Index

absorption 31
academic excellence, as gendered 198–9
academic STEM 146–7
institutional transformation
gender equity practices 154–7
and NSF Advance program 152–4
outcomes 157–61
study discussion 161–2
workforce participation, equity and inclusion of women
inhospitable climate and culture 148–52
low participation of women faculty 147–8
access
to equipment 151, 232, 233
to knowledge 6–7
to research assistance and funding 149
to role models and mentors 149
accumulative disadvantage 151–2
Acker, J. 6, 131, 150, 187, 194, 231–2
ADVANCE program 10, 146
funding of project 169
initiatives 154–7
and institutional transformation 152–4
IT (Institutional Transformation) awards 156, 158–9
outcomes 157–61
successes 161–2
advancement opportunities facilitated by others 114–15
facilitated by self 115–16
impact of social capital 119–20
impediments 120
initiatives 155–7
instrumental personality profile 118, 120
to managerial and leadership roles 104–5
as measure for career persistence 47, 50, 51, 53
outspokenness 119
relational practice 120
role of visibility 113
as under-researched area 102, 103–4
Akrivou, K. 28–9, 30
American Chemical Society 170, 176–7
American Geophysical Union 170, 177
American Mathematical Society (AMS) 170, 177–8
American Statistical Association (ASA) 170, 178–9
Anderson, M.S. 206, 219, 221
APESMA (Association of Professional Engineers Scientists and Managers Australia) 82–3, 84, 85, 87, 103, 236
attrition high rate, post-graduation 101, 103
inherent systemic factors contributing to 166
sexist attitudes as contribution to 96
work–family issues as contribution to 79, 90–91
ATU (Australian technical university) study 80
retention 81
see also family considerations
Australian Bureau of Statistics 68, 84
Australian studies see career anchors study; family considerations; women managers and leaders
AWARDS (Advancing Ways of Awarding Recognition in Disciplinary Societies) project 11 at AWIS 168–71
best practices
developing a diverse pool of nominations 173–4
eliminating bias 171–2
objective evaluation of nominees 174–6
reviewing and updating portfolio 172–3
expansion 181
forward thinking 182
outcomes by society 176–80
AWIS (Association for Women in Science) 11, 166, 167, 168–71, 176, 181
Ayre, M. 73, 79, 81, 84, 103, 150
Bagilhole, B. 17, 18, 82, 84, 86, 88, 193, 197, 200, 206, 226, 237
Bailie, C.A. 229, 230
Bailyn, L. 6, 150, 204
Bakker, A.B. 31, 32
Bandura, A. 29, 32, 40–41, 43
Barnard, S. 206, 226
barriers to STEM careers 6–7, 17, 45, 50–51, 53, 104, 228, 236
Bedeian, A.G. 41, 45
Bell, S. 4, 5
Benschop, Y. 6, 129, 150, 187, 194, 195, 196, 197, 198
bias
concept of implicit 171–2
gender
in promotion processes 105
in science, study 17
second generation 33–4
recognising unconscious 155, 239, 240
bifocal approach 130, 141
Bilimoria, D. 5, 6, 7, 16, 18, 33, 35, 51, 57, 146, 151, 154, 157, 158, 160, 161, 187
Blackwell, L. 79, 83, 84, 86, 91
Bleijenbergh, I.L. 204, 206, 207
Blickenstaff, J.C. 5, 7, 166, 187
Bolino, M.C. 59, 62, 63
Bonner, D. 60, 61
Boyatzis, R.E. 28–9, 30, 35
Bradley, A. 228, 242
Braxton, J. 206, 219
Brescroll, V.L. 17, 220
Brouns, M. 6, 150
Brown, S.D. 41, 43, 50
Burke, R.J. 5, 6, 187
burnout 31
Buse, K. 16, 35, 51–2, 73, 91, 93, 96–7, 103
Cabrera, E.F. 57, 102
Callister, R.R. 151, 155
care see combining care and career
career anchors study 9, 57–60
insights from women in mining industry
career building 66–7
career challenge 65
deciding to stay or go 66–70
extrinsic aspects 68–9
interview data 63–6
intrinsic aspects 67–8
lifestyle 63–5
multiple career anchors 65–6
people and work environment 69–70
questionnaire analysis 61–3
structural factors 70
methodology
