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Longitudinal associations between mindfulness and changes to body image in first-time parent couples

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Abstract

Pregnancy and postpartum are associated with declines in body image. Research on postpartum body image focuses almost exclusively on the person who gave birth and studies examining protective factors for postpartum body image are scarce. We assessed 257 new-parent couples from mid-pregnancy to 6-months postpartum to examine whether mindfulness—a recognized contributor to psychological well-being—buffered against declines in both partners' perceptions of mothers' body. Mothers' positive body image and partners' perception of mothers' body were collected at four time-points (second and third trimester; 3- and 6-months postpartum); both partners' mindfulness facets—observing, describing, awareness acting, non-judgement, and non-reactivity—were assessed in the second trimester. Dyadic latent growth curve modeling revealed that both partners' perceptions of mothers' body were positively correlated at all moments; however, mothers' positive body image worsened over time, whereas partners' perception of mothers' body remained stable. Mindfulness facets were positively associated with mothers' positive body image (observe, describe, and non-judging) and fathers' (non-judging) perceptions of mothers' body in pregnancy. Mothers' mindfulness facets (acting with awareness, non-judging) were associated with subsequent trajectories of their own body image. By identifying mindfulness facets as targetable protective factors during pregnancy, these findings have implications for future research and interventions focused on perinatal body image.

Keywords*: body image; mindfulness; couples; postpartum; transition to parenthood; actor-partner interdependence model

Body image—the psychological representation of one's outer appearance that encompasses behavioral, perceptual, and attitudinal components—is not stable across the lifespan but, rather, is a dynamic phenomenon that varies as physiological, psychological, and sociological changes arise (Grogan, 2008). The perinatal period (i.e., from pregnancy to one year postpartum) is among the most disruptive life events to body image, especially considering the short (40-week) time in which physical changes occur, the prominence of those alterations for the pregnant individual, and the sociocultural pressure for a quick recovery from those changes across the postpartum (Hodgkinson et al., 2014; Watson et al., 2015). Body image dissatisfaction during pregnancy is a risk factor for the later development of depression (Gjerdingen et al., 2009; Silveira et al., 2015), with women experiencing body image dissatisfaction in pregnancy being three to four times more likely to develop perinatal depression compared to those who are not dissatisfied with their body image (Elise et al., 2019; Silveira et al., 2015). Body image also shapes one's interpersonal relationships; better self-perceived body image is linked to greater intimacy and relational satisfaction and is associated with partners' positive perceptions of their partner's body (Meltzer & McNulty, 2010; Nezlek, 1999). Yet, despite ample evidence of the benefits of positive body image to individual and relational well-being, its importance during the perinatal period, and the fact that partner's perceptions may be interdependent (e.g., Mickelson & Joseph, 2012), there is a dearth of dyadic research during this time. Moreover, there is little knowledge of protective factors for body image changes across pregnancy and postpartum. The current study aimed to examine the interdependence between mothers' positive body image and partners' perceptions of mothers' body over time and to test whether mindfulness—a recognized contributor to own body image and psychological well-being—protects against declines in mothers' positive body image across this vulnerable life stage, while also considering partners'

perception of mothers' body.

Perinatal Body Image in a Relational Context

Most studies addressing body image across pregnancy and postpartum focus on negative body image, but less in known about changes to positive body image across the perinatal period. Positive body image encompasses several constructs such as being satisfied with one's body, perceiving one's body as attractive and beautiful, or feeling appreciation, love, and pride about one's body (Tylka & Wood-Barcalow, 2015). The perinatal period is a particularly challenging period for body image. Prior quantitative and qualitative research has shown that the degree of pregnant women's dissatisfaction with their body increases as pregnancy progresses, reaching its peak between 3 and 6 months postpartum (for reviews, see Fuller-Tyszkiewicz et al., 2013; Hodgkinson et al., 2014; Watson et al., 2015). Several psychological and social factors have been linked to women's emotional distress and negative perceptions of their bodies across the perinatal period, including unrealistic body ideals, perceived pressure to lose weight, and negative comments from significant others (Rallis et al., 2007; Upton & Han, 2003; Watson et al., 2015).

Theories of body image dissatisfaction, such as the Tripartite Influence Model (Thompson et al., 1999), pose that women's body dissatisfaction is influenced by three main sociocultural sources: media, peers, and family. In a recent adaptation of this model to postpartum women, the authors extended the sociocultural influence of "family" to also include close family members such as partners, which acknowledges that romantic partners also exert a key influence on women's body image dissatisfaction (Lovering et al., 2018). Indeed, one's own body image is closely related to the perception that our body is appreciated and accepted by others, including romantic partners (Hodgkinson et al., 2014; Pelican et al., 2005). Individuals

who perceive that their partner is satisfied with their bodies are more satisfied themselves (Pole et al., 2004) and, in couples, receiving positive appearance-related comments by one's partner is linked to higher body image satisfaction (Ashkinazi et al., 2022). If partners accept an individual's body, then one may feel less pressured to change their outer appearance, leading to greater acceptance of one's body as it is (Tylka & Wood-Barcalow, 2015). Consistent with the Tripartite Influence Model, a cross-sectional study found that among women who had given birth in the last year, perceiving more body-related pressure from partners was, indeed, associated with women's poorer body image during this period (Lovering et al., 2018).

Given this interdependence between partners (Watson et al., 2016), several studies have attempted to capture the influence of partners' perceptions of women's body across the perinatal period (i.e., a partner's perceptions and feelings about the pregnant/birthing individual's body). These studies have generally found that women who perceive greater pressure or receive more negative body-focused comments from their partners also report greater body dissatisfaction, both at pregnancy and at postpartum (Lovering et al., 2018; Skouteris et al., 2005). However, these studies examine women's perceptions of their partners' views through maternal reports only and have not included partner's own reports. This oversight is critical because women's perceptions of their partners' view might not correspond to partners' actual experience.

