

Quantifying Stability and Change in Ethnic Group

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We investigate the stability of individuals' affiliation to ethnic group categories using the Office for National Statistics Longitudinal Study of England and Wales linked between the Censuses of 1991 and 2001. Membership of the White category is stable; between seven and nine per cent of those recorded in an Asian group in 1991 have changed to a different group by 2001; 23 per cent of each of the Caribbean and African groups have changed. We quantify the separate influences of question unreliability, changes in categories, and conscious change of affiliation, finding that the latter contributes little instability over the period 1991–2001. The unreliability of the question is significant, due partly to the ambiguity of the categories for some people, and partly to imprecise imputation of missing values. We report the best correspondence between the different classifications used in 1991 and 2001 using empirical measures of fit.

Key words: Race; reliability; longitudinal; census.

1. Introduction

Classification of the human population using the concepts of “race,” ethnicity, skin colour, cultural origin, or country of descent is a common but contested practice on all continents (Kertzer and Arel 2002; Coleman and Salt 1996). Although these concepts are not equivalent, they are used in similar ways, often as demographic variables in national censuses and surveys. In many countries, including the United Kingdom, a single classification incorporates several of the above concepts (Aspinall 2002). To refer to these classifications this article uses the term “ethnic group,” as in the censuses and surveys of the UK.

Ethnic group classifications are used to identify relatively distinct populations and to monitor their social conditions. The collection of ethnic group data is often justified to implement legislation aimed at reducing social disparities stemming from racial or cultural discrimination. In many countries, ethnic group categories also identify groups of recent migrant origin, and ethnic group data are also used in debates on international migration policy. The size of group populations and their characteristics are monitored over time to assess the success or otherwise of anti-discrimination and immigration policies. Coleman and Salt's survey of census questions on ethnicity

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reveals considerable international differences of practice in census questions on ethnicity, race and related topics. These reflect the historical origins of nations and perceptions as to their ancient unity or ethnic diversity, the volume and origins of their recent immigration streams, and the policy responses to ethnic diversity arising from different national constitutional traditions and political pressures. In choosing to ask a census question on ethnic origin directed to minorities of recent immigrant origin, Britain has made itself unique in Europe (Coleman and Salt 1996, p. 26).

They also note the similarity of policy context in Britain, the U.S.A., Australia, New Zealand, South Africa, and Canada relating to ethnic monitoring and targets and legal recognition of group rights. Elsewhere the same groups are measured not through labels of cultural or family origin, but through measurement of parental and grandparental birthplace, as was past practice in the UK and is current practice in France (Tribalat 2004).

Used in these ways, an ethnic group classification implies that ethnicity is a stable characteristic throughout an individual's lifetime. The growth, geographical settlement and conditions of populations defined by ethnic group questions are interpreted as the movement of distinct groups across time and space, and their changing social conditions. However, the instability of ethnic group has been found to be neither insignificant nor random in contexts outside the UK (Harris and Sim 2002; Ní Laoire 2003). In addition to the unreliability associated with recording answers, people respond to questions about ethnicity within the constraints of the categories offered to them, aware not only of their personal self-identification but also of the social acceptability of each category. The UK statistical office accepts that "any ethnic group label is only valid for the period and context in which it is used" (ONS 2003a, p. 11), accepting an inherent instability in the categories of ethnic group which "in British government research. . . are differentiated based on a combination of categories including race, skin colour, national and regional origins, and language" (ibid, p. 7).

1.1. Implications of Change in Ethnic Group

The recording of an ethnic or racial category may change in three ways fundamental to demography: between cohorts, at different ages, and at different time periods. For example, far more new people identified themselves as American Indian in the U.S. 1990 Census than could be consistent with the 1980 Census records (Passell 1995; Nagel 1995); similarly the increase of 46 per cent in Aboriginal and Torres Strait Islanders between the Australian Censuses of 1981 and 1986 reflected "an increase in the propensity to identify themselves as such in the Census" (Evans et al. 1993). In Trinidad, the count of young adult Africans grew rapidly after the successes of the Black Power movement in the 1960s. These changes can be seen as reflecting cohort experiences of socio-political movements. Age also has an effect on stability of ethnic group, especially since different systems record information at birth, in childhood and in adulthood, involving proxy information given by public service staff and parents on behalf of children. Thus many babies registered as Mixed at birth were recorded as African in childhood by their parents in British Guiana in the 1940s (Kuczynski 1953,

p. 180). Finally, changes in the composition of ethnic groups over time are particularly associated with question changes, as we shall see in the case of the UK between the 1991 and 2001 Censuses.

