

Being Transgender: Effects on sex atypicality and well-being

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Definitions of Terms

Transgender – refers to an individual who indicates that their birth sex is different to their gender. For example, someone who has a birth sex of female, but a gender identity of male, is female-to-male transgender.

Cisgender – refers to an individual who indicates that their birth sex is the same as their gender. For example, someone who has a birth sex of male, and a gender identity of male, is cisgender.

Sex atypicality – is when an individual's behaviour and interests are not typical of their birth sex, i.e., someone with a birth sex of male but who behaves in a more typically feminine way. For all participants in the present research sex atypicality is based on their birth sex, not their gender.

Gender dysphoria – is a condition commonly associated with being transgender. It can often bring with it a lot of distress and strong, persistent feelings of being the opposite sex. Gender dysphoria is different from sex atypicality. It relates to an incongruence between an individual's birth sex and gender identity, whilst sex atypicality describes an individual's behaviour as being different from the behaviour typically associated with their birth sex.

Birth sex – is the sex an individual was assigned at birth; sometimes considered “biological sex”.

LGBT – is a commonly used acronym for lesbian, gay, bisexual, and transgender individuals

Sexual minority – in the present research, this refers to participants who have indicated a sexual orientation that is not heterosexual; this includes bisexual and homosexual.

Sexual orientation – in the present research, this is the self-reported orientation to a particular gender. For all participants, this is based on their gender identity, not their birth sex.

Gender Identity – Is used in the present research to define the factor of whether participants are transgender or cisgender.

Abstract

The present research is split into two studies. **Study 1** investigated the effect of sexual orientation and being transgender or cisgender on sex atypicality. Sex atypicality refers to behaving in a way that is not typical for one's birth sex. People who are cisgender, and lesbian, gay, or bisexual (LGB), are more sex atypical than those who are heterosexual. Less is known about the sex atypicality of transgender groups, particularly in comparison to cisgender populations. In this study, sex atypicality was measured through observer ratings of participant photographs, and self-report. It was predicted that sexual orientation, and being transgender or cisgender, would significantly affect sex atypicality. The results partially supported this. Transgender participants were rated, and reported, as being highest in sex atypicality. This difference between cisgender and transgender participants was found to emerge as early as 2 years old. However, consistent significant effects of sexual orientation were not found. **Study 2** compared the well-being of cisgender and transgender groups, and the effect of sex atypicality on their well-being. LGBT populations have, on average, lower well-being than non-LGBT people. Less is known about how LGBT populations compare to each other, for example, how do cisgender non-straight people compare to transgender groups? Furthermore, sex atypicality negatively affects the well-being of homosexual cisgender men, and women, but this has not been investigated in transgender people. Study 2 predicted that (1) well-being would to be lowest in transgender participants, and lower in cisgender sexual minorities, than cisgender heterosexual people; and (2) higher sex atypicality would have a negative effect on well-being, particularly for minority groups. Prediction (1) was partially supported, with transgender participants having the lowest well-being than cisgender, however, differences in their sexual orientation had no robust effects on their well-being. Prediction (2) was partially supported also, with higher sex atypicality correlating with lower well-being for some groups, but not particularly so for minority groups including transgender participants.

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Introduction

Overview

Transgender people live and identify as a gender that is different to their birth sex (Levy, Crown, & Reid, 2003). An example of a person who is transgender would be someone with a birth sex of male, but who identifies as female. A diagnosis of gender dysphoria often accompanies being transgender, and gender dysphoria is described as a persistent and strong discomfort with one's biological sex (Zucker, Lawrence, & Kreukels, 2016). There is no specific test to diagnose gender dysphoria; instead it is determined through a series of set criteria that include: the presence of incongruence between one's expressed gender and their sex characteristics; and a strong want to be accepted as a gender different to the one they have been assigned (American Psychiatric Association, 2013). The presence of gender dysphoria is a distinguishing factor between transgender and cisgender sexual minority people. A further distinction between these two groups is that being transgender is a factor of identity based on gender, not sexual orientation. That is not to say however that transgender people cannot also be of sexual minority, they can be lesbian, gay or bisexual, or any other sexual orientation. Yet, there is a lack of consistency within the literature as to what transgender people's sexual orientation is based on. Sometimes it is based on birth sex, and other times it is based on their gender identity. The present research will base sexual orientation on gender identity, not birth sex. This means that a female-to-male transgender participant who indicates a sexual attraction to women is defined as heterosexual (as he has a male gender and a preference for women). Similarly, a female-to-male transgender participant who indicates an attraction to men is defined as homosexual (because of their male gender, and a preference for men). The opposite is true for male-to-female transgender participants, with those who indicated an attraction to men being heterosexual, and those who indicated an attraction to women being homosexual.

With increased awareness, the transgender community is becoming more present in society, and there has been a rise recently in the number of referrals to NHS Gender Identity Clinics in the United Kingdom. Although exact figures of the amount of transgender people in the population are not known, the prevalence of being transgender is estimated to be around 0.3% in the US adult population (Gates, 2011). This is substantially lower in comparison to the estimated 3.5% of the population that is believed to be lesbian, gay or bisexual (Gates, 2011). There are indications that the occurrence of being a female-to-male transsexual is lower than being a male-to-female transsexual (Zucker, Lawrence, & Kreukels, 2016), though the reason for this occurrence remains unknown. These statistics on gender dysphoria are likely to be lower than the true figure, as they are commonly based on the number of patients treated at clinics; although it is likely that a lot of people never seek help or diagnosis, or do not have access to treatment. This could also explain why a higher estimate of transgender people is reported in comparison to the approximate number of people with gender dysphoria.

Although there have been theories put forward to explain the cause of gender dysphoria, the exact cause has not been proven. Despite this, there is support for the theory that exposure to increased or decreased levels of male or female sex hormones to the foetus, or during certain stages of childhood development, leads to gender dysphoria (Levy, Crown, & Reid, 2003) For example, increased exposure to male sex hormones to a female foetus at the stage of brain development are theorised to lead to a biologically female person with more masculine characteristics; this could then reach the threshold of cross-sex identification. These unusual hormone levels are thought to lead to an incongruence in the development of the brain and the genitals, causing certain people to have physical characteristics of their chromosomal sex, but brain structures of the opposite sex (Gender Identity Research and Education Society, 2008). This disparity between the development of the brain and the genitals can occur because they develop at different times of prenatal development; therefore, unusual exposure to certain levels of hormones at one stage, but not another,

could lead to a different developmental trajectory for the brain compared to the genitals (Zucker, Lawrence, & Kreukels, 2016). This could indicate a distinct and biological difference between sex and gender. In support of this, there are findings that certain brain structures in male-to-female transsexuals were similar to that of cisgender females, and this was not believed to be caused by the taking of cross-sex hormones (Kruijver, et al., 2000). Structural studies on female-to-male transsexuals have shown similar support for the theory, with more male-typical structures being found (Zucker, Lawrence, & Kreukels, Gender dysphoria in adults, 2016), and this occurs even in those who not started testosterone therapy (Rametti, et al., 2011). There is also support for there being strong heritable components to the development of gender dysphoria in twin studies (Coolidge, Thede, & Young, 2002). All of these findings point to a potential biological cause of gender dysphoria, as opposed to being down to socialisation, because they indicate pre-natal development factors that can impact behaviour and physical brain structures. To further support this hypothesis, it is important to investigate the development of transgender people during childhood and how this compared to cisgender people in childhood. Early behavioural differences between these populations would support a more biological cause of gender dysphoria, as parents are significantly more likely to give positive responses to sex-typical behaviours as compared to sex atypical behaviour (Fagot, 1978), thus indicating that strong sex atypical behaviour from an early age goes against socialisation. An example of this would be if sex atypicality measured in childhood is rated as significantly higher for transgender people, compared to cisgender.

Transgender and cisgender groups are distinguishable by the presence (or lack of) gender dysphoria and cross-sex identification, but a similarity between transgender and sexual minority cisgender populations is in their well-being. Both populations experience decreased well-being (Meyer, 2003; Newfield, Hart, Dibble, & Kohler, 2006), and some of the common reasons for this have previously been linked to stigmatisation (Kelleher, 2009) and lack of social support (Van Den Berghe, Dewaele, Cox, & Vincke, 2010), due to being of

sexual minority or transgender. Both mental and physical well-being are key factors in life and every day functioning, which means it is of importance that certain groups within society experience lower well-being. However, knowledge into the specific causes of decreased well-being among transgender people, and particularly, any difference between cisgender sexual minority people and transgender people, is lacking.

Sex Atypicality

Adherence to gender stereotypes and typical behaviours starts early in childhood, with children as young as two years old showing some ability to discriminate between gender-consistent, and gender-inconsistent, behaviours (Hill & Flom, 2007). Furthermore, children as young as preschool age show intergroup bias to their gender, as well as conforming to the stereotypes attached to being that gender (Ruble, Martin, & Berenbaum, 2007). Children also show a desire to align with members of the same gender, having a preference for those with the same gender as well as an increase in gender relevant activities (Martin & Ruble, 2004). These findings show that one's gender perception develops early in life and to go against this would likely make someone stand out. Despite this, not everyone adheres to these stereotypes, both in their early life and later on, with some behaving in atypical ways for their birth sex.

Sex atypicality refers to behaviour that is not traditionally seen as typical for one's birth sex, for example, someone who is biologically male behaving in a typically feminine way, and vice versa. In the present research, sex atypicality is defined with reference to birth sex rather than gender identity (which is different from an individual's birth sex for transgender participants). The recognition of sex atypicality is of importance to transgender people, as part of the criteria for diagnosing gender dysphoria is the persistent impression that one's feelings and reactions are typical of the opposite gender to their sex (American Psychiatric Association, 2013). For example, a child whose assigned sex is female, would fit

this criterion if they have typical reactions and feelings expected of someone who is male. Therefore, investigating outward behaviours and appearance could provide some indications about the development of gender behaviour, and identity, of transgender people. However, sex atypicality is not just relevant to transgender people; cisgender homosexual men and women are also particular populations who have been consistently shown to deviate from these typical behaviours.