data analysis 61
data collection 60–61
study conclusions 75
study discussion
career anchors 70–72
deciding to stay or go 72–3
implications 74–5
methodological considerations 73–4
career attitudes see career anchors study
career building 66–7
career intentions see career anchors study
career persistence study 1 8–9, 16
findings
Index

challenge and novelty 26–7
feeling worthwhile, valuable and fulfilled 27–8
identity 23–4
meaning and purpose 25–6
positive outlook 25
self-efficacy 24–5
hypothesized model of 29
methodological approach 19, 23
study conclusion 34–5
study discussion
engagement 30–32
future research 34
ideal self 28–30
implications for practice 32–4
limitations 32
summary of respondents 20–22
women and engineering careers 17–18
career persistence study 29
measures 42–3
career attitudes 45
self-efficacy and outcomes expectations 43–4
turnover intentions 48
workplace supports and barriers 45–7
persisters and non-persisters
demographic and background profiles 48–9
differences between 49–51
by gender 39–40
sample and participant profile 42
study discussion 51–4
theoretical background and framework 40–41
career satisfaction 41, 45, 51, 53–4, 73, 167
Carli, L.L. 6, 102, 104
Carson, K.D. 41, 45
Carter, N. 7, 120
Cech, E. 18, 33, 52, 91
centre construction 130, 133
challenge
as career anchor 62–5, 67, 71–2, 73
as factor in career persistence 26–7, 29–30, 35
pure 64, 65, 72
Chang, C.L.H. 71, 72, 74
change
discontinuous nature of 30
as incremental 141
managing 108
organizational 114, 139, 141, 156, 162
of role 65, 66, 67, 68, 69, 70
see also women as power resources
chemistry, academic 148, 168, 176–7
childcare
as factor in attrition 79, 90
provision for 85–6, 221
responsibilities 52, 79, 82, 83–4
shared 94–5, 96
co-workers, perceived support from 46, 50
Cockburn, C. 128, 131, 133, 187
collective action 131, 132, 142
combining care and career 204–7
care, as a conversation topic 11, 209, 210, 211, 213, 214, 218, 220–221
care responsibilities 86, 204, 205, 217, 219–20
methodology
analysis framework 208–9
procedure 207–8
results
creating new norms 216–18
navigating norms 214–16
negotiating norms 211–14
nominating norms 209–11
study discussion 218–20
practical implications 220–221
strengths and limitations 221–2
commitment to career 25, 41, 45, 51, 53–4
committee objective practices 174–6
company values 69–70
complexity theory 30
compressed work weeks 221
conflicts of interest
and committees 175
policies 177
construction industry 49, 82–3, 89, 93, 112, 127
Women in STEM careers

collection of women 128, 130, 131, 132, 133
collectional barriers 50–51
collectional supports 50
Corbin, J. 32, 208
Cortina, L.M. 45, 46, 50, 53
CoSTEM 39, 40
credibility 102, 112–13
CREW (Careers Review of Engineering Women) 9, 79–80, 83–7, 92, 93
critical acts 142
Crosby, F.J. 187, 196
Curtis, J.W. 147, 149
de Vries, J. 130, 141
De Welde, K. 6–7
Dean, D.J. 6, 150
dedication 31, 62, 63, 64, 150
deficit model, revealing limitations of
Department of Labor 16, 146
detrimental belief structures 150
developmental experiences 47
difference argument 192–3
discrimination
areas of 151
manifestation of 17
prevalence of 103, 236
recognition of 239, 240
teaching scenarios for 241
Du, X.-Y. 233, 234
dual career couples 221
Duffy, M.K. 45–6, 53
Dutch context 189
Eagly, A.H. 6, 57, 102, 104, 105
education
impacts of gendered culture in engineering 233–4
improving engineering 239–40
recommendations for engineering profession 32–3
US funding for 39, 152, 153–4
of women in study samples 19, 42, 48
Ekemhamar, B. 101, 104, 105, 118, 119
Ely, R.J. 17, 33–4, 129, 141, 171
engagement 29, 30–32, 33, 34–5
engineering profession
