Monozygotic and Dizygotic Twins' Retrospective and Current Bereavement-related Behaviors: An Evolutionary Perspective

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The present study compared bereavement responses of 325 monozygotic (MZ) and 176 dizygotic (DZ) adolescent and adult twins following the loss of their co-twins. A subset of twins completed the Grief Experience Inventory using a retrospective time frame, while a second subset completed it using a current time frame. It was hypothesized that MZ twins (in both retrospective and current groups) would report higher levels of grief-related behavior than DZ twins, consistent with Hamilton's (1964) concept of inclusive fitness. Discriminant function and profile analyses yielded supportive findings, but only for the retrospective MZ and DZ twin comparisons. Females in both groups expressed higher levels of bereavement-related behavior than males. Findings are discussed with reference to theoretical aspects of grief and mourning.

Evolutionary psychologists focus on ultimate explanations of behavior (functional significance of behaviors with reference to survival and reproduction), compared with proximal explanations (immediate life history mechanisms associated with behavioral expression) (Mealey, 2000). The two are not incompatible, but represent different analytical levels. A small, but growing number of investigators have examined bereavement in light of evolutionary considerations (Archer, 1999; Littlefield & Rushton, 1986; Segal & Ream, 1998).

Evolutionary theory defines fitness as individuals' reproductive success. This definition was revised by Hamilton (1964) who viewed fitness as the sum total of genes transmitted through offspring, as well through the reproductive success of other biological relatives. This conceptualization has been termed *inclusive fitness*. Hamilton reasoned that individuals should be predisposed to act more altruistically toward close kin than distant kin or unrelated individuals as a way of preserving copies of their genes.

The concept of inclusive fitness becomes quite interesting in the case of MZ and DZ twins. From an MZ female twin's genetic vantage point, her co-twin's children are her genetic "children" (as well as her nieces and nephews), and she is their genetic "mother" (as well as their aunt). Parallel reasoning applies to MZ male twins and their relatives. It is further intriguing that MZ co-twins are more closely related biologically to one another (100%) than to their own offspring (50%). These relationships would not characterize DZ twins for whom the usual aunt/uncle–niece/nephew relationships remain intact. These situations generate a series of expectations regarding MZ and DZ twins' social relationships and reactions to the loss of those relationships. In general, it is anticipated that MZ twins should show more severe and persistent grief-related behaviors than DZ twins. However, a special mechanism for relating to one's twin is not proposed; rather, MZ and DZ twin relations are considered extensions of Hamilton's more general principle (see Segal, 1997).

Most experimental and clinical studies find that MZ twins enjoy closer social relations than DZ twins. Findings from diverse approaches (e.g., psychodynamic, behavioral-genetic) have been summarized in Segal (2000, and in press). A recent study found similar levels of intimacy between MZ and DZ twins, but greater likelihood of MZ twins naming each other as best friends (Foy et al., 2001). However, evolutionary approaches pay particular attention to *why* social relations may vary as a function of genetic relatedness. For example, MZ twins' social closeness (proximal function) may facilitate transmission of common genes (ultimate function), via mutual cooperation and care. Several twin studies of bereavement have proceeded with this view in mind producing confirmatory findings (see Segal, 2000; Segal & Blozis, this issue).

Considerable research also shows gender-related differences in reactions to loss (Segal, 1998; Segal & Blozis, this issue) and in the significance of kin relations (Salmon & Daly, 1996). Salmon and Daly (1996) found that Canadian females are better than males at naming relatives, and are more likely to refer to family roles (e.g., mother, cousin) than family names when discussing their relatives. This would support the view that females have been more reproductively successful by receiving assistance from, and investing in, close relatives. In contrast, males might be

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more reproductively successful via increased numbers of mates (Buss, 1999). However, this pattern has not been observed among all cultures, such as the Yanomamö, among whom males show superior knowledge of kin relations. Thus, the extent to which these results reflect selected responses to gender differences in processing information about close kin, or culture-specific social demands and circumstances, remains unclear (Buss, 1999).

The present study builds upon Segal and Blozis's report (this issue) that applied psychobiological and evolutionary perspectives in a twin analysis of coping and health characteristics. In that study, comparisons were made between MZ and DZ twins' retrospective and current bereavement-related behaviors. The Grief Experience Inventory (GEI), while completed by twins in the retrospective time frame, has never been completed by twins in its original current time frame. The present study revisited this inventory, comparing retrospective and current responses of bereaved MZ and DZ twins.

