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The relationships between objective and subjective ratings of disfigurement severity, and psychological adjustment

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Abstract

Although the role of the objectively and subjectively rated severity of appearance problems is often debated, the impact of severity upon psychological adjustment has yet to be explored fully. In this study, 400 patients with a range of physical differences in appearance were recruited through general plastic surgery outpatient clinics and waiting lists. Patients completed the Derriford Appearance Scale 24 (DAS24), a measure of psychological distress and behavioural dysfunction related to self-consciousness of appearance. Severity in the outpatient group was objectively rated by plastic surgeons, and severity amongst the waiting-list group was subjectively rated by the patients themselves. Multiple regression modelling demonstrated a linear relationship between subjective adjustment and severity, with greater perceived severity associated with poorer adjustment. Similar modelling demonstrated a weak but statistically significant quadratic relationship between objectively rated severity and adjustment for normally visible, but not for normally non-visible differences of appearance. Moderate, rather than mild or severe objective severity was most related to poor adjustment.

Keywords: Disfigurement; Body image; Severity; Visibility; Psychosocial adjustment

Introduction

Living with an altered appearance can have a profound impact on those affected. For example, between 30 and 50% of 650 consecutive hospital outpatients with a range of disfiguring conditions reported levels of anxiety, social avoidance, and quality of life that were cause for concern (Rumsey, Clarke & Musa, 2002). Nevertheless, it is important to remember that many people adapt well (Rumsey, 2002; Partridge, 1990). The cultural, social and psychological factors impacting on adjustment are only beginning to be comprehensively modelled (e.g., Endriga & Kapp-Simon, 1999; Moss, 1997a; Rumsey & Harcourt, 2004).

Intuitively, one may expect the objective severity of a disfiguring condition to be related to psychosocial adjustment. It is reasonable to expect that a person with extensive scarring, for example, may experience greater difficulty than a similar person with fewer scars. Anecdotal accounts are consistent

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with this position (e.g., Bernstein, 1982; Thomas, 1990). MacGregor's (1970) observation that in her clinical experience, people with mild disfigurement may have more difficulty adjusting than those with more severe disfigurements is often cited. The scientific evidence to support these claims is less clear. Pruzinsky (1992) has suggested that greater disfigurement may be associated with greater psychosocial social risk, although there is greater weight of evidence seemingly refuting any relationship.

Empirically, the lack of any clear relationship between psychosocial adjustment and severity seems to be supported by studies focussing on a number of different appearance related conditions. For example, no relationship between severity and adjustment has been demonstrated in studies in head and neck cancer (Baker, 1992), burns (Williams & Griffiths 1991), general physical impairment (Harper, Richman, & Snider, 1980), psoriasis (Fleischer et al., 1996), vitiligo (Thompson, Kent, & Smith, 2002), or craniofacial disfigurement (Sarwer et al., 1999; Sarwer, Whitaker, & Bartlett, 2001).

However, these studies need to be regarded cautiously. Typically, they have used either linear regression or correlation to examine the relationship between severity and adjustment, or alternatively, made a comparison of levels of adjustment between a 'low severity' and 'high severity' groups. The implicit assumption in these designs is of a linear relationship between adjustment and severity. This is not justified by recourse to any strong theoretical perspective, and it is important to consider alternative models.

Subjective ratings of severity of a disfiguring condition go to the heart of what Cash (1990) has called the ''inside view'' of appearance, and is fundamental to any conception of disfigured body image. The role of subjectively rated severity in relation to psychological adjustment in disfigured individuals has been less often examined than objective ratings. Rumsey & Harcourt (2004) describe anecdotal observations of a clear linear relationship between subjective severity and adjustment. Such a relationship is implicit within social-cognitive theorising (Moss & Carr, 2004) and practice (Kleve, Rumsey, Wyn-Williams, & White, 2002). However, at present, there is little clear empirical evidence to support or refute these assumptions. The aim of the current research was to examine the nature of any relationships which may exist between psychological adjustment and both objectively and subjectively rated disfigurement.