gendered nature of see threshold concept
improving education for 239–40
manager/leader role in 117–18
one of highest paying occupations 17–18
one of most sex-segregated occupations 39
and women 17–18, 102–4
engineering tasks outcome expectations 43–4
engineering tasks self-efficacy 43
Engineers Australia (EA) 79, 103, 105–6
EU (European Union) 187, 188
excellence academic, as gendered 198–9
awards for scholarly 166, 167, 170
inclusive 222
publication as hallmark for 179
scientific standard of 193, 198
expertise and skills 89, 111, 116
technical 24, 110–111, 119
faculty composition changes 157–61
family considerations
Australian studies 79–80
integrating work and family
family-friendly employment provision 85–6
identity issues 88–90
long hours 84
penalties for family-friendly policies 86–8
planning for parenthood 82–3
reduced fertility 83–4
women’s attrition 90–91
retention of women engineers 81
strategies for success 91
public or private sector 92–4
sharing childcare 94–5
study conclusions 95–7
fathers 205–6, 214, 219
Faulkner, W. 6, 87, 88, 89, 118, 206, 226, 235, 236
Feldman, D.C. 58, 59, 62, 63, 204, 219
Ferguson, K. 128, 131
Index

fertility 83–4
Fitzpatrick, M. 5, 43, 103
Fleckenstein, A. 6, 150
Fletcher, J.K. 104, 117–18, 226, 234–5, 240
flexible working arrangements 93
focus groups 221, 222
FOM/f (Foundation for Fundamental Research on Matter) program 189–90
Forrier, A. 116, 118, 119
Fouad, N.A. 5, 17, 33, 34, 43, 79, 83, 85, 88, 90, 91, 96, 97, 103
Fox, M.F. 6, 7, 149, 151, 152, 153, 205
Franzway, S. 17, 103, 226, 234
Frehill, L. 17, 79, 81, 86, 87, 90, 91, 93, 97
fulfilment, feeling of 27–8, 34, 73
Gatenby, B. 129, 130
gender bias see bias
gender equality interventions 187–8
methodology 190
discourse analysis 191
Netherlands 188–90
perceptions of policies concern about quality discourse 193–4
necessity discourse 191–3
stigmatization discourse 194–6
reframing ‘getting help’ dilemma 196
academic excellence as gendered 198–9
men’s support system 196–8
study conclusions and implications 199–200
gender equality work, women only groups in 129–30
gender equity see AWARDS
(Advancing Ways of Awarding Recognition in Disciplinary Societies) project
gendered actions
informed decisions about responses to 239
recognising as gendered 238–9
gendered culture 237, 241–2
in engineering faculties 232–4
in engineering workplaces 234–6
gendered, engineering as see threshold concept
genSet 4, 5
‘getting help’ dilemma 11, 196–200
Gill, J. 4, 17, 81, 89, 101, 103, 226, 234, 236, 237
glass obstacle course 6–7
Glover, J. 79, 83, 84, 86, 91
Godfrey, E. 232–3, 236, 237
Goode, J. 193, 197, 200
Greenhaus, J.H. 41, 45
grounded theory 16, 18, 19
Hacker, S. 226, 232, 235, 238
Halford, S. 131, 141
harassment as frequently cited problem 73
prevalence of 103, 236
recognition of 234, 239
teaching scenarios for 241
Hatmaker, D.M. 235–6
Hearn, J. 128, 131, 187
Heilman, M.E. 17, 195
Herrbach, O. 58, 59, 60, 65
Hewlett, S.A. 5, 7, 17, 33, 82, 84, 89–90, 101, 103
Hill, C. 7, 17
Holgersson, C. 128, 131, 187, 197
Höök, P. 129, 130, 133, 187
hope 28–9, 35
Hughes, R. 82, 91
Humphries, M. 129, 130
Hunt, J. 79, 81, 90
Ibarra, H. 17, 33–4, 120, 171, 197
ideal academic norm 150, 204, 205, 206, 221
ideal self 28–30, 34–5
identity in career anchor theory 59
conflict 233, 235–6
core 30
as factor in career attrition 88–90
as factor in career persistence 23–4, 34
Ihsen, S. 237, 239
implications for practice
of career persistence study 32–4
of combining career and care study
220–221
of gender equality study 199–200
of retention within mining industry
study 74–5
inclusive excellence 222
individual attitudes and preferences