The Present Study

One group of MZ and DZ twins completed the GEI with reference to the first one to two months after the loss (retrospective). The second group completed the GEI with reference to current thoughts and feelings (current). Hypotheses are listed in Tables 1a and 1b.

Methods

Participants and Procedures

There was partial overlap between participants in the present study and those in previous reports from this project (Segal & Blozis, this issue; Segal & Bouchard, 1983; Segal & Ream, 1998; Segal et al., 1995). Most of the 509 surviving twins completed a comprehensive Twin Loss Survey (TLS) by mail, although several completed it in the investigator's laboratory. Additional details about this survey are provided in Segal et al. (1995), Segal and Ream (1998) and Segal and Blozis (this issue). Approximately half the participants had attended a twin loss support group.

Table 1a

Hypotheses Regarding Bereavement Differences in Surviving MZ and DZ Twins

1. $MZ_{retro} > MZ_{curr}$
2. $DZ_{retro} > DZ_{curr}$
3. $MZ_{retro} > DZ_{retro}$
4. $MZ_{curr} > DZ_{curr}$
5. MZr_{retro} vs. $MZ_{curr} < DZ_{retro}$ vs. DZ_{curr}

Table 1b

Hypotheses Regarding Bereavement Differences in Surviving Male and Female Twins

6. $Females_{retro} > Males_{retro}$
7. $Females_{cur} > Males_{curr}$

In most cases, zygosity was determined by twins' scores on the Nichols and Bilbro (1966) physical resemblance questionnaire. The final subject pool included 325 MZ twins and 176 DZ twins (76 same-sex and 100 opposite-sex). Zygosity was inconclusive for eight twins, prompting their exclusion from the study. Mean age at participation and age variance did not differ between MZ (46.55 years, *SD* = 16.09) and DZ twins (44.54 years, *SD* = 15.61), or between male (45.91 years, *SD* = 17.29) and female twins (45.81 years, *SD* = 15.39). Table 2 summarizes age and loss characteristics.

The GEI is included as part of the TLS. It was developed by Sanders et al. (1979, 1985), and was designed "to assess experiences, feelings, symptoms and behaviors of individuals during the grief process" (Sanders, 1979–80, p. 308). However, some items in the present study were rewritten to capture more immediate responses to this event, (i.e., bereavement experiences occurring one to two months following the loss). In addition, some questions were modified in both versions (with the permission of the author) to refer specifically to the deceased co-twin (see Segal et al., 1995).[1]

Reliabilities of the modified bereavement scales used in the present study were assessed by KR20. These values ranged from .71 to .89 for the retrospective group and from .25 to .90 for the current group. Items in the Guilt and Social isolation scales for the current subsample had little in common (reliabilities were .34 and .25, respectively). This does not necessarily reflect unreliability of these scales, given their acceptable reliability levels in the retrospective subsample and in other studies. Note that reliabilities of all other scales for the current group exceeded .70.

Table 2

Findings for Each Zygosity: Retrospective vs. Current Groups

	Statistics		
	Mean (years)	*SD*	Range (years)
MZ			
Retrospective ($n = 200$)			
Age at Participation	46.60	16.58	16–94
Age at Loss	39.80	16.84	15–87
Loss Interval	6.80	8.42[b]	0–44
Current ($n = 125$)			
Age at Participation	46.46	15.34	16–84
Age at Loss	40.14	15.90	15–80
Loss Interval	6.32	8.98	0–47
DZ			
Retrospective ($n = 97$)			
Age at Participation	44.32	15.04	18–83
Age at Loss	36.21	15.33	15–79
Loss Interval	8.11	10.98[a,b]	0–54
Current ($n = 79$)			
Age at Participation	44.81	16.38	18–78
Age at Loss	39.20	17.57	15–76
Loss Interval	5.61	7.17[a]	0–40

Note: [a]Levene's test, $F(1,175) = 2.35$, $p < .001$
[b]Levene's test, $F(1,295) = 1.70$, $p < .01$

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Results

Descriptive Comparisons of GEI Bereavement

Retrospective–Current Group Comparisons within Zygosity

As shown in Table 3, *t* tests were used to assess GEI scale score differences between MZ and DZ twins in the retrospective and current groups. A conservative .01 alpha level was chosen to help contain Type I error inflation rate. MZ_{retro} scores exceeded MZ_{curr} scores on Despair, Guilt, Social Isolation, Rumination, Depersonalization and Somatization. DZ_{retro} twins showed higher scores than DZ_{curr} on Despair and Social Isolation.