As multiple ethnic identities become more common and more reported, ethnic group will become increasingly difficult to measure. In the U.S.A., the complexity of measuring White ancestry has recently been noted (Waters 2000), and a revised race categorisation in 2000 has required a bridge between the old and new classification (Allen et al. 2001; OMB 2000). This changeability poses problems for the use of an ethnic group classification to monitor social conditions and to assess the success of measures to combat discrimination. Once we accept that classifications and individuals' allegiance to them are unstable, can we compare statistics of ethnic group population size and conditions across time? What ambiguities and errors may occur and how can we best measure and minimise them? This article addresses these questions specifically in relation to England and Wales over the time period 1991–2001.

The practical question for many researchers is the compatibility of groups from one census to the next. In England and Wales standard output from the 2001 Census has 16 categories, as compared to the 10 from the 1991 Census. Section 2 specifies and presents evidence on three sources of instability in ethnic group. In the following section, we propose various measures of stability and change in ethnic group, and apply them using longitudinal data for England and Wales. Next we address the possible methods of collapsing the 1991 and 2001 ethnic group classifications in the search for a stable set of common categories. We conclude with a discussion both of the practical implications of our findings for social research and of the means of further understanding the use of ethnicity variables over time.

2. Ethnic Group Classifications: Three Sources of Instability

There are three, conceptually distinct, sources of instability when ethnic group is measured for the same individuals over time: unreliability in measurement, change due to question changes and conscious changes in identity.

2.1. Unreliability

All survey measurement entails some unreliability: if an item is measured twice in the same way and under the same conditions, the outcome may be different because of errors (of response, transcription or coding) or question ambiguity. In the 2001 Census, there were 3.9 million answers coded from write-in answers to the ethnic group question (ONS 2004a), more than expected and 8 per cent of the enumerated population. Coding of write-in answers was most difficult for people who identified themselves as mixed. In addition, there were errors which resulted in significant numbers of people of Indian, Pakistani or Bangladeshi origin incorrectly being classified as "Other Asian" (ONS 2004a). Errors may also arise when an item is estimated or "imputed" for a respondent who has missed a question or not given a valid response. Such imputation is a common practice in censuses in order to achieve multiple cross-tabulations based on a consistent denominator of the whole population (ONS 2003b).

The 1991 Census Validation Survey directly measured the reliability of the ethnic group question, reporting the percentage of people changing their broad ethnic group between the 1991 Census and an interview conducted four to six weeks after the Census. The results showed much less reliability for the Black and “Other” groups than for Asians, and most reliability for the White group (Table 1). The residual group “Other” was particularly unreliable, with 20 per cent changing from it when asked a second time. Over 10 per cent of those who chose one of the Black groups in the 1991 Census changed to a group other than Black in the Census Validation Survey. The equivalent cross-tabulation from the matched records between the 2001 Census and the Census Coverage Survey is not available from the Office for National Statistics at the time of writing.

2.2. Question Changes

2.2.1. Changes to the England and Wales Census Ethnic Group Question

Although the ethnic group question was asked directly in the 1991 and 2001 Censuses, a variety of changes are evident from the reproduction of the two questions in Figures 1 and 2. In 2001 respondents were asked to tick or write in their “cultural background,” while in 1991 the note uses the terms “descended” and “ancestry,” giving more emphasis to family rather than cultural origins. Culture and ancestry are not the same, and indeed both have been asked in the Canadian census. In 2001, tick boxes were grouped into five sections with space for a write-in answer within each one, while in 1991 there were just two write-in spaces. These changes can be considered developments of the original 1991 question.

