

## Errata for “Iwahori–Hecke algebras and Schur algebras of the symmetric group”

### CHAPTER 1

Page 9, Corollary 1.17:  $\mathcal{K}$  should be the algebraic closure of  $\mathbb{C}(\hat{q})$

### CHAPTER 2

Page 17, line -2: Replace “...and one can check that  $C^{\nu} \cong \text{Hom}_R(C^\lambda, R)$ ” with “and  $\text{Hom}_R(C^{*\lambda}, R)$  is a right  $A$ -module with  $A$ -action given by  $(f \cdot a)(x) = f(ax)$ , for  $f \in \text{Hom}_R(C^{*\lambda}, R)$ ,  $a \in A$  and  $x \in C^{*\lambda}$ ).

Page 21, proof of 2.18: Delete “that  $C^\nu \cong \text{Hom}_R(C^{*\nu}, R)$  as right  $A$ -modules. Therefore” and after the displayed equation add “Hence,  $\dim P^\lambda \otimes_A C^{*\nu} = [\text{Hom}_R(C^{*\nu}, R) : D^\lambda] = d_{\nu\lambda}$  since  $\text{Hom}_R(D^{*\mu}, R) \cong D^\mu$  whenever  $D^\mu \neq 0$ .”

Page 24, exercise 7(i). Delete “In addition, show that  $C^\lambda \cong \text{Hom}_R(C^{*\lambda}, R)$  for all  $\lambda \in \Lambda$ .”

Page 25, line 3: change parathetical remark to (the four Kazhdan–Lusztig bases  $\{C_x\}$ ,  $\{C'_x\}$ ,  $\{D_x\}$  and  $\{D'_x\}$  of  $\mathcal{H}(\mathfrak{S}_n)$  are all cellular; however, this is not true for Hecke algebras of other types).

### CHAPTER 3

Page 38, Warning:  $S^\lambda$  is the dual of the Dipper–James Specht module indexed by  $\lambda$ ; that is,  $S^\lambda \cong (S_{DJ}^\lambda)^\diamond$ . One can check that  $(S_{DJ}^\lambda)^\diamond \cong S^{\lambda'}$  so it is necessary to replace  $\lambda$  with  $\lambda'$  when comparing our results with those of Dipper and James.

Page 44, line 2: The statement of Theorem 3.36(ii) should read:

Let  $\mathfrak{s}$  be a standard  $\lambda$ -tableau,  $\mathfrak{t} = \mathfrak{s}(i, i+1)$  and  $\rho = \text{res}_{\mathfrak{s}}(i) - \text{res}_{\mathfrak{t}}(i)$ . Then

$$f_{\mathfrak{s}} T_i = \begin{cases} qf_{\mathfrak{s}}, & \text{if } i \text{ and } i+1 \text{ are in the same row of } \mathfrak{s}, \\ -f_{\mathfrak{s}}, & \text{if } i \text{ and } i+1 \text{ are in the same column of } \mathfrak{s}, \\ -\frac{1}{[\rho]_q} f_{\mathfrak{s}} + f_{\mathfrak{t}}, & \text{if } \mathfrak{t} \in \text{Std}(\lambda) \text{ and } \mathfrak{s} \triangleright \mathfrak{t}, \\ -\frac{1}{[\rho]_q} f_{\mathfrak{s}} + \frac{q[\rho+1]_q [\rho-1]_q}{[\rho]_q^2} f_{\mathfrak{t}}, & \text{if } \mathfrak{t} \in \text{Std}(\lambda) \text{ and } \mathfrak{t} \triangleright \mathfrak{s}. \end{cases}$$

[That is, in the book there is a factor of  $q$  missing from the the coefficient of  $f_{\mathfrak{t}}$  in the last line.]

Page 44, line -6: missing bracket

Page 46, line 11: Replace  $l_e^\lambda$  with  $l_e$  throughout.

Page 47, line 4:  $\bar{\lambda}^i$  is a *composition* of  $\lambda_i$ .

Page 47, line 5:  $g_i$  is the greatest common divisor of  $\{[\gamma]_q^! \in \mathcal{Z} \mid \gamma \triangleright \bar{\lambda}^i\}$ . That is, we must define  $g_i$  to be an element of the ring  $\mathcal{Z} = \mathbb{Z}[q, q^{-1}]$ .

Page 47, Lemma 3.42: Suppose that  $R = \mathcal{Z}$ , that  $\lambda = (\lambda_1, \dots, \lambda_k)$  is a partition of  $n, \dots$

Page 47, line -7: On the other hand, if  $\lambda \triangleright \nu$  then  $(\lambda_1, \lambda_2, \dots, \lambda_k) \triangleright (\lambda_1, \lambda_1 - \mu_1, \dots, \lambda_k - \mu_k); \dots$

Page 53, line -7:  $h_i = h_{i1}^\lambda$ .