118–19
individual attributes and preferences
110–111, 116
inhospitable climate and culture 148–52
institutional transformation
gender equity practices 154–7
institutional culture 155–6
and NSF ADVANCE program 152–4
outcomes 157–61
interpersonal and relational aspects 104,
112–13, 119–20
isolation 149

Johannsen-Schmidt, M.C. 104, 105
‘John’ versus ‘Jennifer’ 17
Jorgenson, J. 17, 18
Joy, S. 5, 18, 187

Kahn, W.A. 30–31
Kanter, R.M. 105, 142
Kaspura, A. 79, 81, 83, 84, 85, 86, 90,
92, 93, 101, 102, 225, 236
Kellerman, B. 104, 105
King, E.B. 204, 205, 222
King, R. 225, 234
Kirkup, G. 79, 81
Kolb, D.H. 17, 33–4, 171

labor potential argument 192
Lamont, M. 187, 196
Land, R. 227, 228, 229
Laursen, S. 6–7
leadership
feminist 130
gender composition 169
glass cliff positions 6
as ‘naturally male’ 150
opportunities, as reason for
remaining in role 69
programs for women 33, 153–4, 161
under-representation of women 148
see also women managers and leaders
leaky pipeline metaphor 4, 7, 146, 166,
168
learning motivation 72
Leboy, P.S. 147, 168, 169, 170
Lent, R.W. 41, 43, 50
Liang, X. 5, 7, 18, 146, 154, 157, 158,
160, 161, 187
Liebig, B. 205, 219, 221
life-roles, managing multiple 44
lifestyle 59, 62, 63–5, 68, 71, 74–5
limitations
of career persistence study 32
of combining career and care study
221–2
of deficit model 239
Lincoln, A.E. 167, 169, 170
Livingston, G. 81
long hours 6, 53, 84, 88, 94, 95
Long, J.S. 5, 149, 152
Lord, L. 73
male-dominated culture 29, 33, 91,
95–6, 127, 192–3, 198–9, 242
Male, S.A. 229, 230, 231, 241, 243
managers, recommendations for 33
see also women managers and leaders
marginalization of women 87, 148–9
Marinelli, M. 86, 103
Marongiu-Ivarsson, S. 104, 118
Marongiu, S. 101, 104, 105, 119
Marshall, V. 60, 61
Martineau, Y. 70, 71
masculine attributes 12, 198–9, 226
maternity leave 83, 85–6, 87, 88, 91, 92,
94, 96, 215–16, 220
Mathematical Association of America
(MAA) 170, 179
mathematical sciences 148, 177, 179
Mattis, M.C. 5, 7, 187
Mayes, R. 71, 73
McIlwee, J.S. 5, 117, 226
meaning and purpose 25–6, 31, 35
Meervoud 190
men’s support system 196–8, 199
meritocracy discourse 195–6, 199–200
Merton, R.C. 196, 198
Index

Meyer, J.H.F. 227, 228, 229
Meyerson, D.E. 129, 131, 141
Mignonac, K. 58, 59, 60, 65
Miller, G.E. 17, 101
Mills, J. 4, 5, 17, 79, 81, 83, 84, 85, 87, 88, 89, 91, 101, 103, 150, 226, 234, 236
Miner-Rubino, K. 45, 50, 53
mining industry, Australia see career anchors study
Mintzberg, H. 104, 117
MIT (Massachusetts Institute of Technology) 148, 149, 188
Moss-Racusin, C.A. 17, 172
motivations see career anchors study
named awards 172, 173
National Academies 3, 17, 146
National Research Council 5, 17, 18, 33
National Science Foundation (NSF) 4, 16, 17, 147, 148, 149, 152, 167, 169
necessity discourse 191–3
Nesbit, P.L. 101, 105
Netherlands equality measures 188–9
Dutch context 189
FOM/f program 189–90
Meervoud 190
Netherlands studies see combining care and career; gender equality interventions
Ng, T.W.H. 58, 116, 118
non-tenure positions 5, 147
Noon, M. 187, 194, 198, 200
norms 11–12
coping with 204–7, 208–9
creating new 205, 216–18, 220
future research 222
ideal academic 150, 204, 205, 206, 221
as important component of organizational culture 204
navigation 205, 214–16, 219–20
negotiation 208–9, 211–14, 219
nomination 204–5, 209–11, 219
novelty
as factor in career persistence 26–7, 29–30, 35
as part of career anchor 65, 72
Nowak, M. 73
NWO (Netherlands Organization for Scientific Research) 190
old boy’s network 6–7
O’Neil, D.A. 6, 57, 118, 119
opportunities for advancement see advancement opportunities
opting out
identity 24
meaning and purpose 26
outlook 25