To our knowledge, only one study has examined both partners' self-reported perception of mothers' body (Mickelson & Joseph, 2012). The authors found that mothers' and partners' perceptions of mothers' body image were positively correlated, yet mothers reported, on average, being less satisfied with their own bodies than partners reported being satisfied with mothers' bodies. This was, however, a cross-sectional study that assessed couples at 9 months postpartum. Mothers' declines in body image across the perinatal period are well established (Fuller-

Tyszkiewicz et al., 2013; Rallis et al., 2007; Singh Solorzano et al., 2022), but whether mothers' self-perceived body image is associated with their partners' perceptions of their bodies over time and whether changes in mothers' and partners' perceptions follow similar trajectories is still unknown. This knowledge is important because it could have implications for partners' potential contribution to promoting mothers' body image.

Mindfulness as a Protective Factor

Some psychological factors may protect pregnant individuals from experiencing declines in their body image across the perinatal period, and mindfulness might be one of such factors. In recent decades, increasing research and clinical interest has focused on the value of mindfulness, with robust evidence recognizing its contribution for psychological well-being (e.g., lower levels of distress, anxiety, and depression, including in perinatal samples (Bränström et al., 2011; Corbally & Wilkinson, 2021; Dhillon et al., 2017). Mindfulness is a specific way of relating to one's experiences characterized by openness and acceptance (Kabat-Zinn, 2003), and has been described as the "awareness that emerges through paying attention on purpose (…) and nonjudgmentally to the unfolding of experience moment by moment" (Kabat-Zinn, 2003, p. 145). Mindfulness can be seen as a state, but several scholars have proposed that mindfulness can also be considered as a trait-like variable, such that individuals may inherently differ in their tendencies toward mindful versus mindless states (Brown & Ryan, 2003). Mindfulness comprises five distinct, interrelated sets of skills, or facets (Baer et al., 2006, 2008): observing (i.e., the tendency to notice one's experiences), describing (i.e., the ability to verbally label internal experiences such as feelings and thoughts), acting with awareness (i.e., the capacity to attend to present-moment experiences without acting automatically), non-judgement (i.e., the likelihood of attending to one's experiences without judgement), and non-reactivity to inner

experience (i.e., the ability to attend to inner experiences without necessarily reacting to them). These skills are modifiable with practice (Kiken et al., 2015; Quaglia et al., 2016), thus being potentially relevant targets for intervention.

In community samples, mindfulness skills have been positively linked to body image satisfaction (Dekeyser et al., 2008; Dijkstra & Barelds, 2011; Pidgeon & Appleby, 2014). In particular, greater capacity for describing, acting with awareness, and acceptance of experiences without judgment have all been associated with more positive body image, whereas the facets related to observing and non-reactivity have shown inconsistent results, either being negatively linked to body image outcomes (observing) or showing non-significant links (observing, non-reactivity) (Barrington & Jarry, 2019; Dekeyser et al., 2008; Prowse et al., 2013). Across the perinatal period, where body image concerns become more salient, mindfulness aspects such as the ability to accept one's experiences without judgement may be particularly beneficial for body image. Although to our knowledge this facet has not been tested in a quantitative study, in qualitative studies women describe the ability to not judge one's experiences against unrealistic sociocultural standards (e.g., regarding attractiveness, weight, or how soon one's postpartum body should return to its prepregnancy shape) as an important contributor to better body image experiences during this period (Watson et al., 2015, 2016). Pregnant women also engage more frequently in self-oriented comparison than women who are not pregnant (Thompson & Bardone-Cone, 2022). Indeed, women who endorse a positive body image are likely to filter information (e.g., appearance commentaries, sociocultural ideals) in a body-protective manner (Wood-Barcalow et al., 2010) and, in pregnancy, women report feeling more anxious when perceiving that they are not meeting others' weight gain/loss expectations (Hodgkinson et al., 2014). This skill might also be critical across this period given that a central aspect of perinatal

body image dissatisfaction is the perceived loss of control over one's body. Pregnant women who feel they have no control over their bodily changes report higher psychological distress (Carter, 2010; Upton & Han, 2003; Watson et al., 2015). As such, being able to accept one's experiences without judgement might be beneficial to prevent marked declines in body image from pregnancy to postpartum. These findings point towards the relevance of the non-judgement mindfulness facet for perinatal body image experiences. However, prior research used qualitative approaches only and did not assess the non-judgement mindfulness facet directly. In addition, all five mindfulness facets have not previously been examined together in a perinatal sample for their associations with body image; the question of whether other facets might also shape body image across this period is still unanswered.

The Current Study

Despite established associations between mindfulness and body image, no study has directly examined them in the perinatal context, a period of heightened body image concerns. Examining these associations across pregnancy and postpartum has relevant clinical implications by examining the potential role of mindfulness facets as targetable and modifiable factors to promote positive perinatal body image. Moreover, examining potential dyadic influences in couples (i.e., effects of own and partners' experiences) could help identify additional sources of support for postpartum women (Karl & Fischer, 2022). Thus, the aims of the current study were to establish the interdependence between mothers' own positive body image and partner's perception of mothers' body across the transition to parenthood and to investigate mindfulness as a protective factor for worsening body image across the perinatal period. In the current study, each facet of mindfulness was tested as a predictor of mothers' own positive body image and partners' perception of mothers' body at pregnancy as well as longitudinal changes in these

perceptions from second trimester, third trimester, 3-, and 6-months postpartum.

We hypothesized that: H1a) Mothers' positive body image reports and partners' perceptions of mothers' body would be significantly and positively correlated from pregnancy to postpartum and H1b) Mothers' positive body image would significantly worsen (i.e., negative slopes) from pregnancy to 6-months postpartum. Regarding partners' slope, we examined whether partners' perception of mother's body over time also declined in an exploratory way given lack of prior research. H2a) We hypothesized that at baseline (i.e., second trimester), mothers' and partners' own higher non-judgement mindfulness would be linked to more positive body image perceptions (actor effects for both partners' intercepts); and H2b) Over time, higher non-judgement (as measured at baseline) would predict both partners' better body image trajectories (i.e., slower declines) from mid-pregnancy to 6-months postpartum. We examined whether there are partner/interpersonal effects (i.e., partner's non-judgement mindfulness being linked to mothers' positive body image) in an exploratory manner, given the absence of prior dyadic research examining the contribution of mindfulness to body image in couples. Given prior mixed evidence regarding the contribution of the remaining mindfulness facets to body image, we assessed these links in an exploratory manner.