It has previously been found that, during childhood, the majority of homosexual people were considered atypical for their gender by others (D'Augelli, Grossman, & Starks, 2008; Rieger, Linsenmeier, Gygax, & Bailey, 2008; Drummond, Bradley, Peterson-Badali, & Zucker, 2008), with pre-homosexual males often being called sissies, and pre-homosexual females often being called tomboys, because of their atypical behaviour (D'Augelli, Grossman, & Starks, 2006). Sex atypicality has, so far, more commonly been investigated using retrospective self-report measures, but Rieger et. al., (2008) used childhood home videos of pre-homosexual and pre-heterosexual children, which were rated on masculinity/femininity. This method reduces the problems involved with self-report, providing a potentially less subjective measure of behaviour. Pre-homosexual children were observed as being more sex atypical than pre-heterosexual children. Rieger et. al., (2008) also reported a correlation between rated childhood sex atypicality, and rated adulthood sex atypicality, indicating that sex-typed behaviour is at least a fairly consistent trait throughout life. The fact that these results apply to both childhood and adulthood, indicates that these differences emerge early and remain persistent through life, going against typically expected development through socialisation.

Although evidence has been found to show increased sex atypicality in homosexual people, as compared to heterosexual people, this behavioural pattern has not received as much attention in pre-transgender children and transgender adults. This is perhaps the case, as being lesbian, gay or bisexual, is more prevalent than being transgender (an estimated 3.5% compared to 0.3% respectively (Gates, 2011)). Furthermore, findings indicate that not all

sex atypicality is strong enough to reach the level of cross-gender identity or a diagnosis of gender dysphoria. So far, it has been more commonly associated with being a prerequisite to a queer identity, such as having a non-heterosexual orientation (Drescher, 2010), rather than related to gender identity in adulthood. This may be another reason to explain why sex atypicality is more researched in cisgender sexual minority populations.

A distinct separation between sexual orientation and being transgender or cisgender needs to be emphasised. Sexuality and gender identity are separate, but not mutually exclusive aspects of identity with any combination being possible. For example, an individual can be both transgender and homosexual, or transgender and heterosexual - as stated above, sexual orientation of transgender individuals is based on their present gender identity, not on their birth sex. One study investigated the effects of different sexual orientations on sex atypicality in a sample of female-to-male transgender men. Heterosexual female-to-male transsexuals (those attracted to females), reported increased sex atypicality (that is, masculinity) as compared to homosexual female-to-male transsexuals (those attracted to males) (Chivers & Bailey, 2000). This indicates that female-to-male transsexuals show corresponding behavioural differences, depending on their sexual orientation, as cisgender men, with homosexual men being more feminine on average than heterosexual men (Rieger, et. al., 2008).

Other research suggests that, in childhood, female-to-male and male-to-female transgender people both felt, and were told, that they were different from other children of the same birth sex (Grossman A. H., D'Augelli, Salter, & Hubbard, 2006). Gender dysphoria can be diagnosed in childhood, and these children have been found to display strong behavioural patterns and identification to the opposite sex, rejection of sex typical behaviour, and a preference for toys and role play of those of the opposite sex (Zucker & Bradley, 1995). Childhood cross-sex behaviour does not always reach the threshold of adulthood diagnosis of gender dysphoria, or to a later transgender identity; and distinct differences have been found between those who reach diagnostic threshold and those who don't. Children with

gender dysphoria and strong cross-sex behaviour that persisted into adulthood, indicated feeling that they were the opposite sex in childhood and that puberty brought on an increase in dislike and aversion to their bodies (Steensma, Biedmond, de Boer, & Cohen-Kettenis, 2011). However, children who showed some levels of sex atypicality, but who were not diagnosed with gender dysphoria, showed a *want* to be the opposite sex, rather than feeling that they *were* the opposite sex, with puberty often leading to increased body satisfaction and a desistance in cross sex behaviour. (Steensma, Biedmond, de Boer, & Cohen-Kettenis, 2011). These findings indicate that children who felt like the opposite sex (and were in this sense more likely transgender) were more sex atypical than those sex-atypical children who did not feel as strongly that they are the opposite sex. Yet, to what degree their levels of sex atypicality differed from each other and from cisgender groups, still needs investigation. Furthermore, when investigating sex atypicality, the focus is mainly on how it relates to participants' adulthood sexual orientation, not their gender identity, nor how the two can combine. It would be of importance to relate this atypicality to gender identity to investigate how gender behaviour potentially develops differently for transgender and cisgender people of the same assigned birth sex. This would allow an insight in to how early these differences may appear in terms of behaviour, identity and appearance, as well as how consistent they remain.

The onset of sex atypical behaviour among pre-transgender children is estimated to occur between the ages of 2-4 years old (Zucker & Bradley, 1995). This is substantially younger than the average age that people first identify as transgender, which is approximately 13 to 15 years old for male-to-female transsexuals, and female-to-male transsexuals, respectively (Grossman A. H., D'Augelli, Salter, & Hubbard, 2006). This indicates an early onset of behavioural differences, but a large difference between the onset of behavioural differences and the knowledge of one's identity. Many transgender people felt like there was something different about them long before they knew what it was, or how to describe it (Beemyn & Rankin, 2011). Due to this, before their transition many female-to-male transgender

individuals identified as lesbians, and many male-to-female women identified as cross-dressers. This is thought to be the case because these identities are more well-known and accessible than being transgender (Beemyn & Rankin, 2011). Because education on this subject for children and adolescents is lacking, transgender people may find out their identity, and the possibility of being transgender, by chance (Whittle, 2000).

The above-mentioned research suggests that childhood sex atypicality is linked to an adulthood homosexual sexual orientation. This sex atypicality still occurs, despite social pressure to conform to sex typical stereotypes (Ruble, Martin, & Berenbaum, 2007), indicating that it is not easily changed behaviour. Amongst the transgender people, high sex atypicality may indicate more typical development for their gender identity, rather than their assigned birth sex. This is because behaviour that would be classed as highly sex atypical among transgender individuals could be seen as being typical for people of the opposite birth sex, and thus typical for a transgender individual's gender identity. There is a lack of research into the transgender community as a whole, particularly when it comes to comparing them to other groups, such as those who are LGB but who are not transgender.

The present research aims to address this gap by exploring the sex atypicality of female-to-male transgender people and cisgender women, of differing sexual orientations, based on both self-reported and observer ratings of sex atypicality. It is predicted that female-to-male transgender participants will be rated, and report themselves, as being more sex atypical than cisgender women. Additionally, an effect of sexual orientation is expected in both cisgender and transgender groups. Heterosexual female-to-male transgender participants are predicted to be higher in sex atypicality than those who are of sexual minority; whereas, sexual minority cisgender women are predicted to be higher in sex atypicality than those who are heterosexual.

Well-being

A large body of research suggests that LGB populations have an increased prevalence of mental disorders as well as poorer physical well-being, in comparison to heterosexual people (Lick, Durso, & Johnson, 2013; Meyer, 2003). Moreover, sexual orientation is a critical risk factor for suicide (Grossman & D'Augelli, 2006), being twice as high amongst LGB groups as compared to heterosexual people (Semlyen, et al., 2008). Potential causes of this decreased well-being, as well as certain factors that can also increase well-being among the LGB population, have been investigated.

One such factor that affects well-being is perceived experience of stigmatisation because of sexual orientation, which has been linked to lower psychological well-being amongst sexual minority youth and adults (Baams, Beek, Hille, Zevenbergen, & Bos, 2013). Discrimination has also been linked to causing decreased well-being, with homosexual and bisexual people reporting increased experiences of discrimination as compared to heterosexual people, which, in turn, has been indicated as a cause of mental health problems amongst LGB groups (Mays & Cochran, 2001). Peer relations in childhood are also important to well-being. Sexual minority youth were shown to have smaller peer networks, and increased friendship loss, than their heterosexual peers (Diamond & Lucas, 2004). This is important as poor peer relations are a predictor of behavioural problems in children (Cohen-Kettenis, Bradley, & Zucker, 2003); with psychological well-being also partially relying on integration into peer groups (Corsano, Majorano, & Champretavy, 2006). As well as peers, family rejection has been linked to reduced health outcomes (Ryan, Russell, Huebner, Diaz, & Sanchez, 2010), and unsupportive social interactions have a significant negative impact on the well-being of LGB youth (Van Den Berghe, Dewaele, Cox, & Vincke, 2010).

All of these findings highlight areas that are negatively effecting the well-being of LGB people. They are summarised in the minority stress model, which outlines the role of stigma, prejudice, and discrimination, in creating a stressful social environment that in turn leads to mental health issues (Meyer, 2003). This model is supported by findings that unsupportive social interactions potentially have the greatest direct effect on the well-being

of LGB youth (Van Den Berghe, Dewaele, Cox, & Vincke, 2010), and an oppressive social environment created through stigma also negatively impacts well-being of those in the LGB community (Kelleher, 2009).

As well as identifying factors that lead to decreased well-being, factors have been found that can have a positive effect on well-being; the most prevalent of these factors being support, from both family, as well as general society. Increased support of a person's sexual orientation has been found to lead to decreased distress, (Doty, Willoughby, Lindahl, & Malik, 2010). More specifically, family acceptance of LGB people has also been linked to increased self-esteem and general health, as well as protecting against depression and suicidal ideation (Ryan, Huebner, Diaz, & Sanchez, 2009). This shows the importance for LGB youth and adults to have a supportive family and social network, as well as positive social interactions in general.

The above discussed factors that either positively or negatively affect the well-being of LGB populations, indicates that increased understanding and acceptance generally, could lead to a decrease in discrimination and stigmatisation, and in turn, have a positive impact on the well-being of sexual minorities.