Five new categories in the 2001 question can be considered as intentional developments of policy. The inclusion of “White Irish” responded to lobbying for the recognition of poor social conditions on average not only for Irish-born but their families born in Britain (Walter 1998; Walls 2001); the inclusion of Mixed categories responds both to lobbying by groups concerned at the special issues faced by children of parents from different ethnic groups and the growing number of mixed-origin residents estimated correctly before the census at more than 10 per cent of all residents not of White origin (Aspinall 2001).

The expansion of “White” in order to include “Irish” had further consequences. While in Scotland the option of “Scottish” was added (Walls 2001), the omission of “Welsh” in the form used in Wales caused political debate; the title British attached only to a White

Table 1. Reliability of ethnic group in the 1991 Census, per cent choosing each category in validation survey

Ethnic group at 1991 Census	Ethnic group at quality check 4–6 weeks after the 1991 Census				All = 100%
	White	Black	South Asian	Other	
White	99.6	0.1	.	0.3	12,017
Black	1.5	88.0	1.6	8.8	264
South Asian	0.2	0.1	98.7	1.0	669
Other	9.6	11.3	1.0	78.1	130

Source: 1991 Census Validation Survey, reproduced from OPCS (1994).

Each per cent based on weighted sample numbers; cell counts not given in the report.

Ethnic group	
Please tick the appropriate box	
If the person is descended from more than one ethnic or racial group, please tick the group to which the person considers he/she belongs, or tick the 'Any other ethnic group' box and describe the person's ancestry in the space provided.	White <input type="checkbox"/> 0 Black-Caribbean <input type="checkbox"/> 1 Black-African <input type="checkbox"/> 2 Black-Other <input type="checkbox"/> <i>please describe</i> <input style="width: 100%; height: 15px;" type="text"/>
	Indian <input type="checkbox"/> 3 Pakistani <input type="checkbox"/> 4 Bangladeshi <input type="checkbox"/> 5 Chinese <input type="checkbox"/> 6 Any other ethnic group <input type="checkbox"/> <i>please describe</i> <input style="width: 100%; height: 15px;" type="text"/>

Fig. 1. 1991 census question: ethnic group

tick-box was criticised when proposed because it related to nationality (Aspinall 2000) and was unfortunate because it attracted some residents of British nationality who were not in fact White (Simpson and Brown forthcoming; ONS 2006, p. 27).

Other changes were intended to achieve a more efficient record of ethnic group in 2001 than the first attempt in 1991. Following feedback that many young people of Caribbean descent wished to be acknowledged as British, the 2001 labelling included the headings "Black or Black British" and "Asian or Asian British." The Mixed categories can also be seen as an attempt to reduce the number of write-in answers from those who would have found the 1991 categories limiting.

Finally, write-in responses were coded differently in 2001. In particular, in 2001, the "Other Asian" category was composed mainly of those who wrote in a response under "Asian or Asian British," whereas in 1991 "Other Asian" was created from those who indicated "unmixed" Asian origins in the space for "Any other ethnic group." In 1991, responses to the "Any other ethnic group" write-in box were divided between "Asian" and "Others," creating a total of 10 standard output categories of ethnic group from the nine response spaces in the question. In 2001, there were 16 standard output categories corresponding to the response spaces in the question.

Further development of the question has already been recommended within the Office for National Statistics which runs the census, to include parallel questioning of "national identity" with options of English, Welsh, Scottish, Irish, British or Other (ONS 2003a). Although various question formats were tested in focus groups and the test censuses before 2001 (Dixie 1998), the final choice of question format is also based on judgements of the current cultural and political context. In these many ways, question change produces instability in the classification over time.

2.2.2. The Effect of Question Change in the Labour Force Survey

The Labour Force Survey (LFS) asked both the 1991 and 2001 Census questions of the same people, permitting assessment of the combined effect of wording changes and unreliability. The survey was administered to one cohort in 2000–2001, with an interval of one year between questions (Smith 2002). Table 2 gives the broad cross-classification of answers, omitting nonrespondents.

8 What is your ethnic group?

Choose ONE section from A to E, then ✓ the appropriate box to indicate your cultural background.