self-efficacy 24–5
unfulfilment 27, 28
organizational barriers 50–51
organizational change
defining 139
events 114
issue of importance to 162
required initiatives 156
strategy to achieve 141
organizational culture 114, 204, 222
organizational initiatives 10–11
see also academic STEM; AWARDS project; women as power resources
organizational norms see norms
organizational outcome expectations 44
organizational process 114
organizational self-efficacy 44
organizational support 46, 50, 53
Parasuraman, S. 41, 45
parenthood, planning for 82–3
Parker, L. 232–3, 236, 237
part time work
abolishing prohibition of 221
availability of 92, 93, 94, 96
and childcare responsibility 86, 94–5, 216–17
differences in uptake of 103
difficulty in obtaining 91
penalties for 87–8
Pelos, S. 58, 59
people skills 69–70, 108–9
Perelli, S. 16, 35, 51
Women in STEM careers

persistence see career persistence study 1 & 2
Pini, B. 71, 73
pipelines
  initiatives 10, 154–5, 156
  leaky, metaphor 4, 7, 146, 166, 168
talent 7
Plett, M. 79, 88, 90, 91, 93
Poelmans, S. 204–5, 208, 218, 219, 220
Popejoy, A.B. 170
positive outlook 25, 29, 34
positive relationships 69
Powell, A. 88, 206, 226, 233, 237, 241
power resources see women as power
  resources
POWRE (Professional Opportunities
  for Women in Research and
  Education) program 152–3
pregnancy 89
Preston, A.E. 82, 88, 149
private sector 17, 85, 92–4, 96–7, 149
professional societies 166–7, 168,
  176–80, 181–2
professor positions 127, 140, 147–8,
  159–61, 188, 189, 190, 192, 195, 197
public sector 85, 92–4, 96
qualifications 5, 174–5, 193
qualitative research 19
quality discourse 193–4, 198
Quesenberry, J. 58, 59
recognition 68–9, 89, 151, 166–8, 169,
  173–4, 240
reflective practice 242
relational aspects 74–5, 104, 108–9,
  117–18, 119–20, 234–5
research
  feminist 128, 131, 132
  focus of 7–8
  future 34, 52, 66, 222
  methods see individual study
  methodologies
retention of women engineers 16, 17,
  40, 81, 96, 155
  see also career anchors study
reward 58, 59, 68–9, 167, 169
Rhode, D. 104, 105
Roberts, P. 79, 84, 103
Robinson, J.G. 5, 117, 226
Rodrigues, R. 65, 70, 71, 72
role model argument 192
role models
  lack of 5, 6, 129
  limited access to 149
  male role as 218
  who ‘dare to care’ 221
role-play 171, 241, 242
role segregation 238–9
Rosser, S.V. 149, 152
Rouse, C. 17, 171
Rubineau, S. 18, 33, 52, 91
Saks, A.M. 31, 32
Sappleton, N. 84, 86
Schaufeli, W.B. 31, 32
Scheibinger, L. 204, 205
scholarly recognition
  importance of 167–8
  from large societies 169
  of women, steps towards 173–4
  security 58, 59, 62, 63, 64, 69, 71, 93–4
Seeger, T. 101, 105
selection committees 174–6
self confidence 51–2, 53, 198
self-discrepancy 28–9
self-efficacy
  beliefs among persisters and
  non-persisters 49–50, 52
  definition of 40–41
  engineering tasks 43
  as factor in career persistence 24–5,
    29, 72, 73
  managing multiple life-roles 44
  mechanisms for development 32–3
  organizational 44
  protecting 236, 242
Seron, C. 18, 33, 52, 91
sexist attitudes 96
Sharp, R. 17, 96, 226, 234
showpieces 195–6
Silbey, S. 18, 33, 52, 91
Silva, C. 7, 120
Index

Singh, R. 5, 17, 33, 34, 73, 79, 83, 85, 88, 90, 91, 96, 97
site experience 112
social capital 119
social cognitive career management theory (SCCMT) 9, 40–41, 51–2
social support 46, 50
social undermining 9, 45–6, 51, 53, 87
Society for Industrial and Applied Mathematics (SIAM) 170, 179–80
Society for Neuroscience (SfN) 170, 180
socio-technical competencies 234, 239–40
stereotypes 12, 104–5, 117, 171, 198–9, 221, 226, 232, 233
stigmatization discourse 194–6
stimulation 65, 67, 71
Stobbe, L. 150, 187, 190, 195, 197