Methods

Participants

We recruited couples in the transition to parenthood at mid-pregnancy (between 20 and 24 weeks, $M = 22.8$ weeks, $SD = 1.48$) as part of a larger study on couples' experiences across the transition to parenthood, some results of which have been published (Fernandes et al., 2022; Tavares et al., 2021; Tavares et al., 2022a; Tavares et al., 2022b). None of the previously published manuscripts examined couples' mindfulness nor body image. Eligibility criteria for the

study required that both members of the couple were over 18 years of age, in a committed relationship with each other for at least six months, and able to read and write in Portuguese. The pregnant partner was required to have not given birth previously and currently have an uncomplicated and singleton pregnancy. Exclusion criteria included currently suffering from a (self-reported) severe and unmanaged medical or psychiatric illness. The final sample comprised 257 first-time expectant couples who ranged in age from 19 to 47 years old (mothers: $M = 29.92$, $SD = 4.74$; fathers: $M = 31.61$, $SD = 4.87$), see Figure 1 for flow of recruitment. All participants who gave birth self-reported their gender/sex as woman/female and all partners self-identified as man/male; we therefore refer to these participants collectively as "mothers" and "fathers", respectively. Although the study was advertised as inclusive of couples of all genders and identities, all participants were currently in a mixed-gender/sex relationship. Most couples were married or common-law (68%) and 32% of couples were dating. Relationship duration was on average 7 years, ranging from 6 to 255 months ($M = 87.5$ months, $SD = 55.5$ months). Nearly 7% of mothers and 15% of fathers completed 9 years of education, 32% of mothers and 42% of fathers completed 12 years of education, whereas 61% of mothers and 43% of fathers had some form of higher education. Monthly household income ranged from less than €1,050 (27% of mothers, 20% of fathers), 1,050€–2,095€ (49% of mothers, 55% of fathers), to over 2,095€ (24% of mothers, 25% of fathers).

Procedure

The present research received approval from the ethical review boards at the University of Porto and at the Centro Materno-Infantil do Norte. Couples were recruited from June 2018 to March 2020 using two main sources: either in-person at regularly scheduled clinical appointments to gynecologists in an obstetrics outpatient unit (81%) or via community (i.e.,

pregnancy-related services, hospital bulletin boards) or online advertisements (19%). All

individuals provided informed consent online before participating. Participants recruited through

advertisements completed all materials online, whereas participants enrolled in the obstetrics

outpatient unit were recruited through gynecologists' referral. After the study was described to

potential participants, those who were interested and eligible were invited to complete the first

survey online, which was sent to both partners separately to their own email addresses. Data

were obtained from both couple members at two time-points in pregnancy (20-week, T1, and 32-

week pregnant, T2) and at two time-points postpartum (3-months, T3, and 6-months postpartum,

T4). Mothers and fathers reported on sociodemographic information and on mindfulness facets at

baseline; mothers reported on their own body image and fathers reported on their perceptions of

mothers' body at all time-points. After receiving each survey, couple members were instructed to

complete their surveys independently from each other and within 4 weeks. To promote couples'

longitudinal participation, retention strategies included reminder phone calls and reminder

emails. Couples received a 10€ gift card at every other time-point as compensation for

completing the study.

Measures

     Mindfulness. The well-validated 15-item Five Facets Mindfulness Questionnaire (FFMQ;

Baer et al., 2006; Gu et al., 2016) measures the five interrelated facets of mindfulness: observing,

describing, acting with awareness, non-judgement, and non-reactivity to inner experience.

Items are rated on a 5-point Likert scale, ranging from 1 (*never or very rarely true*) to 5 (*very*

often or always true), with higher scores indicating greater mindfulness (range 3 to 15 for each

facet). Internal consistency for the five facet scores in this study was in line with the scale

original validation study (Gu et al., 2016): observing: $\alpha_{mothers} = .61$, $\alpha_{fathers} = .67$; describing:

$\alpha_{mothers}$ = .70, $\alpha_{fathers}$ = .69; acting with awareness: $\alpha_{mothers}$ = .79, $\alpha_{fathers}$ = .72; non-judgment:

$\alpha_{mothers}$ = .79, $\alpha_{fathers}$ = .71; non-reactivity: $\alpha_{mothers}$ = .71, $\alpha_{fathers}$ = .76.

Body image. We used the 12-item body image subscale of the Maternal Adjustment and

Maternal Attitudes Questionnaire (MAMA; Kumar et al., 1984), a reliable self-report measure

specifically designed to assess adjustment during pregnancy and postpartum across several

dimensions, including positive body image. Mothers reported on the maternal version of the

scale and were asked to rate their own body image in the last four weeks (e.g., "Have you felt

attractive?", "Have you liked the shape of your body?"). As is common practice in dyadic studies

(e.g., Santos-Iglesias et al., 2018), we modified the MAMA slightly such that fathers reported on

the same scale, but were asked to report on how they perceived mothers' bodies (e.g., "Have you

felt your partner was attractive?", "Have you liked the shape of your partners' body?"). Items

used a 4-point Likert scale, ranging from 1 (*never*) to 4 (*very often*); total scores range from 12 to

48 with higher scores signaling greater body image/perceptions of body. Good internal

consistency was found in this sample across time-points for both partners ($\alpha_{mothers}$ = .83–.87;

$\alpha_{fathers}$ = .81–.88).

Data analysis

We performed all statistical analyses using *MPlus* v8.7. Prior to calculating total scores

and given that the proportion of missing items within scales was minimal (<1%) and missing

completely at random (Little's MCAR test $p > 0.05$), we applied maximum likelihood imputation

for these missing items (Newman, 2003). To explore whether there were any factors related to

attrition of participants over time, we created a dichotomous variable for dropout at T2, T3,

and/or T4 and performed binomial logistic regressions with T1 demographic variables and

predictor and criterion variables. Attrition of participants over time was not significantly linked

with any T1 variable—sociodemographic, criterion or predictor—examined in this study. As such, missing data for longitudinal assessments were assumed to be missing at random (MAR). We used a full information maximum likelihood approach to account for missing data due to attrition over time (Enders & Bandalos, 2001).