Method

Materials

Psychological adjustment

Participants completed the Derriford Appearance Scale 24 (DAS24) (Carr, Moss, & Harris, in press; Moss, Harris & Carr, 2004). This is a psychometrically sound 24 item self-completion measure of adjustment to distress and dysfunction in relation to self-consciousness of appearance. It has been validated on large scale clinical and general population samples. It has internal consistency of $\alpha = 0.92$, and correlates with measures of Fear of Negative Evaluation (Watson & Friend, 1969), $r = 0.50$, shame (Cook, 1994), $r = 0.66$, and negative and positive affect (Watson, Clark, & Tellegen, 1988) $r = 0.50$ and $r = -0.24$ respectively. The scale has test-retest reliability of 0.82 over 6 months. The DAS24 elicits identification of any bodily features of which the respondent is self-conscious, and asks them to think particularly about the main one. Typical items include *"I am self-conscious of my feature"* and *"Other people misjudge me because of my feature,"* rated never/almost never to always/almost always. The measure correlates with the DAS59 (Carr, Harris, & James, 2000), $r = 0.88$, and has been independently identified as a valid, reliable and recommended scale for use with this population (Ching, Thoma, McCabe, & Antony, 2003).

Perceived appearance severity

This was assessed using 1–7 Likert scale items. The first item indicated to what extent the particular body part of which participants were self-conscious was different to normal, and the second to what extent their overall appearance was different to normal. For objective severity, these judgments were made by plastic surgeons. For subjective severity, the judgements were made by participants themselves.

Table 1
Descriptive statistics for the DAS24 by aetiology

Aetiology	Participant sample							
	Outpatients[a]				Waiting-list patients[b]			
	n	*M*	*SD*	(%)	*n*	*M*	*SD*	(%)
Congenital	44	44.7	14.0	20.3	42	44.3	14.5	23.0
Dev. growth	51	51.6	19.4	23.5	41	51.0	17.7	22.4
Acquired	96	40.7	16.7	44.2	80	45.8	17.1	43.7
Other	26	47.1	18.5	12.0	20	38.3	15.3	10.9

Notes. 'Dev. growth': developmental growth. 'Acquired' includes disease and trauma. 'Other' includes all other causes.
[a] Objective severity sample.
[b] Subjective severity sample.

Participants

Four hundred plastic and reconstructive surgery patients were recruited in a national multi-centre study. The range of disfigurement aetiology included congenital malformation (e.g. cleft lip, haemangiomas), scarring from trauma and burns, disease (e.g. skin cancer, acne), and developmental growth (e.g. ears, nose). A breakdown of the sample by aetiology is provided in Table 1. A range of body sites was recorded (see Table 2). All participants were adults (18 years to 90, with a skew towards the age band of 20–40). Thirty two percent were men, and 68% women.

The ethnicity of participants was classified using the United Kingdom Commission for Racial Equality categories. Of those who provided information, 95% were white, 1.5% Pakistani, and under 0.5% each for Indian, Chinese, Black African, Black Caribbean, Black Other, Bangladeshi, and Others.

Procedure

Approximately half of the initial sample (217 participants) was recruited following routine plastic surgery outpatient clinic appointments. From these, plastic surgeons provided ratings of objective body site specific severity, and objective overall severity. The remainder (183) were an equivalent sample recruited through waiting lists. These participants provided their own subjective ratings of the severity of the main specific body site affected, and of overall appearance severity. The means and standard deviations of DAS24 scores of the two groups were highly similar (outpatients, $M = 44.8$, $SD = 17.5$; waiting list patients $M = 45.8$, $SD = 16.7$) and not significantly different ($t(398) = 0.56$, $p = 0.575$).

Results

The first analysis was the relationship of subjective severity with adjustment to disfigurement. As anticipated, and as indicated in the scatterplot (Fig. 1) there was a strong positive correlation between severity and DAS24 scores for both the severity of the specific body site ($r(183) = 0.42$, $p < 0.0005$) and overall appearance severity ($r(182) = 0.38$, $p < 0.0005$). This indicated that greater perceived severity was related to poorer adjustment.

Similar correlations between objective severity and adjustment demonstrated no linear relationship between adjustment and either objective severity of the specific body site ($r(217) = -0.001$, $p = 0.99$) or overall objective severity ($r(217) = 0.04$, $p = 0.61$).

