to find a significant increase in R² for the linear regression model following the inclusion of the four emotion variables into the model. This analysis was conducted in G*Power (Version 3, Faul et al., 2007). This revealed the analysis

was sufficiently powered (power = 0.999998), based on a medium effect size (f^2 = .29), an alpha of .05 and a sample size of 193.

Discussion

In line with Study 1, women's willingness to donate their eggs was negatively predicted by the anxiety towards the process and positively predicted by pride, thereby suggesting emotions may influence women's intentions to become an egg donor. However, in contrast to Study 1, the anxiety towards discovering a fertility problem did not predict egg donation intention. This may be due to differences in the sperm and egg donation process. Men are able to provide numerous sperm samples without risking their fertility. Women, on the other hand, have a limited supply of eggs. As a result, egg donation reduces the number of opportunities that women have to produce children in the future. Given that egg donation reduces women's supply of eggs, using this to confirm fertility may be counter-productive.

In line with Study 1 and previous research (e.g., Morgan et al., 2008; O'Carroll et al., 2011), the social-cognitive variables were less likely than the emotions to predict egg donation intention. Indeed, self-efficacy was the only social-cognitive variable to reliably predict egg donation intention across both studies. As such, this supports previous research in suggesting that bodily donation is likely to be driven by emotional factors.

In contrast to Study 1, none of the variables uniquely predicted information seeking behaviour. This discrepancy may stem from differences between the sperm and egg donation process. Given that women have a limited number of eggs, they may put greater consideration into converting their willingness to donate into more concrete actions, such as seeking information about how to become a donor. This may have resulted in the social-cognitive and emotion variables being more likely to predict information seeking behaviour in Study 1 than Study 2.

General Discussion

The aim of this research was to assess the role of emotions in promoting sperm and egg donation. We found that sperm donation intention and information seeking behaviour were predicted by pride and anxiety. We also found that pride and anxiety predicted egg donation intention, but not information seeking behaviour. This supports previous research in blood (Ferguson et al., 2012a, 2012b) and organ donation (Morgan et al., 2008; O'Carroll et al., 2011) in demonstrating the importance of assessing the role of emotional factors on donation. Although disgust has been found to deter health behaviours (O'Carroll et al., 2015), we found that disgust did not uniquely predict sperm or egg donation. This may reflect the fact that the mean level of disgust was low. Importantly, pride and anxiety predicted donation intention when controlling for the social-cognitive factors, demonstrating the robustness of their predictive power. Therefore, we enhanced previous research by demonstrating the role of pride and anxiety in influencing sperm and egg donation.

Altruism is often regarded as a key determinant of gamete donation (Purewal & van den Akker, 2009b; Van den Broeck et al., 2012) and is thought to be an important value in donation systems (Nuffield Council on Bioethics, 2011). However, we found that altruism was less likely to predict sperm and egg donation than the emotions. Our findings may be due to the fact that we assessed a pure form of altruism in which help is provided because of concern for others (Ferguson et al., 2012b). By contrast, blood donation research has suggested that donation behaviours may be more likely to be driven by impure altruistic motives that may partly reflect the desire to help in order to feel good about oneself (Evans & Ferguson, 2015). We argue that this impure form of altruism may also predict sperm and egg donation, as demonstrated by the predictive power of pride. Therefore, more impure forms of altruism may be likely to promote sperm and egg donation.

This research has important implications for the literature. Numerous psychological models suggest behaviour is predicted by social-cognitive factors (for a review, see Armitage & Conner, 2000). However, in this research we demonstrated that, in contrast to the emotions, social-cognitive variables were less reliable predictors of donation, both within and between the two studies. As such, this supports research assessing other forms of bodily donation (e.g., Morgan et al., 2008; O'Carroll et al., 2011). Importantly, there is a growing body of research demonstrating the importance of emotions on other behaviours (Sandberg & Conner, 2008), such as cervical screening (Sandberg & Conner, 2009) and testicular self-examination (Shepherd et al., 2016). Therefore, in line with other researchers (e.g., Conner & Armitage, 1998; Sniehotta, Presseau, & Araújo-Soares, 2014), we argue that it is important for psychological models to consider the role of emotions on behaviour.

These findings also have implications for sperm and egg donation interventions. Based on this research, it could be argued that interventions should target emotions in order to promote sperm and egg donation. Indeed, in the context of blood donation, Ferguson et al. (2012b) suggested that emphasising the positive feeling associated with donation may improve donation rates. A similar strategy could be used here to motivate people to become a donor (e.g., 'Be proud, be a sperm/egg donor'). However, there are a number of limitations to this research, suggesting that further research is needed prior to the implementation of such interventions. First, the studies used a cross-sectional design, preventing causality from being inferred. Therefore, further experimental research is needed to determine the effect of the emotions on sperm and egg donation. Second, in both studies the majority of the sample were students. Although a large proportion of sperm donors are likely to be students (Paul, Harbottle, & Stewart, 2006), this is less true for egg donors (Pennings et al., 2014). Therefore, further research is needed in samples of the general public to test whether these

findings can be generalised to other populations prior to the implementation of this intervention.