We first established average dyadic trajectories of body image across the transition to parenthood using unconditional dyadic latent growth curve modeling (DLGCM; Jung & Wickrama, 2008) within a structural equation model (SEM). This unconditional model permitted us to estimate the latent intercept for mothers' own and father's perception of mothers' body image at baseline (mid-pregnancy) and their average trajectory over time (i.e., slope). Given the dyadic nature of the data, DLGCMs were tested within an Actor-Partner Interdependence Model (APIM; Kenny et al., 2006) to account for the covariance (i.e., interdependence) between the growth factors (i.e., intercepts and slopes). The use of APIM enabled us to test actor (i.e., associations between own mindfulness facts and own change in body image reports) and partner (i.e., associations between partners' mindfulness facets and change in own body image reports) effects. Partners were distinguished based on the person who gave birth (i.e., mother) and the person who did not give birth (i.e., the father). Time frame was weighted across time-points with the intercept representing the first time-point (0, 3, 8, 11; assessed in months); the slope value thus indicates the unit change in body image per month between baseline (mid-pregnancy) and T4 (6-months postpartum). Significant differences between mothers and fathers for intercepts and slopes were tested using Wald χ^2 tests within the DLGCMs. Good model fit was assessed based on several fit indices: a Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) $\geq$ 0.95, a Root Mean Square Error of Approximation (RMSEA) $\leq$ 0.06, SRMR (Standardized Root Mean Squared Residual) $\leq$ 0.08, and a statistically non-significant Chi-Square value (Hu &

Bentler, 1999); adequate model fit was indicated by less stringent criteria (e.g., CFI ≥ 0.90, TLI ≥ 0.90, and RMSEA ≤ 0.08; Marsh et al., 2004). After having identified the average dyadic trajectories for body image, mindfulness facets were then entered into a single conditional model as time-invariant predictors of mothers' and fathers' body image intercepts and slopes. De-identified data and syntax for the analyses are available on the Open Science Framework at https://osf.io/2fnv4/.

Results

Descriptive statistics and correlations among study variables are presented in Table 1.

Dyadic Interdependence and Changes in Body Image from Pregnancy to Postpartum

As anticipated, mothers' and fathers' reports of mothers' body were significantly positively correlated at all time-points (r_s = .20–.24, p_s < .01), supporting interdependence between partners' perceptions. The unconditional DLGCM provided acceptable-good fit indices: $\chi^2(18) = 42.12$, $p < .001$; CFI = 0.97; TLI = 0.96; RMSEA = 0.07, SRMR = 0.06. At baseline, mothers had poorer body image than fathers' report of mothers' bodies, Wald $\chi^2(1) =$ 239.24, $p < .001$. Mothers' body image significantly worsened from pregnancy to 6-months postpartum, whereas fathers' perception of mothers' bodies did not change over time (see Figure 2). Consistently, body image slopes were significantly different between partners, Wald $\chi^2(1) =$ 62.73, $p < .001$. Mothers' rate of change in body image over time was not related to their own nor to fathers' intercept at baseline, indicating that the longitudinal declines were not dependent on own nor fathers' initial perceptions of mothers' bodies (see Table 1).

Mindfulness Facets as Predictors of Changes in Mothers' Positive Body Image

Mothers' and fathers' mindfulness facets scores at baseline (observing, describing, awareness acting, non-judgement, and non-reactivity) were included in a dyadic conditional

LGCM as time-invariant predictors of mothers' own body image and fathers' perceptions of mothers' body at baseline (i.e., intercepts) and to mothers' longitudinal trajectories from mid-pregnancy to 6-months postpartum (i.e., slope) (see Table 2). The conditional DLGCM showed acceptable to good fit to the data: $\chi^2(62) = 108.03$, $p < .001$; CFI = 0.95; TLI = 0.92; RMSEA = 0.05, SRMR = 0.04. As previously reported, fathers' slope showed no significant change, precluding estimation of effects of mindfulness facets on their own perceptions of mother's body over time. Mothers' greater capacity for observing, describing, and non-judgement of their inner experiences were significantly linked to a more positive perception of their own body image at baseline (actor effect, intercept), whereas awareness acting and non-reactivity showed non-significant links. Fathers' greater capacity for non-judgement was significantly associated with a more positive perception of mothers' body at pregnancy (actor effect, intercept), whereas the other facets (observing, describing, awareness acting, and non-reactivity) showed non-significant links. Further, mothers with greater capacity for acting with awareness showed slower declines in their own body image over time (actor effect), whereas mothers with greater capacity for non-judgement showed faster declines in their own body image over time. The facets of observing, describing, and non-reactivity did not significantly predict mothers' body image trajectory over time. Only actor, and not partner effects, were observed.

To control for the potential impact of actual weight on the current results, we added weight gain as a covariate to the conditional model; all significant results were maintained (syntax and results for this supplemental analysis can be found in the OSF page).

Discussion

Among several physical and psychological changes that occur during the perinatal period, changes to the pregnant individual's body shape and weight put them at heightened vulnerability

for body image concerns (Fuller-Tyszkiewicz et al., 2013; Hodgkinson et al., 2014; Watson et al., 2015). In this study, we used a prospective cohort of first-time parents followed from mid-pregnancy until 6-months postpartum. Our goal was to examine changes in mothers' positive body image and fathers' perception of mothers' body and whether mindfulness—a factor recognized to promote psychological well-being and which has been linked to positive body image (Bränström et al., 2011; Pidgeon & Appleby, 2014)—buffered against declines in positive body image across the perinatal period. Overall, we found an average decline in mothers' own self-perceived positive body image from pregnancy through 6 months postpartum, whereas fathers' perception of mothers' body remained stable across this same period. In line with expectations regarding the positive value of mindfulness, we found that mothers and fathers' who reported greater mindfulness skills (i.e., mothers' observing, describing, and non-judgement, and fathers' non-judgement) at baseline (mid-pregnancy) concurrently reported a more positive body image and better perception of their partners' body at pregnancy, respectively. Notably, the subsequent course of change in mothers' positive body image over time was predicted by their own mindfulness skills of non-judgement and awareness acting at baseline, yet these associations were of small magnitude and showed some paradoxical effects longitudinally (i.e., non-judgement).