Scatterplots of the data (Fig. 2) suggested that the relationship between objective severity and adjustment, if significant, was not linear. Quadratic terms were calculated (severity values squared) and included these in a multiple regression model along with a linear effect for severity. This enabled a direct test of the hypothesis that there was a more complex

Table 2
Mean scores of DAS 24 by location of affected body site

Body site	Normal visibility	Participant sample							
		Outpatients[a]				Waiting-list patients[b]			
		n	*M*	*SD*	(%)	*n*	*M*	*SD*	(%)
Head, face and neck	Visible	107	39.8	15.4	49.3	107	44.8	16.6	58.5
Torso and genitalia	Non-visible	69	53.3	16.6	31.8	41	51.7	16.6	22.4
Upper limb	Visible	24	42.7	19.3	11.1	15	42.1	14.9	8.2
Lower limb	Non-visible	17	45.2	19.6	7.8	20	41.7	17.3	10.9

[a] Objective severity sample.
[b] Subjective severity sample.

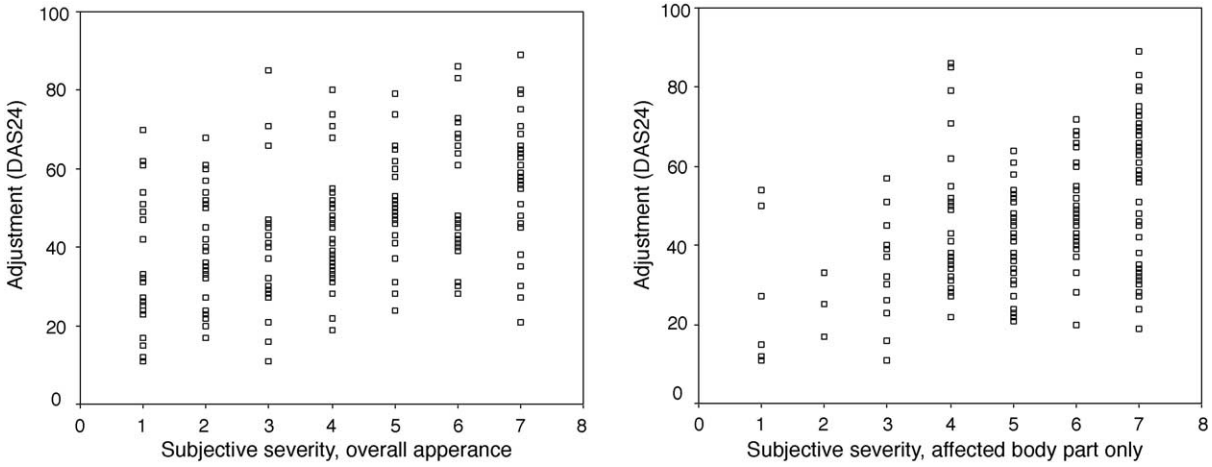

Fig. 1. Subjective ratings of severity.

relationship, whereby mid-range severity scores best predicted poor adjustment. Furthermore, the sample was further split according to the physical location of the main appearance concern, to reduce the chance of confounding severity with body site. This division was made on the basis of normally visible body areas (head, neck, face, and upper limbs) and normally non-visible body areas (torso, genitalia, and lower limbs).

Objective severity

Specific body site

Multiple regression analyses demonstrated significant relationships between objective severity of specific and visible body sites (adjusted $R^2 = 0.06$, $F(2,130) = 5.32$, $p = 0.006$), but not of specific non-visible body sites (adjusted $R^2 = 0.022$, $F(2,85) = 1.96$, $p = 0.15$). Both the non-linear (quadratic) component and the linear component contributed independently and significantly to the association between objective severity of specific body sites and adjustment (see Table 3).

Overall appearance

For objective severity of the overall appearance, there were significant relationships between adjustment and severity of visible differences (adjusted $R^2 = 0.03$, $F(2,130) = 3.1$, $p = 0.05$) and severity of