LGB people are not the only ones to experience this decreased well-being. Transgender people are also been shown to have decreased quality of life and well-being, with high incidences of depression and anxiety amongst this group (Bockting, Miner, Swinburne Romine, Hamilton, & Coleman, 2013). Thirty-two percent of male-to-female and female-to-male transgender people were found to have attempted suicide, with gender-based discrimination being a factor associated suicide attempts (Clements-Nolle, Marx, & Katz, 2006). Female-to-male transgender people were shown to have lower quality of life in comparison to the US female and male population (Newfield, Hart, Dibble, & Kohler, 2006). Certain anecdotal findings have also suggested that transgender youth are even more vulnerable than cisgender LGB youth (Steiglit, 2010), potentially indicating lower well-

being and poorer mental health within the transgender youth population in comparison to cisgender LGB youth.

Despite it being clear from previous research that transgender people do experience mental health problems, perhaps even more so than non-transgender LGB populations, there is limited comparative research in this field. Some causes of lower well-being are the same in transgender and LGB groups, such as social stigmatisation. Similarly, family support increases well-being in both groups. This suggests that for all of these minority groups, discrimination, and lack of support, are particularly relevant to their mental health. However, unique factors affecting the well-being of transgender people in particular, have been identified. Not being able to speak about their feelings related to being transgender, nor identify with others who feel the same, was found to negatively impact the self-esteem and confidence of transgender people (Riley, Clemson, Sitharthan, & Diamond, 2012). As aforementioned, a diagnosis of gender dysphoria can accompany being transgender; significant distress and impairment in important areas of functioning have been associated with this (American Psychiatric Association, 2013). Thus, indicating that in of itself, the symptoms of having gender dysphoria could negatively affect well-being. This is perhaps highlighted by reports that early diagnosis and treatment for transgender youth with gender dysphoria, leads to improved adjustment and well-being in adolescence (De Vries, et al., 2014).

These finding suggest that there are similarities between cisgender LGB and transgender groups in the negative effects on their well-being, which can be jointly addressed. However, certain factors are only relevant to the well-being of transgender people. In this respect, strong systematic comparisons between cisgender and transgender groups are still missing, particularly those that take into account sexual orientation. Hence, the degree to which factors that affect the well-being of transgender people are shared with LGB populations, is still largely unknown.

The aim of Study 1 in this thesis is to address this gap by comparing the well-being of heterosexual transgender people, sexual minority transgender people, heterosexual cisgender people, and sexual minority cisgender people of both birth sexes in order to investigate the comparative differences in the well-being of these populations. From this, it is predicted that being transgender will have a significant and negative effect on well-being, compared to being cisgender. Furthermore, it is predicted that there will also be an effect of sexual orientation on well-being, with sexual minority participants, (both cisgender and transgender), having lower well-being than their heterosexual counterparts.

Well-being and Sex Atypicality

As discussed above, disparities between the well-being of LGBT groups and non-LGBT groups exist, with the former showing decreased well-being. Despite several sources being linked to the cause of this difference, the present research will discuss and investigate one in particular: sex atypicality. Increased sex atypicality has been shown amongst LGBT populations (Rieger, et. al., 2008; Zucker & Bradley, 1995), but does this affect their well-being?

It would seem logical that sex atypicality would impact well-being, as atypical behaviour makes individuals open to discrimination, and pressure to behave in a way that is typical for one's birth sex begins early in life (Steiglitz, 2010). This pressure to conform is even stronger for biological males compared to females, with increased expectations from fathers that their sons will follow masculine norms (Kane, 2006). Children who behaved in sex atypical ways were predicted to be more pressured to change their behaviour to be more conforming to their sex, and were more likely to be sexual minority adults (Thomas & Blakemore, 2013). Further to this, being under high pressure to conform has been connected to having a negative impact on the well-being of children (Yunger, Carver, & Perry, 2004). This pressure perhaps comes from the level of stigma that is attached to being

sex atypical (Coleman, et al., 2012), and in turn, this is linked to lower well-being, as well as sex atypicality being linked to lower well-being (Baams, Beek, Hille, Zevenbergen, & Bos, 2013). But it is not just pressure from others that can lead to decreased well-being. Internal conflicts over gender role and presentation can also have an effect in some cases, with increased gender role conflicts leading to increased anxiety and depression amongst gay men (Simonsen, Blazina, & Watkins Jr, 2000). Previous research has also indicated that the effect of sex atypicality on well-being may mediate the effect of sexual orientation on well-being. In fact, sex atypicality may be a more important factor for mental well-being than being homosexual is (Rieger & Savin-Williams, 2012). This may show that just being part of sexual minority alone does not have a detrimental effect in itself, but rather the behavioural and social consequences that are often related to this are what matter more for well-being. Less research has investigated the link between sex atypicality and well-being amongst transgender people; but initial research has suggested that transgender youth frequently go against socially expected gender norms, which in turn makes them vulnerable to discrimination (Steiglitz, 2010). Increasing sex atypicality amongst transgender youth has also been linked to an increased likelihood of being verbally and physically abused by their parents (Grossman A. H., D'Augelli, Howell, & Hubbard, 2006). This effect is particularly relevant as parental rejection has been strongly linked to well-being (Ryan, Russell, Huebner, Diaz, & Sanchez, 2010). Furthermore, increased school harassment relates to decreased feelings of safety as sex atypicality of transgender youth increases (McGuire, Anderson, Toomey, & Russell, 2010).

The above findings suggest that sex atypicality is an important factor that relates to well-being. It would seem that two possible causes of this effect exist: one is a direct effect due to internal conflicts, the other is an indirect effect through victimisation. There are findings that support both possibilities. Some support a more indirect effect of sexual atypicality, indicating that the effect of sex atypicality on well-being is mediated by stigmatisation and victimisation (Ryan, Russell, Huebner, Diaz, & Sanchez, 2010). However, sex atypicality has

also been shown to link directly to well-being among gay men (Simonsen, Blazina, & Watkins Jr, 2000). Despite these opposing findings, there is still evidence that higher sex atypicality negatively impacts well-being, whether directly or indirectly. This division in findings shows a need for further research, particularly within transgender groups, as little is known to what extent sex atypicality affects the well-being of this group when compared to other factors and populations. Therefore, the final aspect of the present research is investigating the difference in the effect of sex atypicality on well-being, depending on whether someone is transgender or cisgender, and heterosexual or of sexual minority. If transgender people are shown to be highest in their sex atypicality, it would suggest that any negative effect of sex atypicality would be strongest for transgender participants over cisgender LGB participants. However, cisgender LGB participants might have stronger effects of sex atypicality on well-being as compared to heterosexual cisgender participants. It is therefore predicted that increased sex atypicality will be linked to decreased well-being, and that this will be strongest among transgender participants, and weakest for heterosexual cisgender participants.

Study 2 presented here aimed to investigate the difference in well-being depending on sexual orientation, and being transgender or cisgender, as well as the effect of sex atypicality on subjective well-being.

Study 1: Effects on Sex Atypicality

This study compared the sex atypicality of cisgender and transgender participants of differing sexual orientations. Sex atypicality was measured via observer ratings of participants photographs, in both childhood and adulthood, as well as through self-report. It was predicted that transgender participants would be more sex atypical than cisgender participants, and that sexual minority participants would be more sex atypical than heterosexual participants.

Method

Participants

Targets: Participants were recruited through social media sites such as Facebook and Tumblr, where adverts were placed looking for all groups of participants, as well as targeted adverts for LGBT participants. Other recruitment methods included the use of mailing lists specifically for participant recruiting University of Essex students.

Of the recruited participants 18 identified as heterosexual cisgender women, 23 as sexual minority cisgender women, 46 as sexual minority female-to-male (FTM) transgender, and 14 as heterosexual FTM transgender. Identities were based on self-report, with participants being defined as cisgender if they stated that their birth sex was the same as their gender identity, and transgender if they indicated that their birth sex was different to their gender identity. Sexual orientation was based on the gender identity of participants. Heterosexual participants are those who indicated an attraction to those of the opposite gender. Sexual minority participants are those who indicated a sexual orientation that was not heterosexual; this includes bisexual and homosexual. So for FTM transgender participants, having a heterosexual orientation means they have an attraction to women, and an attraction to men if they are homosexual. The present study only focused on people with a

birth sex of female, but future research plans include investigating the same measures in people with a birth sex of male.

Mean ages were 23.4 (SD = 5.7), 21.7 (SD = 4.9), 22.1 (SD = 5.2), and 24.3 (SD = 6.8), for heterosexual cisgender women, sexual minority cisgender women, sexual minority FTMs, and heterosexual FTMs respectively. Age did not significantly differ between groups of participants, $p = .44$, $R^2 = .03$.

All participants provided childhood and adulthood photographs of themselves, with a total of 705 photographs being sent in. Of these photographs, 640 were used across four different surveys. Sixty-five photographs were excluded from the surveys, either because the quality of the image was too low, or it was not clear who was in the photograph. i.e., it was too zoomed out or blurry. Photographs were also excluded if participants did not indicate who they were in photographs where multiple people were present, and who did not clarify this after further communication. The average number of photographs in childhood and adulthood were calculated for each group of participants. For childhood photographs, the average numbers provided by cisgender heterosexual women, cisgender sexual minority women, heterosexual FTM transgender people, and sexual minority FTM transgender people, were 5.38 (2.22), 3.43 (2.33), 3 (1.88), and 3.49 (2.82) respectively. For adulthood photographs, an average of 2.75 (1.65), 2.04 (1.15), 5.36 (3.61), and 2.2 (1.65) was provided by each participant group respectively.

The average ages of individuals in childhood photographs (ages ranged between 0-15) provided by heterosexual women, sexual minority women, and sexual minority FTM transgender participants, and heterosexual FTM transgender participants, were 7.2 (SD = 4.2), 8.4 (SD = 8.4), 8.1 (SD = 4.1), and 7.9 (SD = 4.3), respectively. Ages did not differ significantly between participant groups, $p = .31$, $R^2 = .01$.