Mothers' positive body image declined, on average, from pregnancy to 6-months postpartum, with the lowest self-perceived positive body image being reported at 3-months postpartum. Given the variety of changes associated with childbirth and physical recovery from pregnancy, it is not surprising that the immediate postpartum is the most challenging period for mothers, as has been established in prior research (Hodgkinson et al., 2014; Rallis et al., 2007; Skouteris et al., 2005; Watson et al., 2016). Prior studies have not examined fathers' reports of

mother's body across this period. To overcome this gap, we assessed fathers' perceptions and attitudes towards woman's bodies from pregnancy to postpartum, which allowed us to examine the links between couple members' perceptions. Findings revealed that mothers' and fathers' perceptions of mothers' bodies were positively linked at all time-points, yet fathers' perceptions were more positive than mothers' own self-perceptions at all time-points, which replicates the only prior cross-sectional study that also assessed this association (Mickelson & Joseph, 2012). When looking at change over time, we found that, in contrast to mothers, fathers did not change their perceptions of women's body from pregnancy to postpartum. Given the importance of partners to women's body dissatisfaction, as postulated by the Tripartite Influence Model (Lovering et al., 2018; Thompson et al., 1999), these findings highlight that partners could serve as critical sources of support to mothers during this period.

Given that most studies to date focus on negative correlates of perinatal body image (Fuller-Tyszkiewicz et al., 2013), a central goal of this study was to examine the potential protective role of mindfulness against declines to positive body image in mothers. We found that several mindfulness facets were concurrently associated with mothers' own more positive body image (observe, describe, and non-judging) and fathers' (non-judging) better perceptions of mothers' body in pregnancy, with moderate to large effect sizes (.33—.91; Acock, 2014). Prior research with a community sample of women suggested that greater dispositional mindfulness is linked to higher body satisfaction (Dijkstra & Barelds, 2011), but this study assessed mindfulness as a global construct, hampering a more nuanced understanding of particular mindfulness facets. The current results expand prior research by indicating that specific facets (i.e., mothers' observing, describing, and non-judgement, and fathers' non-judgement) are linked to better body image in pregnancy (i.e., when assessed together at this particular point in time)

and that distinct facets are relevant for each member of the couple. For mothers' specifically, the current findings also give support to a parallel line of research showing that greater acceptance and compassion toward one's own experiences might protect women against body-related concerns across the perinatal period, such as restraint, shape, and weight concerns (Baskin et al., 2021).

Because we assessed both couple members' perception of the women's body, we were able to detect an association between fathers' non-judgement skills and more positive perceptions of their partners' body. Fathers who have a greater capacity of not judging their own experiences may be more likely to interpret mothers' pregnancy-related body changes as part of the natural course of pregnancy and postpartum, resulting in more positive perceptions and feelings towards their partners' bodies. This is relevant given that the way fathers perceive mothers' body contributes importantly to mothers' own greater self-perceptions of their own bodies, as previously discussed (Lovering et al., 2018; Thompson et al., 1999).

When looking at these effects over time, we found that women in this study who reported a greater tendency to act with awareness (i.e., the ability to engage in actions that are aligned with their present-moment experiences) experienced slower decreases in their positive body image over time, which was in line with our expectations. The ability to act with awareness to present-moment experiences is associated with other important skills such as better identification and description of feelings and less social anxiety (Dekeyser et al., 2008), which can altogether facilitate the maintenance of positive body image for mothers across a vulnerable period such as the transition to parenthood.

Conversely, mothers who endorsed better non-judgement skills in pregnancy demonstrated a more rapid decrease in their own positive body image over time. This result was

counter to our hypothesis and, although significant, was of a small magnitude (–.06). In pregnancy, women reported, on average, fairly high levels of non-judgement and, at this point, non-judgement was indeed linked to more positive body image, as mothers might interpret their body changes as positive consequences of being pregnant (i.e., being healthy, growing a human; Hodgkinson et al., 2014; Watson et al., 2015). However, after the baby is born it is common for women to experience psychological distress (i.e., more negative emotions and thoughts) related to their postpartum bodies specifically (Fuller-Tyszkiewicz et al., 2013; Gjerdingen et al., 2009), which might make it harder for them to accept their considerable bodily transformations without judgement. If new mothers expect their bodies go back to pre-pregnancy quickly and this expectation is not met (i.e., they continue to have body image concerns with their postpartum body), then they can have more trouble maintaining a non-judgemental attitude. In our study, we only assessed non-judgement in pregnancy, but if women also report a decline in non-judgement postpartum, then this decline could be happening concurrently with decreased body image. This hypothesis would need to be tested in future longitudinal research.

Still, we note that the effect sizes for these longitudinal effects were smaller compared to the cross-sectional effects, which exert a more proximal influence on pregnant women's body image. The smaller longitudinal effect sizes may be due to the myriad of factors contributing to changes in positive body image over time. As this is the first study to explore the longitudinal associations of mindfulness facets and body image in perinatal women, researchers should replicate these findings in future research, while also considering potential moderators (e.g., mothers' depressive and anxiety symptoms).

As for whether an individual's mindfulness skills are relevant for the other partners' views of mothers' body, we did not find support for these interpersonal effects cross-

sectionally or longitudinally. The current findings support the conceptualization of mindfulness as a relevant intrapersonal factor that facilitates processing of our own (but not a partners') internal reactions to challenging experiences (Kabat-Zinn, 2003), such as pregnancy-related body changes. Also, this was the first study that assessed the differential role of mindfulness facets to perinatal body image. Thus, we identified particular facets—observing, describing, non-judging, acting with awareness—that may be most relevant to mothers' and fathers' views of mothers' body in the perinatal period.