A White

British Irish

Any other White background, please write in

B Mixed

White and Black Caribbean

White and Black African

White and Asian

Any other Mixed background, please write in

C Asian or Asian British

Indian Pakistani

Bangladeshi

Any other Asian background, please write in

D Black or Black British

Caribbean African

Any other Black background, please write in

E Chinese or other ethnic group

Chinese

Any other, please write in

Fig. 2. 2001 census question: ethnic group

Table 2. *Reliability of ethnic group in the Labour Force Survey, when 1991 and 2001 classifications are asked of the same cohort*

1991 ethnic categories asked in first wave	2001 ethnic categories asked in fifth wave					All = 100%
	White	Mixed	Black	Asian	Other	
White	99.3	0.3	0.1	0.2	0.2	66,104
Black	6.6	7.8	82.6	0.7	2.2	1,074
South Asian	2.8	1.3	0.1	95.2	0.7	1,840
Other	22.0	23.6	6.7	20.8	26.9	1,257

Source: Labour Force Survey 2001; per cent of 1991 category choosing each 2001 category.

The stability of the White category is high, unaffected by the introduction of three new categories. The Other category, however, is exceptional, as many fewer people in the LFS gave the “Other” response using the 2001 question. Unlike the census question, the LFS was administered by interview; for the 2001 question, respondents had to opt for one of the five new broad categories before knowing if the finer sub-categories would suit them. The new Mixed category takes the greatest proportion away from those who previously had chosen Black or Other labels (Table 2). However, the large White category contributes more than one third of the Mixed.

2.3. *Conscious Choice of a Different Label*

Change in ethnic group between two points in time may be due to shifts in consciously held identity, independent of changes to the question asked. In an epoch when the politics of identity are important both in national developments and on the world stage, conscious change of identity is a strong focus of sociological study. The considerable literature on the social construction of racial and ethnic identity emphasises its dependence on personal and wider context over and above fixed demographic origins, which is also accepted by statistical agencies that create the classifications used in censuses. Jenkins distinguishes between “two interacting but independent entailments” (1994, p. 218) in identity: nominal identity (the name) and virtual identity (the experience). Conscious change in identity reveals the interaction between the “nominal” and “lived” ethnicity.

Specific events that trigger acceptance of new labels are not easily identified, but it appears that changed personal circumstances allow a reconsideration of identity, such as migration to a country with racialised discourses (Howard 2003; Samers 2003), and this might also apply to leaving the family home. A greater adoption of multiple racial origins in school than at home, at a time of public acceptance of diversity in the U.S.A., led Harris and Sim to conclude that “Greater anonymity leads to racial classifications that are more consistent with contemporary understandings of race” (2002, p. 624). Additionally, members of an immigrant community tend to “live locally but think globally” (Anthias 1998; Clifford 1994), such that acceptable labels of identity are influenced by overseas and international events as well as by the local framework of statistical agencies.

Shifts of cultural acceptance of the American Indian label in the U.S.A. and the Black label in the Caribbean have already been referred to, but in Britain between April 1991 and April 2001 no great shifts in political or social forces that might affect allegiance to labels

Table 3. *The 1991–2001 LS sample in terms of tracing and linkage*

	Present in 2001	Not present in 2001	Total
Total LS sample present at the 1991 Census	419,096	124,788	543,884
Traced 1991 sample ⁽¹⁾	418,207	116,811	535,018
Traced sample known to have died or embarked by 2001 Census	–	59,637	59,637
Sample eligible to be found in 2001	418,207	57,174	475,381
Untraced 1991 sample	889	7,977	8,866

(1) Traced means the LS members' records were found in the National Health Service Central Register by the time of the 1991 Census.

Source: ONS Longitudinal Study.

of ethnic group could be identified by the authors. Perhaps the biggest observable shift of ethnic allegiance is motivated by the census itself, by its provision of Mixed as an option which, as we shall see, was taken up by many who had chosen a single origin in the 1991 Census. If official labelling can itself encourage a shift of perception and identity, we cannot entirely disentangle the instability caused by question changes and by consciously held allegiances. These changes in personal allegiance are of great interest but are not the focus of the current article; inasmuch as British census data can identify them, they will be reported in a separate study of the social correlates of instability.