Zygosity Within Retrospective-Current Groups

MZ_{retro} scores (M = 11.68) exceeded DZ_{retro} scores (M = 10.46) on Guilt, $t(286) = 3.39$, $p < .01$, $d = .40$. MZ_{retro} twins' scores (M = 7.90) also exceeded DZ_{retro} twins' scores (M = 6.84) on Rumination, $t(272) = 2.80$, $p < .01$, $d = .34$. Analyses between MZ and DZ twins in the current group revealed no statistically significant differences on any of the eight GEI scales.

Gender Within Retrospective and Current Groups

In the retrospective group, females' scores exceeded males' scores on Despair, Anger/Hostility, Social Isolation, Loss of Control, Depersonalization and Somatization, as shown in Table 4. These differences were statistically significant. Females in the current group showed higher scores for Despair, Loss of Control, Rumination, Depersonalization and Somatization than did males, differences that reached statistical significance.

Discriminant Function Analysis of GEI Bereavement

Discriminant function analysis (Tabachnick & Fidell, 2001) was performed to determine if GEI subscales differentiated zygosity and gender of the study participants. Analyses were conducted separately for both retrospective and current groups. The same data analyses were also conducted using age- and sex-corrections according to methods described in McGue and Bouchard (1984), but are reported only if results differed from the uncorrected analyses.

Retrospective Group

Zygosity. Results showed that the GEI subscales could reliably discriminate between MZ and DZ twins, χ^2 (8, N = 211) = 23.72, $p < .01$, $d = .67$. Based on the within-group correlations between the discriminant function and GEI subscales, Guilt had the strongest relationship with the function ($r = .76$), followed by Rumination ($r = .41$). Five other predictors had correlations ranging from .17 to .37. One predictor, Loss of Control, showed a negative relationship with the function ($r = –.26$). Based on these results, Guilt and Rumination appeared to be driving the discrimination between zygosity groups, with MZ twins showing higher mean values than DZ twins. Classification results (using prior group membership probabilities) indicated that 66.4% of the cases were correctly classified using the GEI subscales. Age- and sex-corrected data showed

Table 3

Zygosity by Retrospective–Current Samples by Bereavement Scales: Means, Standard Deviations, *t* Statistics and Effect Size

	MZretro v. MZcurrent				DZretro v. DZcurrent			
GEI Bereavement	*Mean*	*SD(n)*	*t(df)*	*d*	*Mean*	*SD(n)*	*t(df)*	*d*
Despair								
Retrospective	11.68	4.69(174)	4.66(282)***	.56	10.46	5.13(82)	2.75(149)**	.45
Current	8.85	5.43(110)			8.14	5.18(69)		
Anger/Hostility								
Retrospective	5.49	2.71(189)	.02 (310)	.00	5.04	2.91(92)	–.83 (164)	.13
Current	5.48	2.77(123)			5.42	2.91(74)		
Guilt								
Retrospective	3.29	1.88(194)	4.76(313)***	.54	2.51	1.75(94)	.57 (167)	.09
Current	2.31	1.60(121)			2.36	1.64(75)		
Social Isolation								
Retrospective	4.31	2.07(193)[a]	3.31(314)**	.37	4.07	2.10(94)	3.21(170)**	.49
Current	3.58	1.67(123)[a]			3.12	1.77(78)		
Loss of Control								
Retrospective	6.04	2.22(180)	1.21 (296)	.14	6.17	2.46(89)	1.46 (161)	.23
Current	5.73	2.20(118)			5.61	2.40(74)		
Rumination								
Retrospective	7.90	2.91(185)	3.93(298)***	.46	6.84	2.98(89)	1.47 (161)	.23
Current	6.58	2.67(115)			6.15	3.03(74)		
Depersonalization								
Retrospective	6.22	1.97(191)	3.21(309)**	.37	5.66	2.34(94)	1.48 (168)	.23
Current	5.45	2.19(120)			5.13	2.27(76)		
Somatization								
Retrospective	8.71	4.76(172)	3.77(284)***	.45	8.10	4.44(80)	1.57 (150)	.26
Current	6.58	4.56(114)			6.97	4.39(72)		

Note: $^{**}p < .01$, $^{***}p < .001$, [a]Levene's test, $F(1,314) = 1.55$, $p < .01$