Raters: Rater participants were recruited through the use of Sona Systems at the University of Essex, a system specifically designed for the recruitment of undergraduate students to

take part in research. Facebook was also used to recruit participants. Forty-one heterosexual females, 15 sexual minority females, 14 heterosexual males, 3 sexual minority males took part.

Average ages for each group of raters were 24.9 (SD = 10.6), 28.5 (SD = 12.4), 24 (SD = 6.5), and 22.2 (SD = 4), respectively. Ages of participants did not differ significantly depending on sexual orientation, $p = .22$, $R^2 = .01$, or birth sex, $p = .62$, $R^2 = .01$.

Self-Report Measures

Sex Atypicality: Childhood sex atypicality was measured using the Childhood Gender Nonconformity Scale (Rieger, Linsenmeier, Gygax, & Bailey, 2008). Statements included “as a child I was perceived as more feminine/masculine by my peers”. Adulthood sex atypicality was measured using the Continuous Gender Identity Scale (Rieger, Linsenmeier, Gygax, & Bailey, 2008). Statements included “my mannerisms are not very masculine/feminine”. With masculine appearing in scales shown to participants with an assigned sex of female, and feminine in scales shown to participants with an assigned sex of male. All participants completed these measures and answered them according to their assigned birth sex, rather than their gender. For example, a female-to-male transgender participant would have completed the ‘female sex’ version of the scale. Participants rated their agreement with each item on a 7-point likert scale, ranging from “*strongly disagree*” to “*strongly agree*”. Item reliability (Cronbach’s alpha) for the childhood scale in participants who were either cisgender, or transgender, was .92 and .87, respectively. In the adulthood scale, reliability for cisgender and transgender participants was .91 and .83, respectively. Scores on different items were averaged to create one childhood and one adulthood sex atypicality score for each participant. Higher scores indicated higher sex atypicality (in relation to their birth sex); for transgender participants this would indicate increased typicality to their transitioned gender (one different to their birth sex).

Procedure

Targets: Targets completed a survey using Qualtrics about their demographics and sex atypicality. They were also instructed to provide a selection of childhood photos from different age ranges, from when they were 0-15 years of age, as well as some recent photographs of them as adults. Participants were instructed to provide any given photographs easily available to them from any age ranging from 0-15 years, regardless of content. This was done so rating scores for multiple different childhood ages would be available for each participant.

Raters: Raters were given no information about the sexual orientation or gender identity about individuals in the photographs, but were informed of their assigned birth sex. They were also informed that they may see the same person more than once, but should give ratings based on each individual photograph.

Within birth sex sex, photographs were displayed in a random order for each rater, and were split by childhood and adulthood time periods. Raters saw one photograph at a time, and rated the person in it from “very masculine” to “very feminine”. Once they had given their rating, raters had to select a button to proceed to the next photographs, this did not happen automatically.

Results

Interrater Consistency

Interrater reliability (Cronbach's alpha) for participants who rated photographs on masculinity/femininity (sex atypicality) exceeded .94 for all four groups of raters (heterosexual and sexual minority men and women). Across all raters, both childhood and adulthood, interrater reliability exceeded .96. Therefore, ratings were averaged for each target photo across all raters.

Correlation of Sex Atypicality Between Measures and Ages

Correlation analyses were conducted between sex atypicality scores to test their relationships. These analyses were done to investigate the consistency between self-report and observer rated measures of sex atypicality, as well as the consistency in sex atypicality from childhood to adulthood. The correlation between self-reported combined sex atypicality scores (both childhood and adulthood), and combined rated sex atypicality for cisgender participants, was $p < .001$, $\beta = .69$, and for transgender participants was, $p = .007$, $\beta = .36$. These correlations are broken down further by sexual orientation in Tables 1 and 2.

Table 1 Correlations among measures of sex atypicality for heterosexual cisgender participants (n 18) and sexual minority cisgender participants (n 23)

Measure	Childhood Rated	Adulthood Rated	Childhood Self-Report	Adulthood Self-Report
Childhood Rated	X	.51 [†]	.47 [†]	.24
Adulthood Rated	.40 [†]	X	.34	.42
Childhood Self-Report	.46*	.53*	X	.79**
Adulthood Self-Report	.35	.77***	.70**	X

Note. Cisgender heterosexual participants of all sexual orientations are shown above the diagonal and cisgender sexual minority participants of all sexual orientations are shown below the diagonal.

* $p < .05$ ** $p < .001$ *** $p < .0001$, [†] $p > .05$ but $< .1$

Table 2 Correlations among measures of sex atypicality for heterosexual transgender participants (n 14) and sexual minority transgender participants (n 46)

Measure	Childhood Rated	Adulthood Rated	Childhood Self-Report	Adulthood Self-Report
Childhood Rated	X	.31	.34	.41
Adulthood Rated	.31 [†]	X	-.30	-.29
Childhood Self-Report	.33*	.24	X	.47
Adulthood Self-Report	.02	.30 [†]	.43**	X

Note. Transgender heterosexual participants of all sexual orientations are shown above the diagonal and transgender sexual minority participants of all sexual orientations are shown below the diagonal.

*p<.05 **p<.001 † p >.05 but <.1

Overall, these analyses showed mostly significant correlations between self-reported sex atypicality and observer rated sex atypicality, particularly in childhood and among cisgender participants. They also generally showed significant correlations between childhood and adulthood sex atypicality, indicating that sex atypicality is a relatively stable trait, and childhood atypicality can predict adulthood atypicality. Correlations were generally stronger among cisgender participants, as compared to transgender participants (Table 3), and among sexual minority participants, as compared to heterosexual participants (comparing results across

Tables 1 and 2).

Table 3 Correlations among measures of sex atypicality for cisgender participants (n 41) and transgender participants (n 60)

Measure	Childhood Rated	Adulthood Rated	Childhood Self-Report	Adulthood Self-Report
Childhood Rated	X	.30 [†]	.47**	.33*
Adulthood Rated	.40**	X	.54**	.73***
Childhood Self-Report	.39**	.26 [†]	X	.77***
Adulthood Self-Report	.16	.25 [†]	.47**	X

Note. Cisgender participants of all sexual orientations are shown above the diagonal and transgender participants of all sexual orientations are shown below the diagonal.

*p<.05 **p<.001 ***p<.0001 † p >.05 but <.1

Table 4 Correlations among measures of sex atypicality for all four groups of participants combined (n 101)

Measure	Childhood Rated	Adulthood Rated	Childhood Self-Report	Adulthood Self-Report
Childhood Rated	X	.53***	.53***	.43***
Adulthood Rated	.53***	X	.62***	.72***
Childhood Self-Report	.53***	.62***	X	.76***
Adulthood Self-Report	.43***	.72***	.76***	X

Note. Participants of all sexual orientations and gender identities are shown combined both above and below the diagonal

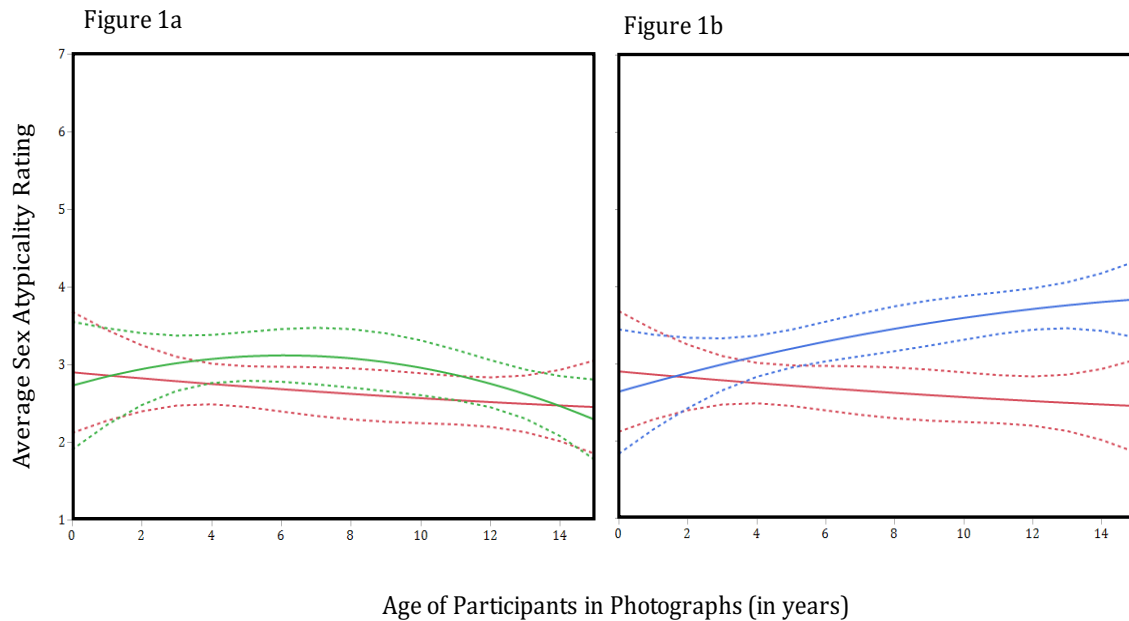
***p<.0001

When all cisgender and transgender participants of all sexual orientations are combined, all correlations become highly significant (Table 4).

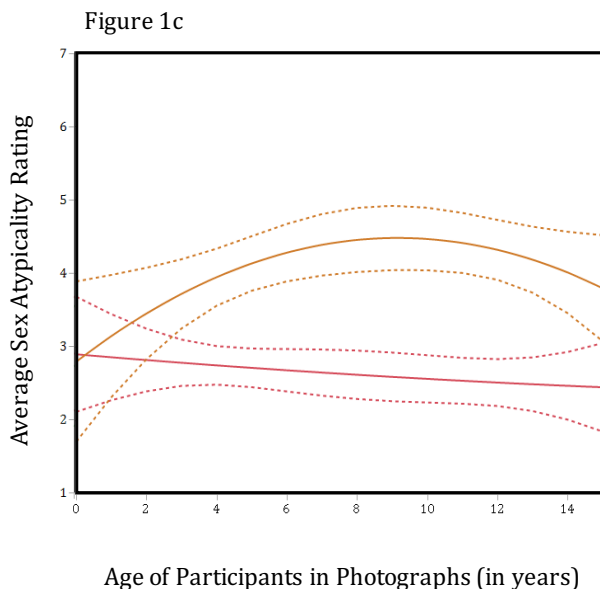
Are there Differences in the Development of Childhood Sex Atypicality Depending on Sexual Orientation, and Being Transgender or Cisgender?

