The NLMIXED Procedure

Specifications	
Data Set	WORK.A
Dependent Variable	y
Distribution for Dependent Variable	Binary
Random Effects	u
Distribution for Random Effects	Normal
Subject Variable	id
Replicate Variable	count
Optimization Technique	Dual Quasi-Newton
Integration Method	Adaptive Gaussian Quadrature

Dimensions	
Observations Used	128
Observations Not Used	0
Total Observations	128
Subjects	537
Max Obs per Subject	4
Parameters	4
Quadrature Points	7

Parameters				
int_	**ms_**	**age_**	**sigmasq**	**NegLogLike**
-2	0.3	-0.1	2	823.813073

Iteration History						
Iter		**Calls**	**NegLogLike**	**Diff**	**MaxGrad**	**Slope**
1		4	816.782162	7.030911	64.0387	-352.027
2		6	813.481104	3.301058	27.90562	-135.719
3		10	799.791364	13.68974	9.017651	-33.7082
4		14	797.962844	1.82852	7.683408	-2.03949
5		16	797.502945	0.459899	2.820324	-0.67974
6		19	797.394585	0.10836	1.218485	-0.18875
7		22	797.389771	0.004814	0.036613	-0.00791
8		25	797.389645	0.000126	0.008894	-0.0002
9		28	797.389645	8.529E-7	0.001108	-9.71E-7

NOTE: GCONV convergence criterion satisfied.

The NLMIXED Procedure

Fit Statistics	
-2 Log Likelihood	1594.8
AIC (smaller is better)	1602.8
AICC (smaller is better)	1603.1
BIC (smaller is better)	1619.9

Parameter Estimates

Parameter	Estimate	Standard Error	DF	t Value	Pr > |t|	Alpha	Lower	Upper	Gradient
int_	-3.1079	0.2184	536	-14.23	<.0001	0.05	-3.5370	-2.6789	-0.00111
ms_	0.4006	0.2736	536	1.46	0.1438	0.05	-0.1369	0.9380	0.00022
age_	-0.1752	0.06757	536	-2.59	0.0098	0.05	-0.3079	-0.04242	0.000854
sigmasq	4.6875	0.7759	536	6.04	<.0001	0.05	3.1633	6.2118	-0.00031

The NLMIXED Procedure

Specifications	
Data Set	WORK.A
Dependent Variable	y
Distribution for Dependent Variable	Binary
Random Effects	u
Distribution for Random Effects	Normal
Subject Variable	id
Replicate Variable	count
Optimization Technique	Dual Quasi-Newton
Integration Method	Adaptive Gaussian Quadrature

Dimensions	
Observations Used	128
Observations Not Used	0
Total Observations	128
Subjects	537
Max Obs per Subject	4
Parameters	4
Quadrature Points	25

Parameters				
int_	**ms_**	**age_**	**sigmasq**	**NegLogLike**
-2	0.3	-0.1	2	823.848456

Iteration History						
Iter		**Calls**	**NegLogLike**	**Diff**	**MaxGrad**	**Slope**
1		4	816.835924	7.012532	63.98233	-351.65
2		6	813.562632	3.273291	27.89697	-135.395
3		10	800.014955	13.54768	8.878477	-33.4777
4		14	798.234084	1.780871	7.669872	-1.99494
5		16	797.772294	0.461789	2.869633	-0.67891
6		19	797.654631	0.117663	1.348099	-0.20208
7		22	797.64854	0.006092	0.057206	-0.00978
8		25	797.648356	0.000184	0.012342	-0.00029
9		28	797.648354	1.704E-6	0.002101	-1.99E-6

NOTE: GCONV convergence criterion satisfied.

The NLMIXED Procedure

Fit Statistics	
-2 Log Likelihood	1595.3
AIC (smaller is better)	1603.3
AICC (smaller is better)	1603.6
BIC (smaller is better)	1620.4

Parameter Estimates

Parameter	Estimate	Standard Error	DF	t Value	Pr > |t|	Alpha	Lower	Upper	Gradient
int_	-3.1016	0.2190	536	-14.16	<.0001	0.05	-3.5319	-2.6713	-0.00178
ms_	0.3986	0.2731	536	1.46	0.1450	0.05	-0.1378	0.9351	0.000225
age_	-0.1756	0.06768	536	-2.59	0.0097	0.05	-0.3086	-0.04268	0.002101
sigmasq	4.6867	0.8008	536	5.85	<.0001	0.05	3.1136	6.2599	-0.00046