Current results hold relevant clinical implications, as pregnancy is an opportune time to screen for risk and protective factors for body image (Hodgkinson et al., 2014). One potential avenue for prevention might be the promotion of greater mindfulness skills. Integrating the practice of mindfulness in third-wave cognitive behavioral interventions is increasingly common and has shown benefits for a range of psychosocial outcomes, including with perinatal samples (Corbally & Wilkinson, 2021; Dhillon et al., 2017). Clinicians can provide couples with education about natural, physical changes to the body after birth (e.g., it may take some time for the stomach to lose its round shape) and challenge less adaptive weight and appearance related cognitions (e.g., losing gestational weight is necessary to be attractive), while practicing a mindful attitude of acceptance, rather than judgement of their experiences (e.g., against societal expectations). The current findings also reinforce that partners might be a valuable resource in discussions around perinatal body image. As they are likely to view mothers' bodies more positively during this time of change, it might be worthwhile to include partners in these discussions, for example by promoting ways in which they can positively support the pregnant/birthing partner (e.g., showing that they value their bodies as they are). For instance, partners could be encouraged to express gratitude for mothers' ability to grow a human being

and to provide validation regarding the common yet potentially distressing body changes their partner may experience during pregnancy.

Despite these novel findings, the current study has some limitations. We focused on first-time expectant couples, as this is the first time that these couples are confronted with pregnancy- and postpartum-related physical changes. Whether these findings would replicate to couples who are not experiencing pregnancy for the first time would be of use to examine in the future. Also, the current sample was representative of the demography of the Portuguese population having a first child (viz., regarding age, marital, and socioeconomical status; INE, 2011), but it included a large proportion of couples who were white/Caucasian. Also, all couples were in mixed-sex/gender relationships, despite attempts to recruit a more diverse sample. Future research is encouraged to extend this work to more diverse samples in terms of sexual, racial/ethnic, socio-economic, and obstetric (e.g., multiparity) characteristics. Finally, to the best of our knowledge there are no existent tools that assess both partners' perceptions of the pregnant/birthing individual's body image and that can be used in dyadic analysis (i.e., comprise the same items). We therefore adapted a validated measure of pregnant/postpartum women's positive body image to assess their partners' perceptions, yet this measure has not been formally validated. This measure assesses distinct aspects of positive body image such as perceived attractiveness, body image satisfaction, and appreciation toward one's body, which are all cornerstone facets of positive body image (Tylka & Wood-Barcalow, 2015), but does not capture other cognitive (e.g., filtering information in a body-protective manner) or behavioral aspects (e.g., adaptive appearance investment), nor does it capture negative body image. Future studies might examine these additional facets to provide more nuanced information about their potential links with mindfulness across the transition to parenthood.

Still, the current study findings add to the limited research on protective factors for perinatal body image. In addition, we provided novel evidence of how partners' perception of mothers' body remains stable over time and is linked to mothers' own positive body image. Besides postpartum women's own characteristics (e.g., mindfulness skills) and perceptions of their own bodies, their partners perceptions also need to be considered in theoretical models and in interventions, given its critical influence on individual outcomes such as body image (Lovering et al., 2018). Our findings highlight that individual and partners' mindfulness skills can be a relevant target of future studies and clinical efforts aimed at understanding changes to perinatal body image.

Acknowledgments

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Couples completed
screening
$N = 431$

Couples screened but not
enrolled
$N = 117$
Ineligible
- Not first child ($n = 4$)
- Relationship length < 6
  months ($n = 5$)
- < 18 years old ($n = 1$)
- > 24 weeks gestation ($n = 7$)
- Other (multiple pregnancy,
  medical illness not well-
  managed, inconsistent
  responses between partners; n
  $= 18$)

Uninterested
- Lost to follow-up ($n = 55$)
- Other (e.g., declined due to
  time commitment, one
  partner not interested; $n =$
  27)

Withdrawn at baseline
(20 weeks)
$N = 53$
- Pregnancy loss ($n = 2$)
- Did not complete
  baseline survey/only one
  partner completed
  baseline ($n = 51$)

Couples enrolled
$N = 314$

Couples completed the
baseline survey
$N = 261$

Withdrawn after baseline
$N = 4$
- Stillbirth ($n = 1$)
- Relationship dissolution
  ($n = 2$)
- Invalid/inattentive
  responders ($n = 1$)

Couples included in current
analysis
$N = 257$

T1	T2	T3	T4
$N_{mothers} = 257$	$N_{mothers} = 238$	$N_{mothers} = 204$	$N_{mothers} = 188$
	retention rate = 92.6%	retention rate = 79.4%	retention rate = 73.2%
$N_{partners} = 257$	$N_{partners} = 220$	$N_{partners} = 175$	$N_{partners} = 168$
	retention rate = 85.6%	retention rate = 68.1%	retention rate = 65.4%