3. Measures of Stability in Ethnic Group Classification, and Their Application in England and Wales

The ONS Longitudinal Study of England and Wales (LS) does not separately measure the three sources of instability described above: unreliability, question changes, and shifts in consciously held identity. However, we can assess the impact of conscious changes of identity as a residual component of change, after accounting for unreliability and question change. This section presents evidence quantifying stability in ethnic group using the LS, which is interpreted in the light of evidence from the Census Validation Survey (Table 1) and the LFS (Table 2) to quantify the amount of change in ethnic group that is attributable to each of the three sources of instability.

3.1. Data

The LS is a continuing, prospective record linkage study comprised of census records, vital events and international migration data recorded by the National Health Service (NHS) Central Register, for approximately 1 per cent of individuals since the 1971 Census (Hattersley and Creeser 1995). Data linking in the LS takes place largely through “tracing,” which involves finding LS members' records on the NHS Central Register. The LS provides a powerful research data base of social and demographic change across the life course of individuals. The sample is based on four birth dates in each year and provides records for some 0.5 million individuals at any one time, together with details of their

household members at the time of each census. However, the quality of the dataset and reliability of results is limited by the extent to which complete linkage is achieved (Blackwell et al. 2003).

Our use of the LS to study the stability of ethnic group is limited to those who were recorded in both the 1991 and 2001 Censuses and had valid ethnic group information. Table 3 summarises the sample used for the analysis. A total of 543,884 LS members were selected from the 1991 Census, of whom 419,906 were also present at the 2001 Census. Of those present at the 1991 Census, 535,018 were traced in the NHS Central Register, meaning that exit events (deaths or emigrations) could be linked to their records. Linkage of event data is much less likely if cases are untraced. Among the sample traced at the 1991 Census, 475,381 individuals were eligible to be found in the 2001 Census (not known to have died or emigrated) and of these, 88 per cent were linked to records in 2001 (418,207 cases). The percentage linked between two censuses varied between ethnic groups, dropping below 80 per cent for many of the groups other than White. However, the NHS Central Register is known to be a significantly incomplete record of international migration (Hattersley 1999), and therefore the majority of these unlinked records may be those of migrants not identified as such by the health service, and therefore not actually present at both censuses. Unsurprisingly, there is evidence presented in the next section that those who were not linked are more likely to be subject to unstable ethnic group, and therefore we must accept that our estimates of stability are optimistic. Records with ethnic group missing in 2001 (1,548) could not be used in analysis; overall 417,548 cases were used in this study.

3.2. Measurement of Stability in Ethnic Group

The LS is the only data source which shows how individuals have changed their ethnic group over a period of 10 years. Tables 3 and 4 show the number n_{ij} of LS linked records that were of ethnic group i in 1991 and ethnic group j in 2001. In what follows, n_{ii} is the number of records whose label in 2001 agrees with that of 1991; $n_{i.}$ and $n_{.i}$ are the total number of records of label i in 1991 and 2001 respectively, while n_{ii} is the total number of linked records. $I91$ and $I01$ are the number of categories in 1991 and 2001, respectively. In Table 4 $I91$ and $I01$ are both equal to 2, while Table 5 uses the standard classifications in which $I91$ is 10 and $I01$ is 16.

The instability of an ethnic group classification has some similarity with social mobility and the permeability of social barriers, which have been analysed with log-linear modelling (Gilbert 1993). There are also parallels with population geography, which may be seen as the classification of people into categories of residential address. We are not aware of a developed methodical approach to measuring the stability of ethnic group categories over time, and have created appropriate measures for this study.