### CHAPTER 4

Page 58, line 4:  $\text{last}(T) = \begin{array}{|c|c|c|} \hline 1 & 2 & 6 & 8 \\ \hline 3 & 4 & 5 & 7 \\ \hline \end{array}$ .

## CHAPTER 5

Page 70, line 5: if and only if  $d(\text{first}(\mathbf{S})) \geq d(\text{first}(\mathbf{T}))$ .

Page 72, line 2: then  $a < c$

Page 72, before Lemma 5.12: Insert the lines “Define maps  $\varphi_{\mathbf{T}^\mu \mathbf{T}^\omega} : M^\mu \longrightarrow M^\omega$  and  $\varphi_{\mathbf{T}^\omega \mathbf{T}^\mu} : M^\omega \longrightarrow M^\mu$  by  $\varphi_{\mathbf{T}^\mu \mathbf{T}^\omega}(m_\mu h) = m_\mu h$  and  $\varphi(h) = m_\mu h$  for all  $h \in \mathcal{H}$ . Note that  $M^\omega = \mathcal{H}$ . Both  $\varphi_{\mathbf{T}^\mu \mathbf{T}^\omega}$  and  $\varphi_{\mathbf{T}^\omega \mathbf{T}^\mu}$  are elements of the Schur algebra.

Page 73, line 18: Note that if  $x = (i, j)$  and  $y = (k, l)$  then  $j - i + k - l + 1$ .

Page 74, line 5: For  $\mathfrak{S}_n$  read  $\mathfrak{S}_\mu$ .

Page 75, line 1: Suppose that  $\mathfrak{t} = \text{first}(\mathbf{T})$ . Then  $\pi_{\mathfrak{t}}^\mu \varphi_{\mathbf{T}} = \varphi_{\mathfrak{t}} \varphi_{\mathbf{T}^\omega \mathbf{T}^\mu} \dots$

Page 78, line -2:  $B_4$  should be  $G_4$ .

Page 78, line -2: ... columns  $c_1 < c_2 < \dots < c_z$

Page 81, line 15:  $M_{\mathbb{F}}(k) = M(k) \otimes_R \mathbb{F}$  should be  $M_{\mathbb{F}}(k) = (M(k) + \mathfrak{p}M(k))/\mathfrak{p}M(k)$ .

Page 85, line 10: *is* well-defined

Page 86, Proof of Theorem 6.37: The last paragraph of the proof contains a gap. The proof breaks down in the case where  $W^\lambda$  is irreducible. The argument can be salvaged using Theorem 5.45 (which describes the partitions which index the irreducible Weyl modules). See Lyle–Mathas (math.RT/0607451) for details.

## CHAPTER 6

Page 98, Prop. 6.1: Replace “ $\nu_i \triangleright \nu_j$ ” with  $\nu_j \triangleright \nu_i$ .

Page 105, line -5: “good” should be “removable”.

Page 119, line 20: delete not.

Page 135, Note added in proof: Grojnowski and Vazirani [C,E] prove Conjecture 6.54 only up to a permutation of the multipartitions which index the simple modules of the Ariki–Koike algebras. Ariki (math.RT/0511552) has now proved that this permutation is trivial, thus establishing Conjecture 6.54.

Grojnowski’s [B] proof of the classification of the blocks of the Ariki–Koike algebras (conjecture 6.53) was incomplete. The conjecture has now been proved by Lyle and Mathas (math.RT/0607451).

Page 135: line 11: A should be B.

Page 135: line -11: E should be D.

## APPENDIX A

Page 142, line -11:  $\pi^G : M \longrightarrow N$ .

Page 142, line 2: The ideals  $\text{Rad } P_i \oplus \bigoplus_{j \neq i} P_j$  are only some of the maximal ideals of  $A$ . The argument should be replaced with the following.

Write  $A = P_1 \oplus \dots \oplus P_k$  as a direct sum of principal indecomposables. Then the modules  $\text{Rad } P_i \oplus \bigoplus_{j \neq i} P_j$ , for  $i = 1, 2, \dots, k$ , are maximal ideals of  $A$ . The intersection of these ideals is  $\text{Rad } P_1 \oplus \dots \oplus \text{Rad } P_k = \text{Rad } A$ ; hence, the Jacobson radical of  $A$  is contained in  $\text{Rad } A$ .

Conversely, suppose that  $M$  is a maximal ideal of  $A$ . Then  $A/M$  is simple so  $(\text{Rad } A)(A/M)$  is either 0 or  $A/M$ . However,  $\text{Rad } A$  is nilpotent so  $(\text{Rad } A)^n = 0$  for some  $n$ ; therefore,  $(\text{Rad } A)(A/M) = 0$  since otherwise  $A/M = 0$ . In particular, this shows that  $\text{Rad } A \subseteq (\text{Rad } A)A \subseteq M$ . Therefore,  $\text{Rad } A$  is contained in every maximal ideal of  $A$ ; consequently,  $\text{Rad } A$  is contained in the Jacobson radical of  $A$ . This completes the proof.