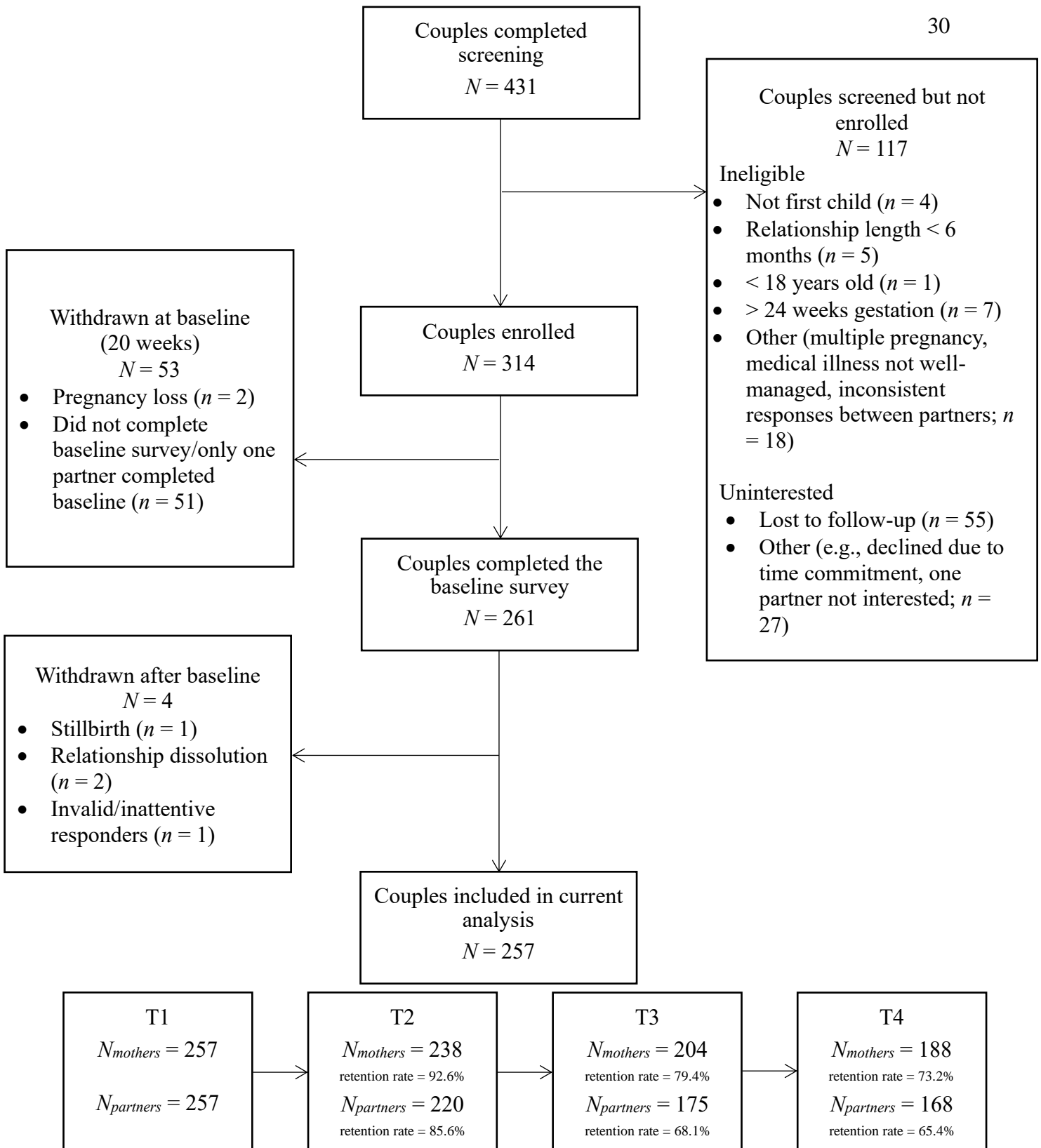*Figure 1.* Couples' recruitment flow.

Table 1

Descriptives and correlations among the study variables (N = 257 couples)

	Variable	1	2	3	4	5	6	7	8	9
1.	OBS (T1)	.18**	.02	-.22**	-.15*	.31**	.09	.18**	.03	.01
2.	DES (T1)	.17**	.09	.20**	.33**	.17**	.31**	.29**	.13	.20**
3.	AA (T1)	-.12	.25**	.09	.45**	-.24**	.13**	.05	.11	.18**
4.	NJ (T1)	-.17**	.18**	.46**	.21**	-.16**	.43**	.28**	.17*	.23**
5.	NR (T1)	.28**	-.01	-.22**	-.27**	.05	-.03	.07	-.04	-.06
6.	BI (T1)	-.02	.13*	.22**	.25**	-.01	.20**	.73**	.64**	.63**
7.	BI (T2)	.03	.19**	.19**	.21**	.02	.69**	.24**	.68**	.62**
8.	BI (T3)	-.04	.09	.22**	.25**	-.01	.63**	.68**	.24**	.78**
9.	BI (T4)	-.02	.04	.22**	.13	.01	.50**	.63**	.75**	.23**
	Mothers' *M*	8.71	10.96	10.92	12.44	8.36	37.10	36.16	32.88	33.64
	Mothers' *SD*	2.55	2.34	2.41	2.28	2.88	5.44	5.67	6.10	6.46
	Partners' *M*	7.47	10.05	11.13	12.48	7.84	42.85	42.43	42.48	42.49
	Partners' *SD*	2.70	2.60	2.40	2.27	3.01	4.20	4.49	4.65	4.92

Note. Values on the diagonal represent within-dyads correlations, values above the diagonal represent within-mothers correlations, and values below the diagonal represent within-partners correlations. T1 = 20 weeks-pregnancy, T2 = 32-weeks pregnancy, T3 = 3-months postpartum, T4 = 6-months postpartum, OBS = observing, DES = describing, AA = aware actions, NJ = non-judgement, NR = non-reactivity, BI = body image.

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

Table 2

Unconditional DLGCM means, variances, and standardized coefficients for APIM relationships among mother's body image and fathers' perception of mothers' body (N = 257 couples)

	Means	Variances	Mothers' intercept	Mothers' slope	Fathers' intercept	Fathers' slope
Body image						
Mothers' intercept	**37.12 (0.33), [36.47,37.77]***	**23.20 (2.63), [18.05,28.35]***	—	–.10 (0.12), [–0.58,0.25]	**.33 (0.08), [2.91,8.73]***	.04 (0.12), [–0.28,0.37]
Mothers' slope	**–.38 (0.04), [–0.45,–0.31]***	**0.11 (0.03), [0.06,0.17]***		—	–.11 (0.12), [–0.43,0.15]	.21 (0.17), [–0.01,0.05]
Fathers' intercept	**42.79 (0.26), [42.29,43.30]***	**13.40 (1.60), [10.27,16.53]***			—	–.02 (0.18), [–0.47,0.08]
Fathers' slope	–.03 (0.03), [–0.09,0.03]	**0.09 (0.02), [0.05,0.12]***				—

Note. DLGCM = dyadic latent growth curve model. APIM = actor-partner interdependence model We tested a series of increasingly complex growth models (i.e., linear, quadratic) and selected the optimal type of trajectory based on evidence of best model fit. The unconditional quadratic DLGCM did not converge; therefore, we present the linear DLGCM solution. 95% confidence intervals are shown between squared brackets.
*** $p < .001$

Table 3

Standardized coefficients for the conditional DLGCM with mindfulness facets on body image (N = 257 couples)