For a specific group label i which appeared in the output for 1991 and for 2001:

The *stability* or *degree of fit* is the percentage of those with the label at the first time who keep the same label. $s_i = n_{ii}/n_{i.}$

The *marginal fit* is the agreement between the populations at the two time points, expressed as a ratio of the second to the first. $m_i = n_{.i}/n_{i.}$

Table 4. Ethnic group in 1991 and 2001: White contrasted with other groups

1991 ethnic group	2001 ethnic group		Total 1991	1991 distribution (%)	Degree of fit (%)	Marginal fit (%)	Two-directional fit (%)
	White	All others					
White	390,460	2,122	392,582	94.0	99.5	99.8	99.1
All others	1,467	23,465	24,932	6.0	94.1	102.6	86.7
Total 2001	391,927	25,587	417,514	100.0			
2001 distribution (%)	93.9	6.1	100.0				
Summary measures							
Stability (%)	99.1						
Mean degree of fit (%)	96.8						
Marginal fit (1 df)	9.0	$p = .0026$					

Source: ONS Longitudinal Study.

Table 5. Transition in ethnic group between 1991 and 2001

Ethnic group in 1991	Ethnic group in 2001																Total
	White or White British			Black or Black British			Asian or Asian British				Chinese or Other		Mixed				
	British	Irish	Other	Caribbean	African	Other	Indian	Pakistani	Bangladeshi	Other	Chinese	Other Ethnic Group	White & Black Caribbean	White & Black African	White and Asian	Other Mixed	
Frequencies																	
White	380,096	4,704	5,660	165	68	51	126	99	29	113	67	127	367	98	487	325	392,582
Black Caribbean	205	10	22	2,617	22	264	8	5		12			194	7		26	3,392
Black African	84	4	11	30	956	42	24	4		7		5	9	41		13	1,235
Black	148	4	38	255	38	103	24	20		21		14	396	79	20	66	1,235
Other																	
Indian	156	10	34	16	22	4	7,825	48	5	381				5	51	18	8,596
Pakistani	96		10		7		49	3,960	11	134					35	5	4,310
Bangladeshi	40						17	14	1,543	25					9	4	1,652
Other groups – Asian	44		8	9	18	16	197	66	12	451	38	390	3		31	58	1,341
Chinese	24						3			1,017	48				6	20	1,118
Other groups – Other	313	5	201	68	21	35	81	68	13	141	26	144	300	79	354	204	2,053
Total	381,206	4,737	5,984	3,160	1,152	515	8,354	4,284	1,627	1,285	1,148	752	1,269	309	993	739	417,514
Per cent of 1991 group																	
White	96.8	1.2	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	100.0
Black Caribbean	6.0	0.3	0.6	77.2	0.6	7.8	0.2	0.1	0.0	0.4	0.0	0.0	5.7	0.2	0.0	0.8	100.0
Black African	6.8	0.3	0.9	2.4	77.4	3.4	1.9	0.3	0.4	0.6	0.0	0.4	0.7	3.3	0.0	1.1	100.0
Black	12.0	0.3	3.1	20.6	3.1	8.3	1.9	1.6	0.7	1.7	0.0	1.1	32.1	6.4	1.6	5.3	100.0
Other																	
Indian	1.8	0.1	0.4	0.2	0.3	0.0	91.0	0.6	0.1	4.4	0.0	0.2	0.0	0.1	0.6	0.2	100.0
Pakistani	2.2	0.0	0.2	0.0	0.2	0.0	1.1	91.9	0.3	3.1	0.0	0.1	0.0	0.0	0.8	0.1	100.0
Bangladeshi	2.4	0.0	0.0	0.0	0.0	0.0	1.0	0.8	93.4	1.5	0.0	0.0	0.0	0.0	0.5	0.2	100.0
Other groups – Asian	3.3	0.0	0.6	0.7	1.3	1.2	14.7	4.9	0.9	33.6	2.8	29.1	0.2	0.0	2.3	4.3	100.0
Chinese	2.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	91.0	4.3	0.0	0.0	0.5	1.8	100.0
Other groups – Other	15.2	0.2	9.8	3.3	1.0	1.7	3.9	3.3	0.6	6.9	1.3	7.0	14.6	3.8	17.2	9.9	100.0
Total	91.3	1.1	1.4	0.8	0.3	0.1	2.0	1.0	0.4	0.3	0.3	0.2	0.3	0.1	0.2	0.2	100.0