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Table 4

Gender Differences in Bereavement Scales Within Group

	Retrospective				Current			
BEI Bereavement	Mean	*SD(n)*	*t(df)*	*d*	Mean	*SD(n)*	*t(df)*	*d*
Despair								
Male	9.63	5.28(78)	–3.72(254)***	.47	6.59	5.33(46)	–3.01(177)**	.45
Female	12.02	4.48(178)			9.27	5.17(133)		
Anger/Hostility								
Male	4.54	3.01(83)	–3.17(279)**	.38	4.68	2.81(53)	–2.38(195)	.34
Female	5.68	2.61(198)			5.74	2.78(144)		
Guilt								
Male	2.76	2.00(85)	–1.61(286)	.19	2.11	1.61(53)	–1.16(194)	.17
Female	3.15	1.81(203)			2.41	1.61(143)		
Social Isolation								
Male	3.60	2.31(85)	–3.41(285)***	.40	3.06	1.66(54)	–1.72(199)	.24
Female	4.50	1.92(202)			3.52	1.72(147)		
Loss of Control								
Male	5.35	2.22(80)	–3.49(267)***	.43	4.92	2.06(52)	–2.87(190)**	.42
Female	6.40	2.26(189)			5.96	2.30(140)		
Rumination								
Male	7.40	3.21(83)	–.56(272)	.07	5.29	2.54(48)	–3.28(187)**	.48
Female	7.62	2.86(191)			6.79	2.81(141)		
Depersonalization								
Male	5.52	2.43(86)[a]	–2.72(283)**	.30	4.41	2.28(51)	–3.52(194)***	.51
Female	6.26	1.92(199)[a]			5.65	2.12(145)		
Somatization								
Male[a]	6.95	4.87(79)	–3.70(250)***	.47	5.20	3.91(50)	–2.88(184)**	.43
Female[a]	9.23	4.39(173)			7.29	4.57(136)		

Note $^{**}p < .01$, $^{***}p < .001$

[a]Levene's test, $F(1, 283) = 1.60$, $p < .01$

similar results, except that Guilt (r = .87) and Despair (r = .63) had the highest associations with the function.

Gender. GEI subscales reliably discriminated between males and females, χ^2 (8, N = 211) = 28.56, $p < .001$, d = .74. The within-group correlations between the discriminant function and the GEI subscales showed that the strongest relationship was with Loss of Control (r = .63), followed by Despair, Social Isolation and Somatization (r values ranged from .56 to .60). Correlations between the remaining variables and function ranged from .08 to .50. Classification results (using prior group membership probabilities) indicated that 64.5% of the cases were correctly classified. Similar age-corrected results were noted.

Current Group

Zygosity. No significant function at the .01 significance level was noted, χ^2 (8, N = 168) = 7.99, *ns*, suggesting that the GEI scales could not reliably discriminate between MZ and DZ twins in the current group. Similar age- and sex-corrected results were noted.

Gender. GEI subscales reliably discriminated between males and females, χ^2 (8, N = 168) = 20.24, $p < .01$, d = .69. Within-group correlations between the function and predictors showed that Rumination had the strongest relationship with the discriminant function (r = .86), followed by Depersonalization (r = .71) and Despair (r = .65). Correlations between the remaining seven predictors and function ranged from .24 to .55. Classification results (using prior probabilities) indicated that 66.7% of the cases were correctly classified. Similar age-corrected results were noted.

Profile Analysis of GEI Bereavement

Profile analysis (Stevens, 1996) was used to compare GEI bereavement scale scores for twins in the retrospective and current groups. Age- and sex-corrected analyses were also conducted and reported only if results differed from the uncorrected analyses.

Retrospective Group

Zygosity. Examination of Pillais' criterion showed that the profiles of the MZ_{retro} and DZ_{retro} twins across the eight GEI measures were not parallel, Pillais' = .11, $F(7, 203) = 3.49$, $p < .001$, d = .69. Again, univariate tests were evaluated at the .01 level to help contain Type I error inflation rate. The slopes from Loss of Control to Rumination were not equal between MZ and DZ twins, $F(1, 209) = 13.16$, $p < .01$, d = .50, with MZ twins showing a greater positive slope than DZ twins. Flatness and levels tests are not performed when profiles are nonparallel (Stevens, 1996). Similar age- and sex-corrected results were noted.