To investigate the differences in the development of childhood sex atypicality between the four groups, a mixed-effects regression analysis was carried out. The predicted variable was rated sex atypicality (averaged for each photo across raters), and predictors were gender identity (being transgender or cisgender), sexual orientation, age, and their interactions. Participants were included as a random effect to account for repeated ratings of participants with multiple photos. Because previous analysis indicated that the correspondence of sex atypicality with age does not need to be linear (Rieger et al, 2008), a further predictor of sex atypicality, by the curvilinear effect of age (and all its interactions with other variables), was included. These curvilinear effects (and its interactions) were not significant in the majority of present analysis, and did not add to further interpretation of results, so are therefore not further discussed.

Results of the mixed-effects regression analysis indicated that, in general, female-to-male transgender participants were rated as more sex atypical than cisgender women, $p < .001$, $\beta = .39$. A significant interaction suggested that this effect differed by age – regardless of sexual orientation, as participants became older, female-to-male transgender people became more sex atypical, whereas cisgender women did not increase in sex atypicality, $p = .0001$, $\beta = .17$. In addition, a further interaction suggested that, in general, heterosexual (those attracted to females) female-to-male transgender participants were the most sex atypical, whereas cisgender women, regardless of sexual orientation, were the least sex atypical, $p = 0.178$, $\beta = .28$ (Figure 1a-1c).



For comprehension of the found interactions, Figure 1a-c show the effect of age, ranging from 0-15 on sex atypicality for all groups. In each panel, cisgender heterosexual participants (lowest line) are the reference group to all cisgender sexual minority participants (Figure 1a), to transgender sexual minority participants (Figure 1b), and to transgender heterosexual participants (Figure 1c).



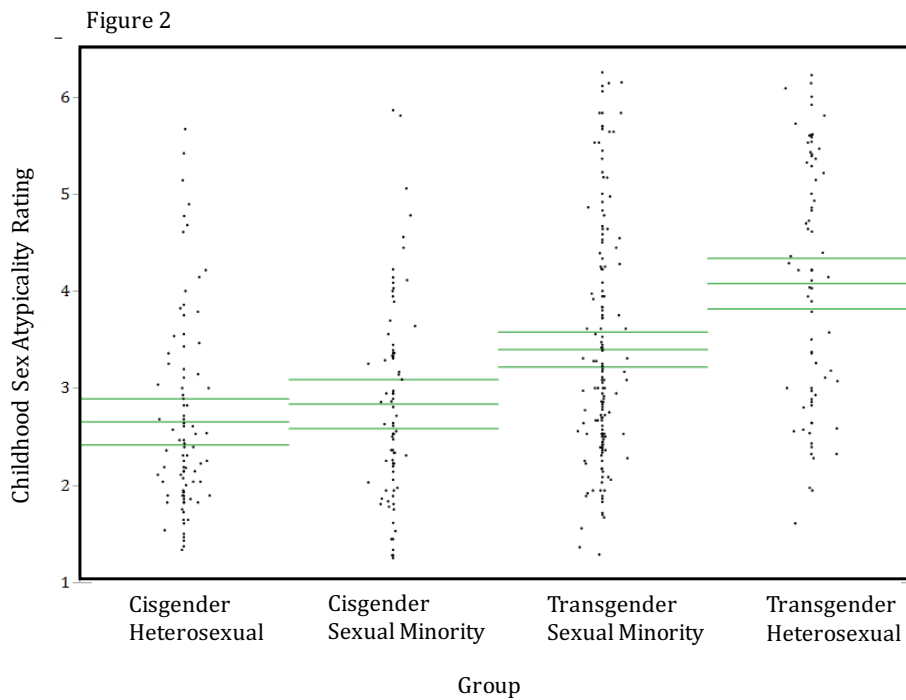
These results indicate that cisgender participants did not increase in their sex atypicality as they get older, whereas transgender participants did. In addition, Figures 1b and 1c show that these differences between heterosexual cisgender participants, and either transgender groups, occurred early in childhood (between

2-6 years). Between heterosexual cisgender participants, and heterosexual transgender participants in particular, this difference emerged by 2-3 years of age (Figure 1c). These differences were determined by examining where the 95% confidence intervals of the

regression coefficient started to separate. Surprisingly, Figure 1a does not suggest any significant difference in sex atypicality across age between cisgender heterosexual participants and sexual minority participants. Still, these results supported the hypothesis that female-to-male transgender participants have higher sex atypicality than cisgender women in childhood.

Are People Who Are Transgender More Sex Atypical Than Those Who Are Cisgender?

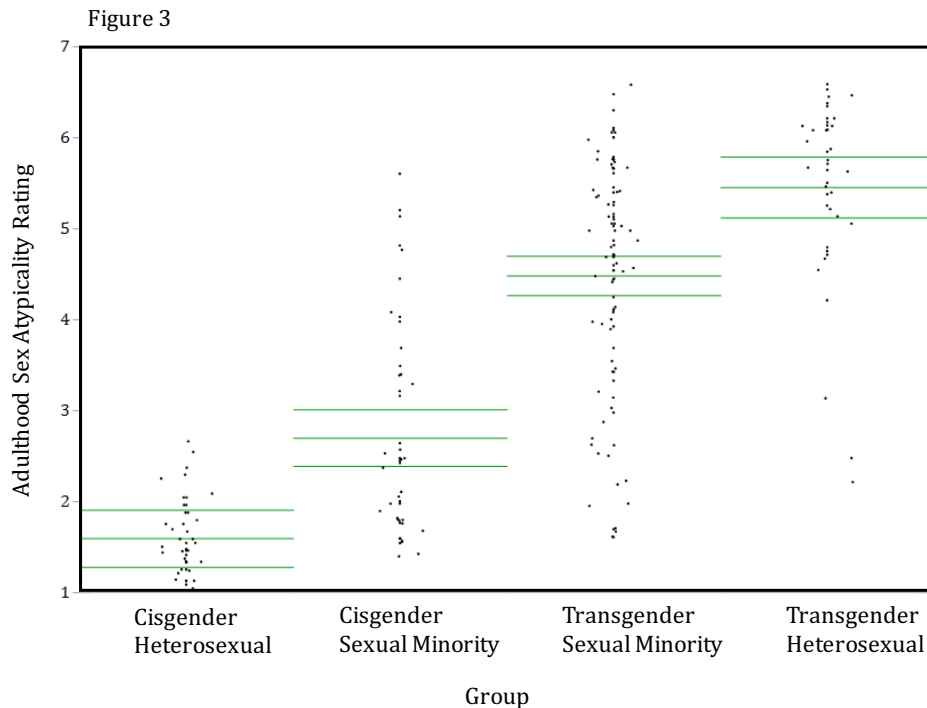
Observer Rated Sex Atypicality



A one-way ANOVA was conducted to investigate the average rated sex atypicality depending on sexual orientation, and whether a participant was transgender or cisgender. Comparisons were conducted for two broad age periods - childhood (ratings until age 15), and adulthood (all photos of recent ages). For these analyses, average ratings were further averaged within participants across photographs from the childhood period. A significant

difference in rated childhood sex atypicality was found between the groups, $p < .001$, $R^2 = .25$. Figure 2 shows that for childhood sex atypicality, cisgender heterosexual women scored the lowest, female-to-male transgender participants scored the highest, and transgender and cisgender sexual minority groups were in-between.

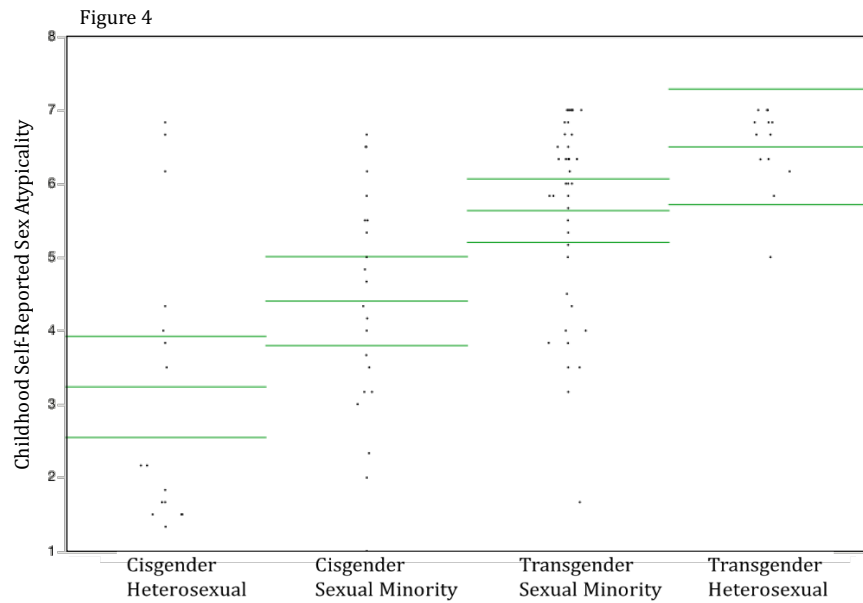
A corresponding analysis was conducted to test the difference in adulthood sex atypicality, depending on sexual orientation and whether participants were transgender or cisgender. A significant difference in rated adulthood sex atypicality was found between the groups, $p < .001$, $R^2 = .59$ (Figure 3). These results show that either sexual orientation, or being transgender or cisgender, or a combination of the two, leads to differences in rated sex atypicality. Similar to Figure 2, Figure 3 shows that cisgender heterosexual women scored the lowest, female-to-male transgender participants scored the highest, and transgender and cisgender sexual minority groups were in-between. However, in general, differences in adulthood sex atypicality were stronger between groups than the corresponding differences in childhood sex atypicality - this was especially due to the fact that transgender groups were markedly more sex atypical in adulthood than childhood (compare Figure 2 and Figure 3).