In conclusion, we demonstrated the role of emotions in promoting and deterring sperm and egg donation. Feeling pride positively predicted people's willingness to become a sperm or egg donor. By contrast, feeling anxiety towards the process negatively predicted people's willingness to become a donor. Importantly, these emotions predicted donation after controlling for social-cognitive variables, past donation and altruism. In line with blood and organ donation research (Ferguson et al., 2012a, 2012b; Morgan et al., 2008; O'Carroll et al., 2011), this enhances previous research in the sperm and egg donation literature, which has focused on social-cognitive factors, by demonstrating the role of emotions.

Endnotes

[1]   Initially, we tested a model containing nine predictor variables. However, a reviewer suggested it was important to control for past donation. Therefore, ten variables were included in the final analysis.

[2]   Originally the first three items formed a 'warm glow' scale (Ferguson et al., 2012a, 2012b) and the second three items were used to indicate pride. However, these two concepts were highly correlated in Studies 1 ($r = .77, p < .001$) and 2 ($r = .83, p < .001$). This was unsurprising given the similarity between the two constructs. Therefore, these two scales were combined to create a single pride scale.

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Table 1. Descriptive and intercorrelations between variables (Study 1).

	M (SD)	1	2	3	4	5	6	7	8	9	10	11	12
1) Attitude	3.81 (0.67)	-											
2) Subjective norm	2.98 (0.73)	.51***	-										
3) Perceived control	4.28 (0.67)	.09	-.04	-									
4) Self-efficacy	3.69 (0.91)	.38***	.20*	.44***	-								
5) Altruism	3.83 (0.60)	.04	.07	.08	.06	-							
6) Past donation	-	.13	.17*	.05	.19*	.17*	-						
7) Pride	3.36 (0.83)	.71***	.43***	.08	.37***	.08	.22**	-					
8) Anxiety process	2.87 (0.97)	.01	-.15	.12	.04	-.10	-.03	-.09	-				
9) Anxiety problem	2.98 (1.17)	.17*	.09	-.19*	-.03	-.09	.03	.22*	.30***	-			
10) Disgust	1.80 (0.76)	-.36***	-.26**	.01	-.21*	-.17	-.09	-.31***	.49***	.04	-		
11) Intention	2.62 (1.00)	.43***	.40***	.03	.37***	.21*	.40***	.60***	-.24**	.17*	-.29**	-	
12) Information seeking behaviour	-	.05	.17*	.03	-.12	.18*	.01	.23**	-.29**	.10	-.24**	.32***	-

* = $p < .05$, ** = $p < .01$, and *** = $p < .001$

Notes. Given that information seeking behaviour is a binary variable (no = 0 and yes = 1), the correlations with the continuous variables are point-biserial correlations. N = 138 for all the correlation analyses.

Table 2. Linear regression assessing variables predicting sperm donation intention (Study 1).

	Step 1		Step 2	
	B (SE)	β	B (SE)	β
Attitude	0.32 (0.13)	.22*	-0.03 (0.14)	-.02
Subjective norm	0.25 (0.11)	.18*	0.16 (0.10)	.11
Perceived control	-0.17 (0.12)	-.11	-0.08 (0.11)	-.05
Self-efficacy	0.27 (0.09)	.24**	0.23 (0.08)	.21**
Altruism	0.22 (0.12)	.13	0.19 (0.11)	.11
Past donation	1.37 (0.35)	.28***	1.15 (0.31)	.24***
Pride	-	-	0.47 (0.11)	.39***
Anxiety process	-	-	-0.25 (0.08)	-.24**
Anxiety problem	-	-	0.12 (0.06)	.14*
Disgust	-	-	0.06 (0.10)	.05
R^2	.39***		.53***	
R^2_{change}	-		.14***	

$* = p < .05$, $** = p < .01$, and $*** = p < .001$

Table 3. Logistic regression predicting sperm donation information seeking behaviour (Study 1).

	Step 1		Step 2	
	B (SE)	Odds ratio (Lower CI, upper CI)	B (SE)	Odds ratio (Lower CI, upper CI)
Attitude	0.02	1.02	-0.97	0.38
	(0.36)	(0.50, 2.08)	(0.56)	(0.13, 1.13)
Subjective norm	0.76	2.15*	0.54	1.71
	(0.36)	(1.06, 4.35)	(0.39)	(0.80, 3.64)
Perceived control	0.41	1.51	0.79	2.20*
	(0.33)	(0.79, 2.90)	(0.38)	(1.03, 4.66)
Self-efficacy	-0.60	0.55*	-0.84	0.43**
	(0.27)	(0.33, 0.93)	(0.32)	(0.23, 0.81)
Altruism	0.74	2.10*	0.66	1.93
	(0.38)	(1.01, 4.40)	(0.42)	(0.85, 4.36)
Past donation	-0.20	0.82	-0.51	0.60
	(0.96)	(0.12, 5.39)	(0.98)	(0.09, 4.12)
Pride	-	-	1.09	2.97*
			(0.43)	(1.28, 6.90)
Anxiety process	-	-	-0.75	0.47*
			(0.33)	(0.25, 0.90)
Anxiety problem	-	-	0.47	1.60*
			(0.24)	(1.01, 2.53)
Disgust	-	-	-0.50	0.61
			(0.40)	(0.28, 1.32)
Pseudo-R^2	.14		.36	
Model χ^2	14.30*		40.47***	
Step χ^2	-		26.17***	

$* = p < .05$, $** = p < .01$, and $*** = p < .001$

Table 4. Descriptive and intercorrelations between variables (Study 2).