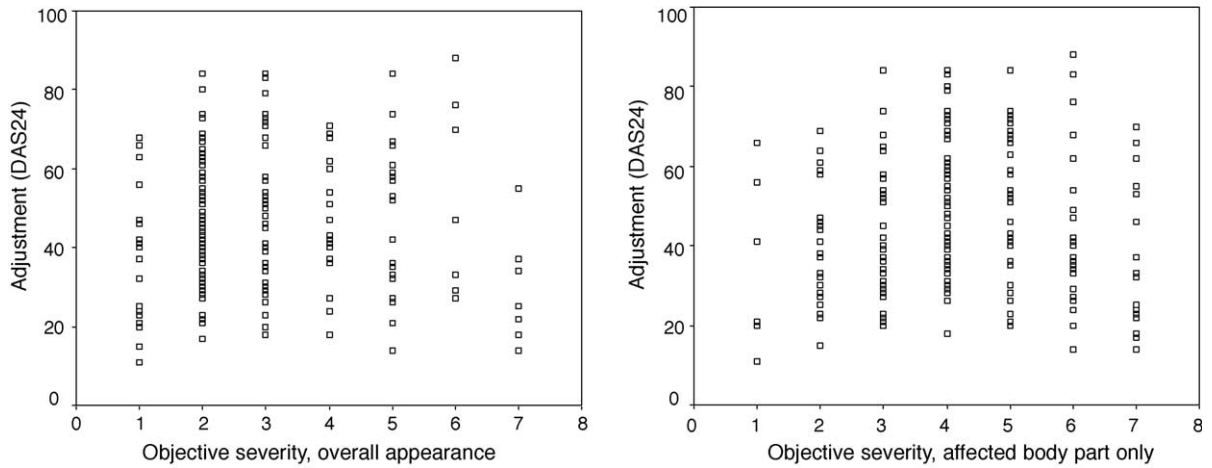

Fig. 2. Objective ratings of severity.

Table 3
Objective severity regression components

Severity term	Specific body site				Overall appearance			
	Visible		Non-visible		Visible		Non-visible	
	Beta	p	Beta	p	Beta	p	Beta	p
Linear	−1.43	0.001	0.57	0.273	0.62	0.10	0.94	0.04
Quadratic	1.42	0.002	−0.73	0.160	−0.76	0.04	−0.75	0.10

non-visible differences ($R^2 = 0.05$, $F(2,85) = 3.3$, $p = 0.04$). For visible differences, only the non-linear (quadratic) component independently contributed significantly. For non-visible differences only the linear component independently contributed significantly (see Table 3).

Subjective severity

Specific body site

For subjective severity of the specific body site for visible differences, the best models contained only the linear term. For visible differences, the addition of the quadratic term after the linear term actually suppressed adjusted R^2, which falls from 0.230 to 0.227. Consequently, the model containing only the linear term is reported. For this model, $R^2 = 0.23$, $F(1,121) = 37.2$. For non-visible differences, adjusted $R^2 = 0.07$, $F(1,60) = 5.4$ (see Table 4).

Overall appearance

Once again, the best model contained only the linear term. For subjective severity of the overall appearance for visible differences, the strong linear relationship is suppressed by addition of the quadratic term. For the model with the linear component alone, adjusted $R^2 = 0.14$, $F(1,120) = 20.5$ (see Table 4). When both terms are included, adjusted $R^2 = 0.14$, $F(2,120) = 10.9$, $p < 0.0005$; however, neither component contributed independently and significantly (for the linear component, $\beta = -0.077$, $p = 0.85$, and for the quadratic component, $\beta = 0.470$, $p = 0.26$).

For subjective severity of the overall appearance for non-visible differences, the same pattern can be observed as for visible differences. The strong linear relationship is suppressed by addition of the quadratic term. For the model with the linear component alone, adjusted $R^2 = 0.17$, $F(1,60) = 12.9$ (see Table 4). When both terms are included, adjusted $R^2 = 0.153$, $F(2,60) = 6.4$, $p = 0.003$; however, neither component contributed independently and significantly (for the linear component, $\beta = -0.603$, $p = 0.28$, and for the quadratic component, $\beta = -0.183$, $p = 0.74$).