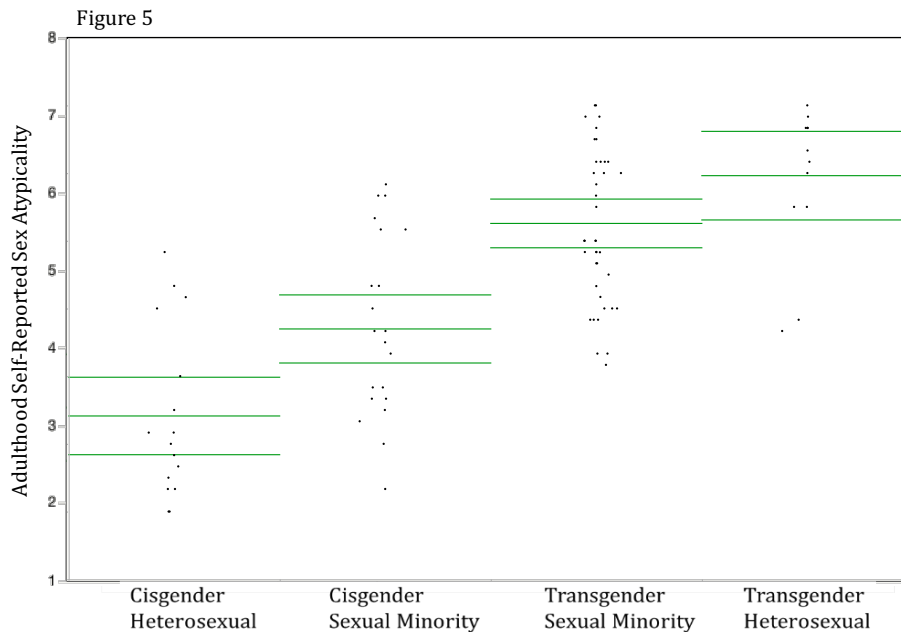
A multiple linear regression analysis was conducted to expand on whether the effect on rated childhood sex atypicality depended on gender identity (being transgender or cisgender), sexual orientation, or a combination of the two. Results indicated a significant main effect of being transgender or cisgender (gender identity), $p < .001$, $\beta = -.37$, a significant main effect of sexual orientation, $p = .01$, $\beta = -.12$, and a significant interaction between sexual orientation and gender identity, $p < .001$, $\beta = .17$. This interaction suggested that being transgender and heterosexual related to the highest ratings of sex atypicality (compare with Figure 2).

A corresponding regression analysis was conducted for rated adulthood sex atypicality. A significant main effect of gender identity was found, $p < .001$, $\beta = -.66$, but no significant main effect of sexual orientation, $p = .47$, $\beta = -.03$. Yet, a significant interaction between sexual orientation and gender identity was detected, $p < .001$, $\beta = .27$. Similar to the findings for childhood sex atypicality, being both transgender and heterosexual, resulted in the highest adulthood sex atypicality ratings (compare with Figure 2).

Self-Reported Sex Atypicality



A one-way ANOVA was conducted to investigate the average self-reported sex atypicality in childhood, depending on sexual orientation, and whether a participant was transgender or cisgender. For these analyses, average scores were created for each participant from their self-report responses. A significant difference in self-reported sex atypicality was found between the groups, $p < .001$, $R^2 = .37$. Heterosexual cisgender women were the lowest in sex atypicality, and heterosexual female-to-male transgender participants were the highest. Sexual minority cisgender and transgender participants fell in between (Figure 4).



A multiple linear regression analysis was carried out to expand on whether self-reported sex atypicality depended on being transgender or cisgender, sexual orientation, or a combination of the two. Results indicated a significant main effect of gender identity $p < .001$, $\beta = -.45$, no significant main effect of sexual orientation, $p = .36$, $\beta = .09$, and no significant interaction between sexual orientation and gender identity, $p = .11$, $\beta = .16$. This suggests that being transgender, regardless of sexual orientation, has the largest effect on sex atypicality.

This analysis was repeated for self-reported adulthood sex atypicality, with a one-way ANOVA showing a significant difference in self-reported childhood sex atypicality between the groups, $p < .001$, $R^2 = .52$. Cisgender heterosexual participants scored the lowest, and heterosexual transgender participants scored the highest. Cisgender and transgender sexual minority groups were in-between (Figure 5).

A corresponding regression analysis was conducted for self-reported sex atypicality in participants with a birth sex of male. A significant main effect of being transgender or cisgender was found, $p < .001$, $\beta = -.59$, but no significant main effect of sexual orientation, $p = .72$, $\beta = -.03$. Finally, no significant interaction between sexual orientation and gender

identity was found, $p = .06$, $\beta = -.17$. Similar to the findings for childhood sex atypicality, being transgender had the greatest effect on sex atypicality.

The results from self-reported and observer rated sex atypicality showed similarities, both showing that being transgender has the largest effect on sex atypicality scores in both childhood and adulthood. Unlike observer rated results, self-reported results did not show any significant effects of sexual orientation in adulthood, whereas neither measure showed an effect of sexual orientation in childhood. Further to this, no significant interactions were found between sexual orientation, and being transgender or cisgender, in self-reported sex atypicality, but such interactions were found in both childhood and adulthood in observer rated sex atypicality overall. This suggests that transgender participants were both rated as, and reported being, more sex atypical than cisgender participants, and there were no consistent effects of sexual orientations for either transgender or cisgender participants.

Discussion

The first question that the present research investigated, was differences in sex atypicality in childhood and adulthood. This was done by comparing cisgender and transgender adults, who were either heterosexual or of sexual minority, on their sex atypicality. As a reminder, sexual orientation was based on gender opposed to assigned birth sex, meaning that heterosexual FTM participants are those attracted to females, and those attracted to males are homosexual. This pattern is opposite for MTF transgender people. Observer ratings of childhood and adulthood photographs, and participant and self-report were both used to measure each participant's sex atypicality. Presently, only people with a birth sex of female, both cisgender and transgender, took part. It was predicted that female-to-male transgender participants would be rated as more sex atypical based on both childhood and adulthood photographs, as well as reporting themselves as being more sex atypical in both childhood and adulthood, than cisgender women, including those of sexual minority.

The results supported this hypothesis, in addition to which the data showed different developmental patterns in sex atypicality between the four groups throughout childhood, from ages of 0 to 15 years. Heterosexual transgender participants were rated as the most sex atypical (most masculine), and cisgender heterosexual participants as the least (most feminine). Further to this, self-reported sex atypicality was found to be the highest among participants who were transgender and heterosexual, in both childhood and adulthood, and lowest for both age groups in cisgender heterosexual participants. The effect of sexual orientation is more complex, and appears to be dependent on whether participants were cisgender or transgender. Heterosexual transgender participants were rated as more sex atypical in both childhood and adulthood than sexual minority transgender participants. The opposite pattern was found in cisgender women (although not always significantly so), with those who were heterosexual being lower in sex atypicality than those who were of sexual minority, and this difference increased from childhood to adulthood.

The finding that female-to-male transgender participants differed in their sex atypicality depending on their sexual orientation, supports previous findings that the relationship between childhood sex atypicality and adulthood sexual orientation among female-to-male transgender men matches the pattern found in cisgender men (Chivers & Bailey, 2000). This is important as it indicates that transgender people, who have a gender identity of male, show similar behavioural patterns as cisgender men in terms of their development in this area. With those attracted to women in both populations being more masculine, and those attracted to men being less masculine.

The present research also investigated sex atypicality changes throughout childhood between 0-15 years of age. This showed that as transgender participants got older within childhood, they were rated as increasingly sex atypical, whereas cisgender participants (both heterosexual, and sexual minority) did not increase in atypicality with age. Heterosexual transgender participants were rated as the most atypical throughout childhood, whereas both groups of cisgender participants were rated as the least. Some differences were found between heterosexual and sexual minority transgender participants, with those who were heterosexual increasing faster in sex atypicality, and from an earlier age (Figure 1). All groups of participants, both transgender and cisgender, were rated similarly on sex atypicality based on baby photos from under 2 years of age. Differences between heterosexual cisgender, and the heterosexual transgender group, emerged at around 2 years of age, and this difference increased with age. For sexual minority transgender participants, this difference emerged slightly later at around 5-6 years of age, but again increased with age. For cisgender participants, there were no significant differences in sex atypicality throughout childhood depending on sexual orientation, with both heterosexual, and sexual minority groups following similar trajectories, and they in fact decreased somewhat in sex atypicality between the youngest and oldest ages. This finding will be further discussed below.

These findings show that female-to-male transgender people start behaving in significantly more masculine ways to cisgender women from a very early age. This difference was most pronounced in heterosexual transgender participants. The age at which these differences emerge, and the fact that they do not occur in sexual minority cisgender women, is of particular interest when related to typical gender development and knowledge of children. Children as young as preschool age show understanding of their gender membership (Ruble, Martin, & Berenbaum, 2007), which causes motivation from them to fit in with those of the same gender group, and this also increases with age (Martin & Ruble, 2004). Contrastingly, transgender participants go against this, which could be argued to occur because perhaps, even from a very young age, they self-identify or at least have a feeling, that their gender group membership is with a gender different to their birth sex. This would explain why they show early sex atypicality that only increases with age. The age at which transgender participants started being rated as more sex atypical than cisgender participants also occurred at a similar age that most children become aware of gender differences, which is from around 2 years of age (Hill & Flom, 2007). The behaviour of transgender people appears to go against how they were socialised, as even very early in development, girls and boys experience differing environments (Pomerleau, Bolduc, Malcuit, & Cossette, 1990), and parents react more favourably to sex typical behaviours compared to sex atypical behaviours from their children (Fagot, 1978). This supports the theory that being transgender, and people's gender, are not socialised and could therefore have a biological basis.