The CONTENTS Procedure

Data Set Name	WORK.U	**Observations**	128
Member Type	DATA	**Variables**	15
Engine	V9	**Indexes**	0
Created	11/26/2018 16:30:51	**Observation Length**	120
Last Modified	11/26/2018 16:30:51	**Deleted Observations**	0
Protection		**Compressed**	NO
Data Set Type		**Sorted**	NO
Label			
Data Representation	WINDOWS_32		
Encoding	wlatin1 Western (Windows)		

Engine/Host Dependent Information	
Data Set Page Size	65536
Number of Data Set Pages	1
First Data Page	1
Max Obs per Page	545
Obs in First Data Page	128
Number of Data Set Repairs	0
ExtendObsCounter	YES
Filename	C:\Users\qaqish\AppData\Local\Temp\SAS Temporary Files_TD3880_BUCCINATOR_\u.sas7bdat
Release Created	9.0401M1
Host Created	W32_7PRO

Alphabetic List of Variables and Attributes

#	Variable	Type	Len	Label
13	Alpha	Num	8	Alpha
10	DF	Num	8	Degrees of Freedom
14	Lower	Num	8	Lower Confidence Limit
8	Pred	Num	8	Predicted Value
12	Probt	Num	8	Pr > |t|
9	StdErrPred	Num	8	Standard Error of Prediction
15	Upper	Num	8	Upper Confidence Limit
5	age	Num	8	Child's age (years) - 9
6	agefactor	Num	8	
3	count	Num	8	Number with this pattern
1	id	Num	8	
2	ms	Num	8	Mother smoking 0=no 1=yes

The CONTENTS Procedure

Alphabetic List of Variables and Attributes				
#	**Variable**	**Type**	**Len**	**Label**
7	msxage	Num	8	Age x MS
11	tValue	Num	8	t Value
4	y	Num	8	Respiratory illness 0=no 1=yes

Predicted random effects (posterior mode)

Obs	id	ms	age	Pred	StdErrPred	Lower	Upper
1	1	0	-2	-0.53395	1.75797	-3.98730	2.91940
2	1	0	-1	-0.53395	1.75797	-3.98730	2.91940
3	1	0	0	-0.53395	1.75797	-3.98730	2.91940
4	1	0	1	-0.53395	1.75797	-3.98730	2.91940
5	2	0	-2	1.43853	1.14814	-0.81688	3.69393
6	2	0	-1	1.43853	1.14814	-0.81688	3.69393
7	2	0	0	1.43853	1.14814	-0.81688	3.69393
8	2	0	1	1.43853	1.14814	-0.81688	3.69393
9	3	0	-2	1.43853	1.14814	-0.81688	3.69393
10	3	0	-1	1.43853	1.14814	-0.81688	3.69393
11	3	0	0	1.43853	1.14814	-0.81688	3.69393
12	3	0	1	1.43853	1.14814	-0.81688	3.69393
13	4	0	-2	2.46913	0.96642	0.57069	4.36756
14	4	0	-1	2.46913	0.96642	0.57069	4.36756
15	4	0	0	2.46913	0.96642	0.57069	4.36756
16	4	0	1	2.46913	0.96642	0.57069	4.36756
17	5	0	-2	1.43853	1.14814	-0.81688	3.69393
18	5	0	-1	1.43853	1.14814	-0.81688	3.69393
19	5	0	0	1.43853	1.14814	-0.81688	3.69393
20	5	0	1	1.43853	1.14814	-0.81688	3.69393
21	6	0	-2	2.46913	0.96642	0.57069	4.36756
22	6	0	-1	2.46913	0.96642	0.57069	4.36756
23	6	0	0	2.46913	0.96642	0.57069	4.36756
24	6	0	1	2.46913	0.96642	0.57069	4.36756
25	7	0	-2	2.46913	0.96642	0.57069	4.36756
26	7	0	-1	2.46913	0.96642	0.57069	4.36756
27	7	0	0	2.46913	0.96642	0.57069	4.36756
28	7	0	1	2.46913	0.96642	0.57069	4.36756
29	8	0	-2	3.31202	0.95346	1.43904	5.18501
30	8	0	-1	3.31202	0.95346	1.43904	5.18501
31	8	0	0	3.31202	0.95346	1.43904	5.18501
32	8	0	1	3.31202	0.95346	1.43904	5.18501

Predicted random effects (posterior mode)

