Mark S MacLean* (macleanm@seattleu.edu), Seattle University, 901 Twelfth Avenue, P.O.
Box 222000, Seattle, WA 98122-1090, and Paul M Terwilliger. The subconstituent algebra of a
bipartite distance-regular graph; thin modules with endpoint two. Preliminary report.

We consider a bipartite distance-regular graph $\Gamma$ with diameter $D \geq 4$, valency $k \geq 3$, intersection numbers $b_i, c_i$ and
eigenvalues $\theta_0 > \theta_1 > \cdots > \theta_D$. Let $A_i$ denote the $i^{th}$ distance matrix of $\Gamma$. Fixing a vertex $x$, let $E_i^x$ denote the
projection onto the $i^{th}$ subconstituent of $\Gamma$, and let $T$ denote the Terwilliger algebra of $\Gamma$ with respect to $x$. Let $W$ denote a thin irreducible $T$-module with endpoint 2. Observe $E_2^x W$ is a 1-dimensional eigenspace for $E_2^x A_2^x E_2^x$; let $\eta$ denote the corresponding eigenvalue. Let $d = \lfloor D/2 \rfloor$. It is known $\tilde{\theta}_1 \leq \eta \leq \tilde{\theta}_d$ where $\tilde{\theta}_1 = -1 - b_2 b_3 (\theta_1^2 - b_2)^{-1}$, $\tilde{\theta}_d = -1 - b_2 b_3 (\theta_d^2 - b_2)^{-1}$. For $\tilde{\theta}_1 < \eta < \tilde{\theta}_d$ we obtain the following results. We show the dimension of $W$ is $D - 1$. We find
two bases for $W$. We show each basis is orthogonal (with respect to the Hermitean dot product) and we compute the
square norm of each basis vector. We find the matrix representing the adjacency matrix with respect to each basis. We
find the transition matrix relating our two bases for $W$. (Received August 22, 2005)