There is evidence for genetic influences on gender development, particularly among masculine girls, where high masculinity and low femininity variance was mostly accounted for by heritability (Knafo, Iervolinio, & Plomin, 2005). Pre-natal hormone exposure also seems to influence sex-typed variation in behaviour, as well as influencing sex typical or atypical behaviours (Hines, 2010). These factors, along with what was found in the present study, indicates that being transgender could at least be partially determined in pre-natal or

very early postnatal stages of development. It shows that, on average, even very early in life at an age where pre-transgender children are living as the same gender as their birth sex, there is a significant difference between those who will grow up to be transgender, and those who will grow up to be sexual minority, but cisgender. This supports previous findings that more severe cross-sex behaviour in childhood is linked to increased chance of a later diagnosis of gender dysphoria (Drummond, Bradley, Peterson-Badali, & Zucker, 2008), however this was only previously linked to sexual orientation, and not being transgender.

Despite the findings among transgender participants, the present study did not support some of the previous findings on sex atypicality differences, specifically the link between childhood sex atypicality and adulthood sexual orientation among cisgender people. It has previously been well established that sexual minority cisgender people are more sex atypical than their heterosexual counterparts, in childhood and adulthood (Rieger et. al., 2008). But the present findings only showed that being transgender, compared to cisgender, had a significant and consistent effect on sex atypicality ratings. This raises the question as to why sexual minority cisgender women were not found to be more sex atypical than those who were heterosexual.

The present research was the first to use observer rated sex atypicality when looking at the childhood and adulthood levels in transgender people, but this method has previously been used to investigate the difference between cisgender people of differing sexual orientations (Rieger, Linsenmeier, Gygax, & Bailey, 2008). The use of photographs, rather than self-report, reduces the potential for poor retrospective accounts as well as biased reports. Participants may not remember correctly their behaviour from childhood, or may want to appear more or less sex atypical than they actually were. This is particularly relevant among the female-to-male transgender participants, as it is likely that being more masculine would be more favourable within this group, as they identify as male despite having a birth sex of female.

Despite the reduction of previous methodological issues, the use of photographs creates a new one. The photographs sent in by participants are difficult to strictly control for; despite asking for a range of photographs across several different ages from each participant, it is still possible that some participants selected photographs that showed them in a way that they preferred. For example, female-to-male transgender participants may have sent in photographs that showed them in a particularly more masculine way. This could be partly resolved by asking participants' parents about their behaviour as well. This would give a second perspective and a different type of report.

Future directions of this area of research would include conducting longitudinal studies, following both sex atypical and sex typical children from early childhood into adulthood, similar to that of Steensma et. al., (2011), and investigating how their behaviour relates to their adulthood sexual orientation and gender identity. This would reduce the previously discussed issues with using retrospective self-report and providing photographs. As well as this, the present study only compared female-to-male transgender people, to cisgender women; the same comparisons should be done between male-to female transgender people, and cisgender men. Additionally, comparisons between female-to-male transgender people to cisgender men, and male-to-female transgender people to cisgender women should be included. This would help to determine if transgender people are just dissimilar to their birth sex, or if they are also similar to the transitioned gender, or fall somewhere in between the two, in terms of their behaviour and appearance.

Study 2: Effects on Well-being

This study investigated differences in the well-being of transgender and cisgender populations of differing sexual orientations, as well as the effect of sex atypicality on well-being among these groups. It was predicted that (1) transgender participants would have lower well-being than all cisgender participants, but sexual minority cisgender participants will have lower well-being than their heterosexual counterparts, and (2) increased sex atypicality would be linked to decreased well-being, particularly among sexual minority groups.

Method

Participants

Participants were recruited through social media sites such as Facebook and Tumblr where adverts were placed looking for all groups of participants, as well as targeted adverts for LGBT participants.

A total of 2114 participants completed the survey, of which 439 were excluded due to not meeting the minimum age requirement of 18 years old, and a further 3 were excluded as they did not complete a sufficient amount of the measures in the survey in order to provide enough data to be analysed. .

Of included responses, recruited participants with a birth sex of male consisted of 57 heterosexual males, 200 sexual minority males, 22 heterosexual male-to-female (MTF) transgender people, and 119 sexual minority (MTF) transgender people, with a total of 398. The average ages of participants in these groups were 25.5 (SD = 9.2), 23.8 (SD = 7.9), 26.3 (SD = 9.9), and 25.8 (SD = 10.6), respectively. Ages did not differ significantly between participants in these groups, $p = 0.19$, $R^2 = .01$.

Participants with a birth sex of female included 126 heterosexual women, 440 sexual minority women, 104 heterosexual female-to-male (FTM) transgender participants, and 604 sexual minority FTM transgender participants, with a total of 1276. The average age of participants in each of these groups were 22.3 (SD = 7.5), 20.7 (SD = 4.2), 21.7 (SD = 4.7), and 20.7 (SD = 4.2), respectively. Ages differed significantly between these groups, with cisgender heterosexual participants being older on average than other groups $p = .001$, $R^2 = .01$. Overall, participants with a birth sex of male were significantly older than participants with a birth sex of female, $p < .001$, $R^2 = .07$. However, these age differences did not significantly affect the below results. Hence, for the simplicity of interpretation, these group differences in age are not further addressed.

Self-Report Measures

Sex Atypicality: Measures used here are the same as in Study 1, with all participants completing both the childhood gender nonconformity (Rieger, Linsenmeier, Gygax, & Bailey, 2008) and the continuous gender identity scale (Rieger, Linsenmeier, Gygax, & Bailey, 2008). Again, participants answered scales based on their birth sex, rather than their gender identity. Item reliability (Cronbach's alpha) for the childhood scale for participants with a birth sex of female was .84, and .88, for cisgender and transgender participants respectively. For participants with a birth sex of male, item reliability for this scale was .78, and .85, for cisgender and transgender participants respectively. In the adulthood scale, reliability was .88, and .91 respectively, for cisgender and transgender participants with a female birth sex. For participants with a birth sex of male, reliability scores for this measure were .84, and .89, for cisgender and transgender participants respectively. Scores on different items were averaged to create one childhood and one adulthood sex atypicality score for each participant. Higher scores indicate higher sex atypicality (in relation to birth sex); for

transgender participants this indicated increased typicality to their transitioned gender (which is different to their birth sex).

Subjective Well-being: Subjective well-being was measured using the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), which consisted of 5 statements. Example statements include “The conditions in my life are excellent” and “I am satisfied with my life.” Participants rated their agreement with each item on a 7-point likert scale, ranging from “*strongly disagree*” to “*strongly agree*”. Item reliability (Cronbach’s alpha) for the items was above .9 for all participant groups.

Procedure

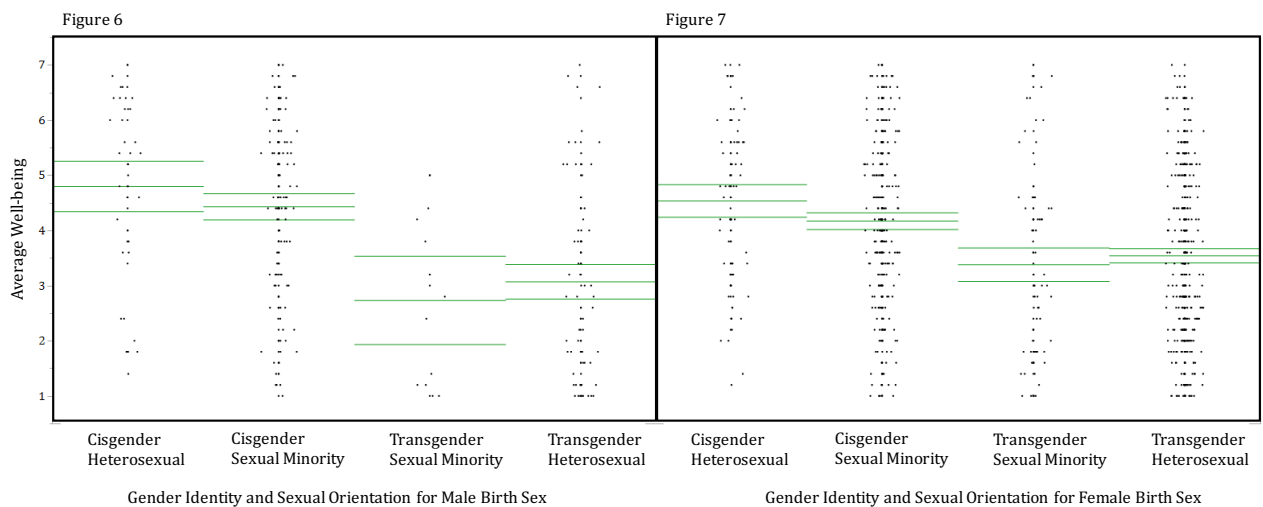
Participants completed a survey online using Qualtrics that lasted no longer than 25 minutes. They first read an introduction page and consented to take part. Participants then completed demographics, including age and gender, before filling in the scales outlined above.

Results

Is Subjective Well-being Lower in Transgender Groups, Compared to Cisgender Groups?

A one-way ANOVA was conducted to investigate differences in the average subjective well-being of participants, depending on their sexual orientation, and whether they were transgender or cisgender. A significant difference in subjective well-being, depending on group, was found in both participants with a male birth sex, and female birth sex, $p < .001$, $R^2 = .16$ (Figure 6), $p < .001$, $R^2 = .1$ (Figure 7), respectively.

In Figures 6 and 7, transgender participants have significantly lower well-being than cisgender participants did. A multiple linear regression analysis was conducted to investigate if there was any effect of sexual orientation, or an effect of an interaction of gender status (cisgender or transgender) and sexual orientation, on well-being. For participants with a birth sex of male, a significant main effect of being transgender was found $p < .001$, $\beta = .39$. No significant effect of sexual orientation was found, $p = .57$, $\beta = .03$, and no significant interaction was found between sexual orientation, and being transgender or cisgender, $p = .58$, $\beta = -.03$. This suggests that regardless of sexual orientation, transgender participants were lower in well-being than cisgender participants.