	BI Mothers' intercept	BI Mothers' slope	BI Fathers' intercept	BI Fathers' slope
	Beta (S. E.), [CI]	Beta (S. E.), [CI]	Beta (S. E.), [CI]	Beta (S. E.), [CI]
OBS Mothers	**.41 (0.12), [0.17,0.65]****	–.02 (0.01), [–0.05,0.01]	.08 (0.11), [–0.13,0.29]	–.01 (0.01), [–0.03,0.02]
OBS Fathers	–.07 (0.12), [–0.30,0.16]	–.01 (0.01), [–0.03,0.02]	–.01 (0.10), [–0.21,0.18]	–.01 (0.01), [–0.02,0.02]
DES Mothers	**.48 (0.14), [0.21,0.75]****	–.01 (0.02), [–0.04,0.02]	.04 (0.12), [–0.19,0.28]	–.01 (0.01), [–0.03,0.02]
DES Fathers	.21 (0.12), [–0.02,0.44]	–.01 (0.01), [–0.04,0.02]	.17 (0.10), [–0.03,0.37]	–.01 (0.01), [–0.03,0.02]
AA Mothers	–.21 (0.14), [–0.48,0.06]	**.04 (0.02), [0.01,0.07]***	–.13 (0.12), [–0.37,0.11]	**.03 (0.01), [0.01,0.06]***
AA Fathers	.07 (0.14), [–0.21,0.34]	–.01 (0.02), [–0.04,0.03]	.19 (0.12), [–0.04,0.43]	.01 (0.01), [–0.02,0.04]
NJ Mothers	**.91 (0.15), [0.61,1.20]*****	**–.06 (0.02), [–0.10,–0.02]****	.11 (0.13), [–0.15,0.36]	–.01 (0.02), [–0.03,0.03]
NJ Fathers	–.16 (0.15), [–0.46,0.13]	0.01 (0.02), [–0.02,0.05]	**.33 (.13), [0.08,0.58]***	–.01 (0.02), [–0.04,0.02]
NR Mothers	–.10 (0.11), [–0.32,0.12]	–.01 (0.01), [–0.03,0.02]	–.02 (0.10), [–0.21,0.17]	.01 (0.01), [–0.02,0.03]
NR Fathers	–.17 (0.11), [–0.38,0.03]	0.01 (0.01), [–0.02,0.03]	.09 (0.09), [–0.08,0.27]	–.01 (0.01), [–0.02,0.02]

Note. DLGCM = dyadic latent growth curve model, BI = body image, OBS = observing, DES = describing, AA = aware actions, NJ = non-judgement, NR = non-reactivity, S. E. = standard error, CI = 95% confidence interval.
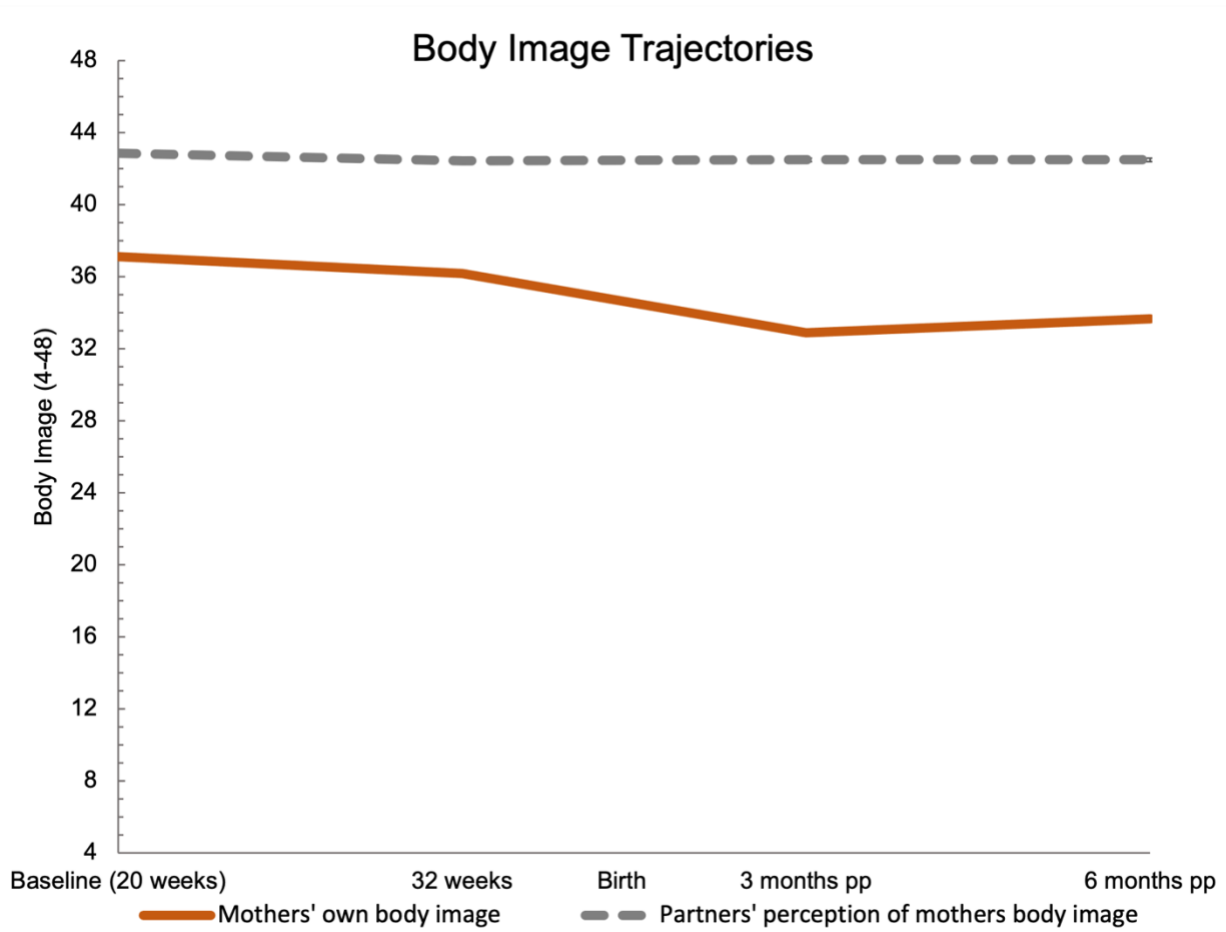
* $p < .05$, ** $p < .01$, *** $p < .001$

Figure 2. Trajectories of body image from midpregnancy to 6-months postpartum for mothers and partners.