Gender. Pillais' criterion indicated that the profiles of $male_{retro}$ and $female_{retro}$ twins were not parallel, Pillais' = .11, $F(7, 203) = 3.68$, $p < .01$, d = .71. The slopes were not equal between Despair and Anger/Hostility, $F(1, 209) = 8.34$, $p < .01$, d = .40, with females showing a greater negative slope than males. Age-corrected results also indicated nonparallel profiles, but significant slope differences

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were noted between Loss of Control and Rumination, $F(1,209) = 7.84$, $p < .01$, $d = .39$, with males showing a greater positive slope than females.

Current Group

Zygosity. Examination of Pillais' criterion showed that the GEI profiles of the MZ_{curr} and DZ_{curr} twins were parallel, Pillais' = .05, $F(7, 160) = 1.32$, *ns*. Assessment for profile flatness indicated that the profiles were not flat, Pillais' = .80, $F(7, 160) = 88.88$, $p < .001$, $d = 3.94$. However, age- and sex-corrected analyses showed parallel, Pillais' = .06, $F(7,160) = 1.47$, *ns*, and flat profiles, Pillais' = .01, $F(7, 160) = .28$, *ns* (see Figure 1). The test of levels (uncorrected or corrected) showed no difference between zygosity.

Gender. Pillais' criterion showed that the profiles of the $male_{curr}$ and $female_{curr}$ twins were not parallel, Pillais' = .11, $F(7, 160) = 2.74$, $p < .01$, $d = .69$. However, age-corrected analyses indicated that the profiles were parallel, Pillais' = .06, $F(7, 160) = 1.57$, *ns*, and flat, Pillais' = .02, $F(7, 160)$

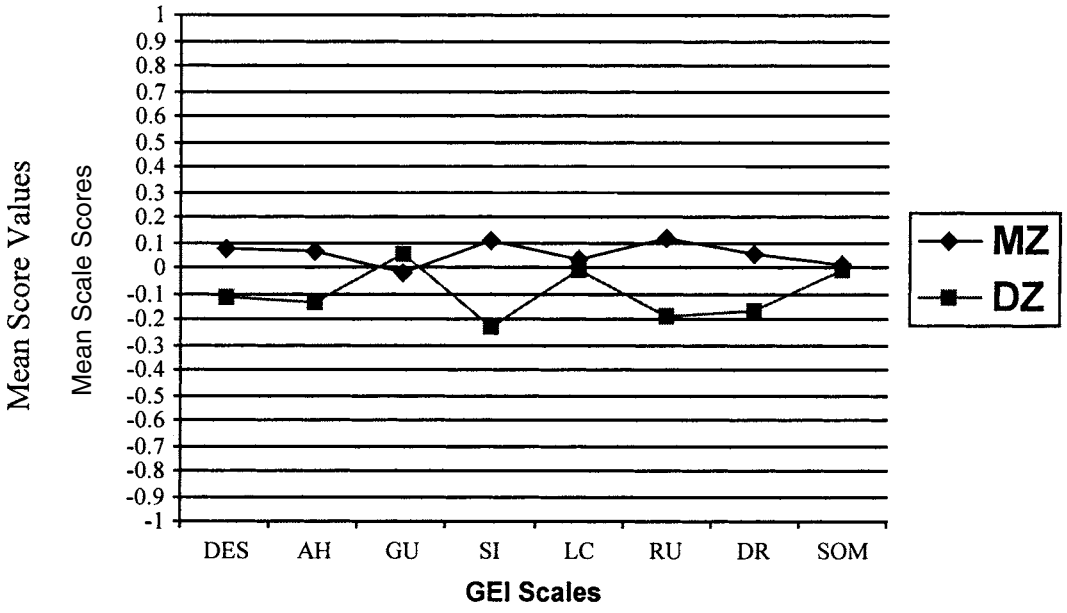

Figure 1

Current Profile Analysis (age-and sex-corrected).