For participants with a birth sex of female, a significant main effect of being transgender was found $p < .001$, $\beta = .24$. No significant effect of sexual orientation was found, $p = .88$, $\beta = .004$, but a weak significant interaction was found between sexual orientation, and being transgender or cisgender, $p = .03$, $\beta = -.06$. Figure 7 illustrates this interaction; transgender participants were the lowest in well-being on average, independent of sexual orientation, however, within cisgender participants, sexual minorities were somewhat lower than their heterosexual counterparts. Regardless of this interaction, Figures 6 and 7 suggest that overall, being transgender (for both birth sexes) has a larger negative impact on well-being than being of sexual minority does.

These results supported the hypothesis that transgender participants would be lower in subjective well-being than cisgender participants. But it did not fully support the hypothesis that sexual minority participants, both cisgender and transgender, would be lower in well-being than their heterosexual counterparts.

Is Subjective Well-Being Affected by Sex Atypicality?

A bivariate correlational analysis was carried out to investigate the correlation between average self-reported sex atypicality scores, and subjective well-being, in participants with a birth sex of male. These results showed no significant correlation between sex atypicality and well-being for cisgender heterosexual men, $p = .08$, $\beta = -.25$. However, a significant negative correlation was found amongst cisgender sexual minority men, $p < .001$, $\beta = -.26$. No significant correlations were found for transgender participants who were either heterosexual, $p = .21$, $\beta = .33$, or of sexual minority, $p = .38$, $\beta = .09$.

This analysis was repeated for participants with a birth sex of female. A significant correlation was found between well-being and sex atypicality amongst cisgender participants, both those who are heterosexual, and sexual minority, $p = .04$, $\beta = -.20$, and $p = .02$, $\beta = -.12$, respectively. No such significance was found amongst transgender

heterosexual, or sexual minority participants, $p = .89$, $\beta = .01$, and $p = .87$, $\beta = .007$, respectively.

These findings only go some way to supporting the hypothesis that increased sex atypicality would lead to decreased well-being, even when breaking down analyses for sexual orientation and being transgender. This effect was only found amongst cisgender participants, being slightly stronger in cisgender men than cisgender women.

It was then investigated whether being transgender or cisgender remain a predictor of decreased well-being, after sex atypicality and sexual orientation had been statistically controlled for. A multiple linear regression was performed to further investigate the link between sex atypicality, sexual orientation, and being transgender, on well-being. Participants were split by birth sex for analysis.

The effect of gender identity remained significant, $p < .001$, $\beta = .32$. However, the effect of sexual orientation was not significant, $p = .33$, $\beta = .05$, the effect of sex atypicality was weak but significant, $p = .05$, $\beta = -.13$. These results suggested that being transgender remained a significant predictor of decreased subjective well-being amongst those with an assigned birth sex of male. However, sex atypicality also had an independent negative effect on well-being.

The above analysis was repeated for participants with a birth sex of female. The effect of gender identity on well-being remained significant, $p < .001$, $\beta = .2$. However, the effect of sexual orientation was not significant, $p = .95$, $\beta = -.002$. In addition, sex atypicality in itself had no negative effect on well-being, $p = .06$, $\beta = -.07$. These results suggest that for participants whose assigned birth sex is female, being transgender is the most prominent variable to have a significant negative affect on subjective well-being.

Discussion

Well-being

This research directly compared the subjective well-being of participants, depending on sexual orientation and whether they were transgender or cisgender. This was investigated using a self-report measure of subjective life satisfaction. It was predicted that transgender participants would be significantly lower in their subjective well-being than cisgender participants, and that sexual minority participants will be significantly lower in well-being than their heterosexual counterparts, both transgender, and cisgender.

The predictions were partially supported by the results, with transgender participants scoring the lowest in well-being. Sexual minority participants, both cisgender and transgender, did not score significantly lower than their heterosexual counterparts. This pattern was found for participants of both birth sexes. This indicates the presence of factors relating to being transgender that lead to people having significantly decreased well-being, that do not have the same effect on the well-being of cisgender people (including those of sexual minority). This highlights the importance of investigating these potential factors in order to increase the well-being of transgender people.

The findings here support previous research that showed diminished quality of life among female-to-male transgender people (Newfield, Hart, Dibble, & Kohler, 2006), as well as increased occurrence of clinical depression in transgender people (Bockting, et. al., 2013). However, it does not support previous findings of decreased well-being among cisgender sexual minority people (Meyer, 2003; King, et al., 2008). The reasons for this lack of support for previous findings are not known, but it shows that being transgender leads to lower well-being overall. It could be that this difference is caused by factors unique to being transgender; one such factor is gender dysphoria, which has been linked to high psychiatric comorbidity (Hepp, Kraemer, Schnyder, & Delsignore, 2004), as gender dysphoria is often

associated with significant distress (American Psychiatric Association, 2013). Hormonal and surgical intervention has been found to be an effective treatment for gender dysphoria (Gijs & Brewaeys, 2007), leading to a decrease in symptoms, depression and anxiety, and an increase in well-being (Gomez-Gil, et al., 2012). To determine this effect, future research should account for hormonal or surgical treatment when comparing well-being, to see if transgender people who have received treatment are still lower in well-being than cisgender people, as well as investigating the effect of treatment independently among transgender people.

The potential reasons for decreased well-being in transgender people needs to be studied. It could be that transgender participants experience increased stigmatisation and discrimination, are less accepted by their parents, are negatively affected by gender dysphoria, or a combination of these factors. One factor that is potentially relevant to the well-being of this group was investigated in the present research; this was sex atypicality, which is discussed below.

Well-being and Sex Atypicality

The final aspect of the present research was investigating whether sex atypicality levels had an effect on well-being. This included whether this could at least partially explain the disparity found in well-being between transgender, and cisgender participants. It was predicted that being higher in sex atypicality would lead to decreased well-being, and that this would be particularly relevant among minority participants.

The hypothesis was partially supported, with some groups experiencing lower well-being in relation to increased sex atypicality, but not all. Being transgender still remained an independent significant factor in decreased well-being, whereas being of sexual minority did not. This was true for participants of both birth sexes. Independent of the effect of transgender or cisgender status on well-being, the negative effect of sex atypicality was

significant (although weak), in participants with a birth sex of male, indicating that among this group, having higher sex atypicality was linked to decreased well-being. This effect was not found to be significant in participants with a birth sex of female, indicating that higher sex atypicality does not lead to significantly decreased well-being in this group.

This partially supports findings from Rieger et. al., (2012) that sex atypicality may have a larger effect on well-being than being of sexual minority, as sexual orientation was not independently linked to well-being, and the well-being of heterosexual cisgender women was also linked to their sex atypicality levels.

The strongest effect of sex atypicality on well-being was found amongst cisgender men. This may be because, in general, sex atypicality is less accepted and tolerated among men in comparison to women (Skidmore, Linsenmeier, & Bailey, 2006). This has been found to be the case from both parents (Kane, 2006) and amongst peers in childhood, with sex atypical boys recalling increased loneliness, distress and victimisation, compared to their sex typical peers (Young & Sweeting, 2004). This may indicate that the social response and treatment from being sex atypical is important to well-being, and may be more important than a potential internal conflict between identity and expression. This could explain why no effect was found among transgender participants, as their expression would be more in line with their internal identity the more sex atypical they are. The present study only measured adulthood well-being, and as a majority of transgender participants were living as their transitioned gender (one different to their sex) at the time of completing the survey, for these participants, their sex atypicality scores were in line with their gender presentation, for the most part, therefore making them appear more sex typical in their behaviour. To explore this, the well-being of transgender people living as their transitioned gender, rather than the one that matches their birth sex, would need to be investigated in comparison to those who are not. Further to this, the effect of being sex atypical on well-being would need to be compared between these two transgender groups.

As transgender people were found to have the highest sex atypicality, it would have seemed logical for this to negatively impact their well-being, as sex atypicality has this effect among other populations (Rieger, et. al., 2008). Aside from the previously discussed reason why no link may have been found, the lack of connection between sex atypicality and well-being indicates that there could be other reasons why transgender people have lower well-being, and this needs to be investigated. These reasons could include being faced with increased discrimination (Grossman & D'Augelli, 2006), and the effect of having gender dysphoria (Coolidge, Thede, & Young, 2002). The latter is treated with hormonal therapy and surgery, which has been found to be an effective treatment (Gorin-Lazard, et al., 2013; Gijs & Brewaeys, 2007). This could be investigated by comparing the differences in well-being between transgender people who have had hormones or surgery, to those who have not, and then comparing these two groups separately to cisgender populations.

Conclusion

In summary, the present research found that being transgender is linked to increased sex atypicality (including observer rated atypicality), as well as to decreased subjective well-being. Sexual orientation was not found to have a consistent effect on sex atypicality among cisgender participants, and cisgender participants overall scored significantly lower in sex atypicality than transgender participants. Subjective well-being was also not found to be robustly affected by sexual orientation, but cisgender participants having higher well-being than transgender participants regardless of sexual orientation. Finally some effect of sex atypicality levels on well-being was found in cisgender participants, but no significant effect was found in transgender participants.

The results indicated that even from as young as 2 years old, transgender participants were more sex atypical than cisgender participants, even those of sexual minority. This finding, combined with the results showing that transgender participants had significantly lower well-being, provides an indication of the importance of early support for sex atypical children and the potential need for treatment for those with persistent gender dysphoria. This early support, and allowance of transgender children identifying as the gender they feel they are, leads to typical rates of depression, and a decrease in internalised symptoms of gender dysphoria, when compared to those who are not supported in their gender identity (Olson, Durwood, DeMeules, & McLaughlin, 2016). Importantly, the present study highlights further the need for early recognition and support for sex atypical and gender dysphoric children.

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