Discussion

The purpose of this study was to investigate the impact of objective and subjective severity on psychological adjustment to appearance altering physical conditions. The regression models used to test these relationships have clear implications. For subjective severity of both specific body site and overall appearance, adjustment is predicted by a linear relationship. Greater subjectively perceived severity is related to poorer adjustment, particularly in visible differences. Subjective severity accounted for over 20% of the variance in adjustment. For objectively

Table 4
Subjective severity regression components

Severity term	Specific body site				Overall appearance			
	Visible[a]		Non-visible[a]		Visible[a]		Non-visible[a]	
	Beta	p	Beta	p	Beta	p	Beta	p
Linear	0.486	<0.0001	0.29	0.023	0.383	<0.0005	0.424	<0.001
Quadratic	_[b]	_[b]	_[b]	_[b]	_[b]	_[b]	_[b]	_[b]

[a] Quadratic term not entered into model.
[b] Best model does not include quadratic term.

assessed severity, the relationship is much smaller and more complex. Objective severity of visible specific body sites and visible overall appearance concerns accounts for approximately 7% of the variance in psychological adjustment. The relationships include significant quadratic components, with a negative beta value for the quadratic terms, thus indicating an inverted *U* shape relationship. Specifically, although the effect size was very small, extremes of severity (both the higher and lower scores) were associated with statistically significantly better adjustment than moderately severity. For objective severity of non-visible differences, only the linear relationship between overall appearance severity and adjustment was significant. However, this relationship was very weak and not manifest when the nonsignificant quadratic term was not also present in the model. There was no linear or quadratic relationship between non-visible, body site specific objective severity ratings and adjustment.

Essentially, the pattern is one of a linear relationship between adjustment and subjective assessment of severity for both visible and non-visible locations. For objective severity, the clearest findings are of an inverted *U* relationship between severity and adjustment only for visible differences, and no meaningful relationship between adjustment and severity ratings of appearance concerns not normally visible.

The observed relationship involving subjective severity is consistent with previous literature, which has suggested this relationship anecdotally (see Rumsey & Harcourt, 2004). It is possible to see two causal pathways relating the variables. On one hand, if an individual is poorly adjusted, they are increasingly likely to ascribe a more negative meaning to their appearance, rating it more severe. In this pathway, poor adjustment is seen as causing the perception of increased severity. Alternatively, if an individual perceives differences in their appearance as being more severe, they are likely to anticipate greater social difficulties and poorer reactions from others. This bleaker social world is then internalised and manifests as poorer overall adjustment. These pathways are not mutually exclusive, and it is probable that both operate simultaneously.

The outcome regarding objective severity of normally visible aspects of appearance is in many ways more interesting. Previous literature has claimed that there is no relationship between objective severity and adjustment. These findings contradict this. There are two reasons for the novelty of this finding. Firstly, the size of the data set enabled small effect sizes to be detected. Secondly, non-linear relationships were investigated. The meaning of the inverted *U* relationship is less clear than the linear relationship for subjective severity. Two possible explanations are consistent with the observations.

Firstly, the social implications of having a non-severe, moderately severe, or very severe difference of appearance can be considered. For the extreme ends of the spectrum, the social reactions of others will be relatively consistent. This makes the world more predictable and thus manageable for the person affected. At the non-severe end of the range, it is likely that social reactions will be trivial. At the other end, when reactions are characterised by the well known double takes and stares, there is an extent to which the individual can habituate or develop adaptive strategies to deal with this social threat. For moderate differences in appearance, social reactions are likely to be more ambiguous and show greater variation between individuals. This will make the development of a consistent adaptive strategy more difficult, and thus generate increased difficulty in adjusting. This process will clearly only be apparent when the appearance differences are normally visible, consistent with the findings presented here.

The second possible explanation which can be applied to the inverted *U* relationship suggests that participants across the varied levels of severity may not be equivalent. At the highest level of objective severity, it is more probable that there will be pain or functional compromises associated with the bodily difference. In this physical context, it is possible that any appearance concerns may be downplayed by some patients relative to those who have less significant accompanying physical problems. Furthermore, it is possible that some participants with low levels of objective severity may have co-morbid personality characteristics or associated psychopathology which has led them into seeking surgical intervention. While plausible, this explanation seems less likely as it does not account for the differences between normally visible and non-visible appearance concerns.

These findings are largely consistent with Cash's cognitive behavioural perspective on body image

(Cash, 2002; Cash, Melnyk, & Hrabosky, 2004), and it is useful to consider them in this context – particularly the relationship between body image and the actual physical characteristics of the body. Lerner and Jovanovic's (1990) goodness of fit model argues for a close relationship between self evaluation of attractiveness, and the extent to which one matches social standards of attractiveness, implying that objective (socially valued) attractiveness is related to subjective (self-evaluated) attractiveness. From the data presented here, it can be argued that self-rating in relation to appearance altering conditions does not follow this path, as the pattern for objective and subjective evaluations are not identical. The consequence of this is to recognise the possibility that although the social value of appearance may be internalised, specific feedback on objective characteristics of one's own appearance may not be assimilated so easily or accurately.