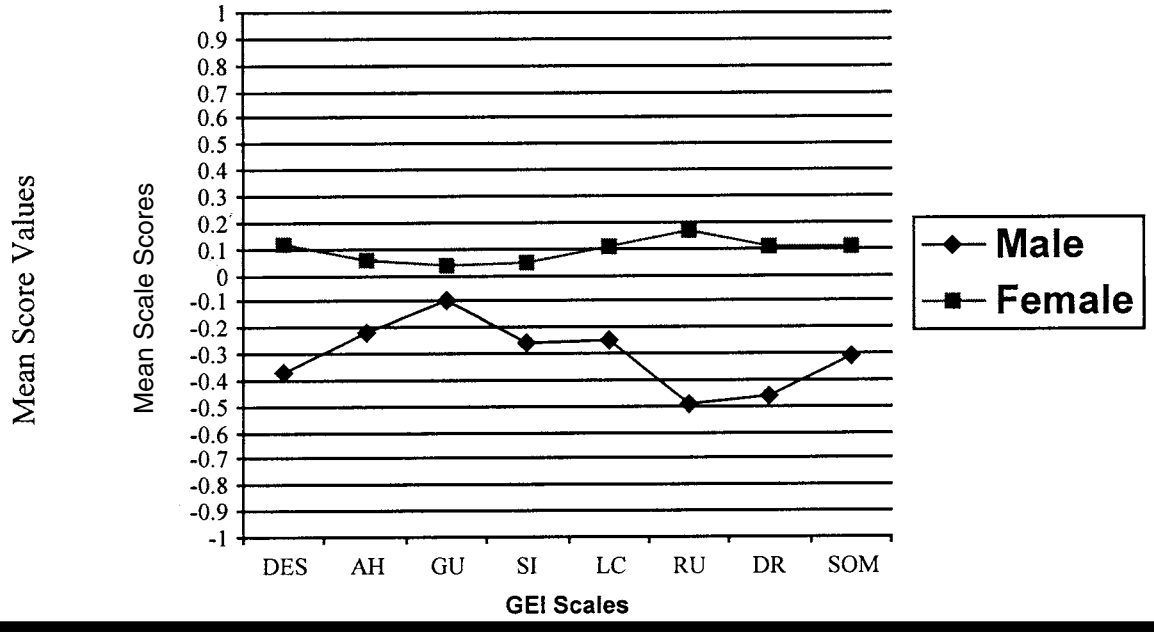

Figure 1

Current Profile Analysis (age-and sex-corrected).

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= .48, *ns* (see Figure 2). The age-corrected test of levels showed a significant difference, $F(1, 166) = 10.61$, $p < .01$, $d = .51$, with females consistently obtaining higher mean scores than males across the measures.

Discussion

GEI Bereavement Scales

Retrospective-Current Group Comparisons Within Zygosity (Hypotheses 1, 2 and 5)

MZ_{retro} twins scored significantly higher than MZ_{curr} twins on six of the eight bereavement scales. These differences may reflect some decrease in bereavement–related behaviors over time as twins learn to adjust and cope. Like their MZ counterparts, DZ_{retro} twins' scores generally exceeded DZ_{curr} twins' scores, although differences reached statistical significance on only two scales. The small differences on most scales may reflect small effects requiring larger samples size to detect statistically.

This set of results was, however, somewhat surprising, given Segal and Ream's (1998) finding that MZ twins showed *less* change in grief intensity over time than DZ twins, a difference that was statistically significant. (A similar observation was noted by Segal and Blozis; this issue). Segal and Ream (1998) suggested that this reflected the severe and enduring grief typical of MZ twin survivors. The use of different samples and measures may be partly responsible for the variation observed across studies. Another important difference was that Segal and Ream assessed past and current grief using the *same* twin individuals, while the present study assessed retrospective and current bereavement using *different* twin individuals. In addition, the GEI scales may tap different facets of bereavement than the single-item grief measure.

Zygosity Within Retrospective–Current Groups (Hypotheses 3 and 4)

MZ_{retro} twins obtained higher scores than DZ_{retro} twins on all bereavement scales, with differences reaching statistical significance on two scales (Guilt and Rumination). These findings are consistent with both psychosocial and evolutionary predictions. The Guilt scale taps feelings of responsibility for the death, as well as unease at having survived. The Rumination scale assesses extent of preoccupation with the deceased. Given the close social relationships characteristic of most MZ pairs, it does not seem surprising that these two scales should most sharply distinguish MZ_{retro} and DZ_{retro} twins. In contrast, MZ_{curr} and DZ_{curr} twins did *not* differ significantly on any of the scales. Again, this result was unexpected, given Segal and Ream's (1998) finding that MZ twins' grief remains high over time.

Gender Groups Within Retrospective–Current Groups (Hypotheses 6 and 7)

Females in both the retrospective and current groups had consistently higher bereavement scale scores than males, with most differences reaching statistical significance. These findings are consistent with previous bereavement research, and with evolutionary treatments of gender differences in the significance of family relations.