	M (SD)	1	2	3	4	5	6	7	8	9	10	11	12
1) Attitude	4.13 (0.76)	-											
2) Subjective norm	3.09 (0.63)	.53***	-										
3) Perceived control	4.51 (0.64)	.01	.06	-									
4) Self-efficacy	3.31 (0.95)	.20**	.24**	.34***	-								
5) Altruism	3.91 (0.55)	.20**	.15*	.003	-.05	-							
6) Past donation	-	.16*	.18*	-.11	-.13	.19*	-						
7) Pride	3.66 (0.97)	.66***	.48***	.06	.32***	.26***	.16*	-					
8) Anxiety process	2.47 (0.71)	-.08	-.12	-.14	-.01	-.19**	-.21**	-.07	-				
9) Anxiety problem	3.10 (1.11)	.13	.11	-.11	-.04	.05	-.02	.18*	.40***	-			
10) Disgust	1.33 (0.55)	-.32***	-.18*	-.13	-.07	-.24**	-.08	-.28***	.38***	-.06	-		
11) Intention	2.56 (0.99)	.46***	.40***	.04	.27***	.29***	.24**	.64***	-.23**	.07	-.29**	-	
12) Information seeking behaviour	-	.19**	.24**	.03	.11	.14	.11	.21**	-.05	.04	-.07	.46***	-

* = $p < .05$, ** = $p < .01$, and *** = $p < .001$.

Notes. Given that information seeking behaviour is a binary variable (no = 0 and yes = 1), the correlations with the continuous variables are point-biserial correlations. N = 192 for correlation analyses with information seeking behaviour. N = 193 for all other correlation analyses.

Table 5. Linear regression assessing variables predicting egg donation intention (Study 2).

	Step 1		Step 2	
	B (SE)	β	B (SE)	β
Attitude	0.36 (0.09)	.27***	-0.01 (0.10)	-.01
Subjective norm	0.23 (0.11)	.15*	0.11 (0.10)	.07
Perceived control	-0.05 (0.10)	-.04	-0.08 (0.09)	-.05
Self-efficacy	0.23 (0.07)	.22**	0.13 (0.06)	.13*
Altruism	0.36 (0.11)	.20**	0.17 (0.10)	.09
Past donation	0.82 (0.33)	.16*	0.53 (0.30)	.10
Pride	-	-	0.52 (0.08)	.51***
Anxiety process	-	-	-0.22 (0.09)	-.15*
Anxiety problem	-	-	0.03 (0.06)	.03
Disgust	-	-	-0.07 (0.11)	-.04
R^2	.34***		.49***	
R^2_{change}	-		.15***	

$* = p < .05$, $** = p < .01$, and $*** = p < .001$

Table 6. Logistic regression for variables predicting egg donation information seeking

behaviour (Study 2).

	Step 1		Step 2	
	B (SE)	Odds ratio (Lower CI, upper CI)	B (SE)	Odds ratio (Lower CI, upper CI)
Attitude	0.21 (0.28)	1.23 (0.71, 2.14)	0.13 (0.33)	1.14 (0.60, 2.16)
Subjective norm	0.64 (0.32)	1.90* (1.02, 3.54)	0.61 (0.32)	1.84 (0.98, 3.46)
Perceived control	-0.02 (0.27)	0.98 (0.58, 1.66)	0.001 (0.27)	1.00 (0.59, 1.71)
Self-efficacy	0.19 (0.20)	1.21 (0.82, 1.78)	0.16 (0.21)	1.17 (0.78, 1.75)
Altruism	0.44 (0.34)	1.56 (0.80, 3.03)	0.42 (0.35)	1.52 (0.76, 3.05)
Past donation	0.61 (0.87)	1.84 (0.34, 10.02)	0.59 (0.88)	1.81 (0.32, 10.24)
Pride	-	-	0.15 (0.25)	1.17 (0.71, 1.91)
Anxiety process	-	-	0.02 (0.29)	1.02 (0.57, 1.82)
Anxiety problem	-	-	0.04 (0.17)	1.04 (0.74, 1.45)
Disgust	-	-	0.08 (0.37)	1.09 (0.53, 2.24)
Pseudo-R^2	.11		.12	
Model χ^2	16.25*		16.78	
Step χ^2	-		0.53	

$* = p < .05$, $** = p < .01$, and $*** = p < .001$