Consistent with Higgins' (1987) theorising on self-discrepancy in general adjustment (differentiation between actual, ideal and ought selves), Cash notes the importance of self-discrepancy between actual evaluation of physical characteristics and personal appearance ideals. It is suggested (e.g., Cash & Szymanski, 1995) that this discrepancy is responsible for the appearance evaluation aspect of body image. The relationship between subjective evaluation of severity and poor adjustment in this study suggests a greater discrepancy between actual appearance and ideal appearance in the poor adjusters. This discrepancy may of course be due to either a poorer evaluation of the actual self, more demanding ideals, or both (cf. Moss, 1997b).

These results have implications for intervention strategies. One of the demonstrable methods of helping people troubled by their appearance is social skills training (Robinson, Rumsey, & Partridge, 1996). Usually, this is based on the notion that social skills deficits elicit negative social feedback from others, which is then generates poor adjustment, and perpetuates poor social skills. The small amount of variance accounted for by objective severity is consistent with this model, in that it suggests that social feedback is elicited to a greater degree by a disfigured person's behaviour than the severity of the difference of their appearance. However, it does suggest that a focus on dealing with inconsistent social feedback could be beneficial. The finding of the expected relationship between subjective severity and adjustment is consistent with the model. However, if the social skills model was the most parsimonious explanation of adjustment, one would expect that the internalisation of negative feedback would result in a greater proportion of the variation in adjustment being explained by subjective severity.

The other principal psychological intervention for disfigurement is cognitive behavioural therapy (CBT). There is an assumption within a CBT framework that objective severity is not critical, unlike subjective severity. These findings largely support this view. Work which challenges the basis of subjective assessments of severity should in many cases improve adjustment, as part of a wider CBT approach.

A further implication of this work is the amount of variance in adjustment which is not accounted for by either objective or subjective severity. Objective severity in particular has such a weak relationship to adjustment, the essential point to take from the finding over and above the shape of the subtle non-linear relationship is the low level of practical significance of this association. The same argument can be made, though with less vigour, for subjective severity. Despite statistical significance of the finding, over 75% of variance in adjustment was unaccounted for by perceived severity. It is important to consider why variation in perceived severity does not account for a greater level of variability in adjustment. Over and above many of the familiar models of body image and adjustment (Cash & Pruzinsky, 2002), there are two possibilities that should be considered. The first is that it is not only the content of the appearance self-concept that determines adjustment, but also the organisation of appearance related information. Drawing from the social-cognitive conception of the self-schema as a dynamic, multi-faceted and hierarchical structure which guides information processing about the self, including appearance (Markus & Wurf, 1987), Moss and Carr (2004) have demonstrated that complexity, compartmentalisation, and relative importance of appearance information all relate to adjustment.

Secondly, no matter how mild or severe a perceived disfigurement is, to be different at all places one into a different and stigmatised social category. One of the

sources of poor adjustment is the impact of living (or at least, perceiving oneself to be living) in this 'different' social group, rather than belonging to a non-stigmatised group (cf. Baumeister & Leary, 1995).

This study has several limitations. Due to the sampling methods available, the measures of objective and subjective severity within this study were completed on two separate patient groups. Although the size and similarity of the two groups provides confidence in these findings, a replication in which objective and subjective severity were assessed in the same individuals would be valuable. Furthermore, the measure of severity was rather simple. Future work should elaborate and develop the measurement strategy, and also related the notion of severity to such constructs as concealability, and noticability. A replication would also benefit from an explicit sampling strategy to account for potential confounds between levels of severity and particular body sites affected, inherent in this relatively heterogeneous sample.

This paper has provided empirical evidence to clearly support the oft cited yet little evidenced claim that subjective severity of appearance problems is more related to poor adjustment than objective severity. Furthermore, evidence has been provided for a weak yet statistically significant inverted U shaped relationship between objective severity and adjustment. These findings are consistent with existing intervention strategies, but further demonstrate the need for continued work in understanding the variability in adjustment unexplained by the physical characteristics of disfigured people.

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