Discriminant Function Analysis

In the retrospective group, discriminant function analysis correctly classified 66.4% of twins based on zygosity and 64.5% based on gender. Effect sizes were medium and high, respectively. Two scales (Guilt and Rumination) showed moderate to strong relationships with the discriminant function associated with zygosity. Three scales (Loss of Control, Despair and Social Isolation) showed strong relationships with the discriminant function associated with gender. That this trio of scales emerged is not surprising, given findings of greater expressivity among bereaved females than males. Despair measures the most pervasive psychological expression of grief; Loss of Control reflects inability to control overt emotional experiences; Social Isolation captures feelings of being isolated by others, as well as oversensitivity to being hurt in social relationships (Sanders et al., 1979). Data corrected for sex and/or age yielded similar findings, except that in analyses involving zygosity Despair showed a higher association with the function. A useful approach to individual differences in bereavement might target these specific behaviors.

In the current group, discriminant functions could not identify individuals based on zygosity. Inability to control for retrospective ratings, due to independence of the retrospective and current groups, urges cautious interpretation of these findings. In contrast, the current gender analysis obtained the best classification results (66.7%) of those undertaken in the present study. A medium effect size was associated with this finding. This further underlines the importance of considering gender differences in bereavement response, both in theoretical and applied contexts. We note that Despair showed a strong association with the function in both the current and retrospective gender groups, information that should be of interest to bereavement counselors. Age- and sex-corrected data analyses yielded similar findings.

Profile Analysis

In the retrospective group, profiles were not parallel, with the difference between the Loss of Control and Rumination scales being greater for MZ than DZ twins. This configural difference in MZ_{retro} and DZ_{retro} twins' scale score profiles confirms the presence of meaningful bereavement differences between twin types. In addition, the profiles of males and females in the retrospective group were not parallel. Profile differences were most apparent in the segment from Despair to Anger/Hostility. When the data were age-corrected, statistically significant slope differences emerged between Loss of Control and Rumination. These findings are compatible with the other gender-related differences reported in the present study and in previous studies.

The profiles of MZ_{curr} and DZ_{curr} twins were parallel, but not flat. They were, however, both parallel and flat in the age- and sex-corrected analysis. As suggested above, the near equality in level and patterning of current twins' scores (in contrast with previous findings) suggests that the GEI's multiple scales function differently than a single grief intensity rating, especially when used with independent groups.

Profiles were not parallel for males and females in the current group. However, profiles were parallel when the

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data were corrected for age effects. Even though time had passed since the death of the co-twin, females maintained higher scores than males across measures. This may partly reflect females' greater interest in family relations alluded to earlier, but could also be associated with the greater social acceptability of female than male emotional expressivity when facing stressful events (Lonneto & Templer, 1986).

Theoretical Implications of the Current Study

Examining grief and bereavement from an evolutionary perspective is relatively novel. Some findings, but not all, supported an evolutionary perspective on bereavement-related behaviors. In support was the finding that MZ_{retro} twins obtained consistently higher mean scores on the GEI scales (two significantly higher) than DZ_{retro} twins. This pattern was not repeated for twins in the current group. Given that the two groups were independent, it would be of interest to obtain comparable GEI data from the same individuals in future studies. Observed gender differences were consistent with an evolutionary perspective.

Some scientists challenge the view that the nature and severity of bereavement may be related to the degree of genetic relatedness between survivor and deceased. However, findings from this study (at least for the retrospective group) were consistent with an evolutionary view. It is important to note that evolutionary psychology is not incompatible with more proximal explanations of grief that rest on concepts such as differing levels of social closeness and contact. These proximal behaviors may be linked, in an immediate sense, with the ultimate function of enhancing future genetic representation. The specific mechanisms underlying bereavement-related behaviors warrant further investigation, but there are likely candidates. A recent study demonstrated that emotional closeness partially mediates the effect of genetic relatedness on willingness to behave altruistically (Korchmoros & Kenny, 2001). Segal and Blozis (this issue) found that social closeness mediated the relationship between zygosity and grief for twins in the retrospective group. Further studies along these lines would be welcome.

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Footnote

1 In the retrospective version, some items in the Death Anxiety scale were omitted by a previous investigator due to their potentially upsetting content; these scales were not included in the present study. One of the twelve items was inadvertently omitted from the Rumination [retrospective] scale, so adjustment was made according to the following formula: RU (score) = RU11 + RU/11.)

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