The FREQ Procedure

Predicted Value				
Pred	Frequency	Percent	Cumulative Frequency	Cumulative Percent
-0.680963391	118	21.97	118	21.97
-0.533948775	237	44.13	355	66.11
1.1458406826	32	5.96	387	72.07
1.4385279242	65	12.10	452	84.17
2.1448302916	19	3.54	471	87.71
2.4691259332	25	4.66	496	92.36
2.985642011	11	2.05	507	94.41
3.3120245804	12	2.23	519	96.65
3.9477010837	7	1.30	526	97.95
4.2509841443	11	2.05	537	100.00

The MEANS Procedure

Analysis Variable : Pred Predicted Value				
N	Mean	Std Dev	Minimum	Maximum
537	0.3216624	1.3799113	-0.6809634	4.2509841

Predicted random effects (posterior mode)

Obs	id	count	ms	y7	y8	y9	y10	s	Pred
1	17	118	1	0	0	0	0	0	-0.68096
2	1	237	0	0	0	0	0	0	-0.53395
3	21	8	1	0	0	1	0	1	1.14584
4	19	11	1	0	1	0	0	1	1.14584
5	18	7	1	1	0	0	0	1	1.14584
6	25	6	1	0	0	0	1	1	1.14584
7	2	24	0	1	0	0	0	1	1.43853
8	9	10	0	0	0	0	1	1	1.43853
9	5	15	0	0	0	1	0	1	1.43853
10	3	16	0	0	1	0	0	1	1.43853
11	29	2	1	0	0	1	1	2	2.14483
12	27	1	1	0	1	0	1	2	2.14483
13	23	6	1	0	1	1	0	2	2.14483
14	22	3	1	1	0	1	0	2	2.14483
15	20	4	1	1	1	0	0	2	2.14483
16	26	3	1	1	0	0	1	2	2.14483
17	13	4	0	0	0	1	1	2	2.46913
18	10	3	0	1	0	0	1	2	2.46913
19	11	2	0	0	1	0	1	2	2.46913
20	7	7	0	0	1	1	0	2	2.46913
21	6	3	0	1	0	1	0	2	2.46913
22	4	6	0	1	1	0	0	2	2.46913
23	31	4	1	0	1	1	1	3	2.98564
24	30	1	1	1	0	1	1	3	2.98564
25	28	2	1	1	1	0	1	3	2.98564
26	24	4	1	1	1	1	0	3	2.98564
27	15	3	0	0	1	1	1	3	3.31202
28	14	2	0	1	0	1	1	3	3.31202
29	12	2	0	1	1	0	1	3	3.31202
30	8	5	0	1	1	1	0	3	3.31202
31	32	7	1	1	1	1	1	4	3.94770
32	16	11	0	1	1	1	1	4	4.25098
		537							

The GENMOD Procedure

Model Information		
Data Set	WORK.A	
Distribution	Binomial	
Link Function	Logit	
Dependent Variable	y	Respiratory illness 0=no 1=yes
Frequency Weight Variable	count	Number with this pattern

Number of Observations Read	128
Number of Observations Used	128
Sum of Frequencies Read	2148
Sum of Frequencies Used	2148
Number of Events	326
Number of Trials	2148

Class Level Information		
Class	**Levels**	**Values**
id	32	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
agefactor	4	-2 -1 0 1

Response Profile		
Ordered Value	**y**	**Total Frequency**
1	1	326
2	0	1822

PROC GENMOD is modeling the probability that y='1'.

Parameter Information	
Parameter	**Effect**
Prm1	Intercept
Prm2	ms
Prm3	age

Algorithm converged.

The GENMOD Procedure

GEE Model Information	
Correlation Structure	Exchangeable
Within-Subject Effect	agefactor (4 levels)
Subject Effect	id (32 levels)
Number of Clusters	32
Correlation Matrix Dimension	4
Maximum Cluster Size	4
Minimum Cluster Size	4

Algorithm converged.

Working Correlation Matrix				
	Col1	**Col2**	**Col3**	**Col4**
Row1	1.0000	0.3541	0.3541	0.3541
Row2	0.3541	1.0000	0.3541	0.3541
Row3	0.3541	0.3541	1.0000	0.3541
Row4	0.3541	0.3541	0.3541	1.0000

Exchangeable Working Correlation	
Correlation	0.354139785

GEE Fit Criteria	
QIC	1829.4747
QICu	1825.8927

Analysis Of GEE Parameter Estimates						
Empirical Standard Error Estimates						
Parameter	**Estimate**	**Standard Error**	**95% Confidence Limits**		**Z**	**Pr > |Z|**
Intercept	-1.8804	0.1139	-2.1037	-1.6572	-16.51	<.0001
ms	0.2651	0.1777	-0.0833	0.6135	1.49	0.1359
age	-0.1134	0.0439	-0.1993	-0.0274	-2.59	0.0097