Stout, J.G. 18, 57
Strauss, A. 19, 32, 208
subdisciplinary awards 172–3
subordination 131
supervisors, perceived support from 46, 50
Sweden see women only change project
Takruri-Rizk, H. 84, 86
talent pipeline 7
technical knowledge 111–12
technical university, studies involving see combining care and career; family considerations; women as power resources
tempered radicals 131
tenure positions 5–6, 48–9, 147–8, 151, 155, 190
Teo, T. 72, 73
Tharenou, P. 101, 104, 105, 118, 119
threshold concept 225–7
improving engineering education 239–40
improving engineering practice 240
improving gender inclusivity in universities and workplaces 238–9
as irreversible and discursive 240–241
process of identifying 229–31
study conclusions 242
Teaching recommendations 241–2
that engineering is gendered
gendered culture in engineering faculties 234–5
gendered culture in engineering workplaces 234–6
tip theory 12, 227–9
as transformative 238
as troublesome 236–7
timing of awards 173
tipping points 30
token theory 195
Tonso, K.L. 89, 232
transport sector 93, 96
Traweek, S. 194, 198
Tremblay, M. 59, 65, 67
Trevelyan, J.P. 118, 119, 235, 236
turnover intentions 41, 43, 48, 51
turnover predictors 51
turnover theory 41
UK (United Kingdom)
delaying having first child 84
gendered cultures in engineering 233, 235
number of women with children 83
penalties for family-friendly policies 88
retention problem of women in STEM 81, 90
under-representation of women in academia 147–8
among nominees in chemistry 176–7
ingineering profession 16, 225–6
as global phenomenon 187
issues impacting on 5–6
undermining see social undermining
US (United States)
delaying having first child 84
gendered cultures in engineering 234–5, 235–6
retention problem of women in STEM 17, 81, 90
see also academic STEM
Valian, V. 5, 149, 151, 198
validation 102, 113
value-based career anchors 62, 63, 69–70, 75
value, feeling of 27–8, 31, 35, 156, 167–8, 236
van den Brink, M. 150, 187, 190, 194, 195, 196, 197, 198
van Engen, M.L. 204, 205, 207, 221
Vinkenburg, C.J. 204, 205, 207
Vinnicombe, S. 6, 119, 129
visibility 102, 113
voting 176
wage gaps 127
Wahl, A. 128, 129, 130, 131, 133
Watts, J.H. 17, 82, 84, 88, 101
Wayne, S.J. 47, 50
West, M.S. 147, 149
window-dressing 150
withdrawal intentions 41, 51, 54
women as power resources 10, 127–8
design of project 131–2
meetings and themes 134–5
promoting women’s influence in action 132–3
impact of project 140–141
lessons learned 142–3
methodology 136–7
negotiations
accountability 139
defining change 139
naming 137–8
resources 138–9
separatist groups 138
project discussion 141–2
theoretical concept 128
women only groups in gender equality work 129–30
Women in Mining Canada 71, 73
women in STEM careers introduction 3–8
women managers and leaders 101–2
advancement to managerial and leadership roles 104–5
insights from 106
making the move 113–16
manager/leader role 107–9
transition foundations 109–13
study and methodology 105–6
study conclusions 120
study discussion 116–17
individual attitudes and preferences 118–19
interpersonal and relational aspects 119–20
manager/leader role 117–18
women in engineering profession 102–4
women only change project see women as power resources
women only training programs 129–30
Womeng Consortium 82, 85, 86, 88
WOPI 187, 189
work environment
as career anchor 69–70
hostile 5, 18, 46, 148–52
supportive 53
work–family conflict see combining care and career
work–life benefit availability and use 47, 50, 52, 53
work–life culture 47, 52, 53
workforce participation in academic STEM 147–52, 161–2
workplace incivility 46
Wormley, W.M. 41, 45
worthwhile, feeling 27–8, 30–31