Table 5. Continued

Ethnic group in 1991	Ethnic group in 2001																Total
	White or White British			Black or Black British			Asian or Asian British				Chinese or Other		Mixed				
	British	Irish	Other	Caribbean	African	Other	Indian	Pakistani	Bangladeshi	Other	Chinese	Other Ethnic Group	White & Black Caribbean	White & Black African	White and Asian	Other Mixed	
Per cent of 2001 group																	
White	99.7	99.3	94.6	5.2	5.9	9.9	1.5	2.3	1.8	8.8	5.8	16.9	28.9	31.7	49.0	44.0	94.0
Black Caribbean	0.1	0.2	0.4	82.8	1.9	51.3	0.1	0.1	0.0	0.9	0.0	0.0	15.3	2.3	0.0	3.5	0.8
Black African	0.0	0.1	0.2	0.9	83.0	8.2	0.3	0.1	0.3	0.5	0.0	0.7	0.7	13.3	0.0	1.8	0.3
Black Other	0.0	0.1	0.6	8.1	3.3	20.0	0.3	0.5	0.6	1.6	0.0	1.9	31.2	25.6	2.0	8.9	0.3
Indian	0.0	0.2	0.6	0.5	1.9	0.8	93.7	1.1	0.3	29.6	0.0	2.8	0.0	1.6	5.1	2.4	2.1
Pakistani	0.0	0.0	0.2	0.0	0.6	0.0	0.6	92.4	0.7	10.4	0.0	0.4	0.0	0.0	3.5	0.7	1.0
Bangladeshi	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	94.8	1.9	0.0	0.0	0.0	0.0	0.9	0.5	0.4
Other groups	0.0	0.0	0.1	0.3	1.6	3.1	2.4	1.5	0.7	35.1	3.3	51.9	0.2	0.0	3.1	7.8	0.3
Chinese	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	88.6	6.4	0.0	0.0	0.6	2.7	0.3
Other groups	0.1	0.1	3.4	2.2	1.8	6.8	1.0	1.6	0.8	11.0	2.3	19.1	23.6	25.6	35.6	27.6	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: ONS Longitudinal Study, authors' analysis. Omitted counts are less than three; they are taken as zero for total and percentage calculations.

The *two-directional fit* is the percentage of those ever having the label who keep the same label. It is symmetrical with respect to 1991 or 2001, unlike the previous two measures which rely on an ordering of the two time points. $t_i = n_{ii}/(n_{i.} + n_{.i} - n_{ii})$

For the entire classification, the measures of stability are derived from those for each group:

The overall *stability* is the total percentage of the population that have not changed labels. Note that the stability is the mean of the degrees of fit weighted by the original population. $s = \sum_i n_{ii}/n_{..} = \sum_i (n_{i.}/n_{..})s_i$

The *mean degree of fit* is the unweighted mean of the degrees of fit. $\bar{s} = \sum_i s_i/I_{91}$. It gives equal weight to each category.

The overall *marginal fit* is measured by the chi-squared statistic comparing the distribution of ethnic group labels on the first occasion with the distribution on the second occasion. This is the only measure which requires the same category labels in each classification, $m = \sum_i (n_{.i} - n_{i.})^2/(n_{.i} + n_{i.})$. The marginal fit measures the extent of divergence between the 1991 and 2001 distributions. If one assumes that they are each an independent manifestation of an underlying distribution estimated by their mean, then the divergence can be tested statistically using $i-1$ degrees of freedom.

Table 4 illustrates these measures using just two categories of ethnic group. The degree of fit for the 1991 White group was relatively high at 99.5 per cent, but lower for those other than White, at 94 per cent. Because the second category is smaller, those who changed to White in 2001 were fewer than those moving from White to another category.

Taking the LS as an approximate one per cent sample, Table 4 suggests that over 350,000 people in England and Wales crossed the boundary between White and other ethnic groups between the 1991 and 2001 Censuses, with asymmetry of movement demonstrated by the marginal fit. These population changes due to shifts of individuals' recorded ethnic group are separate from the effect of births, deaths and migration on each population. The two-directional fit emphasises the turnover within each category and is always less than the degree of fit, as it expresses those who stayed in a category as a percentage of all those who were ever in that category, rather than just those who were in the category in 1991.

The overall measures of fit for the dichotomous ethnic group classification suggest that the changes are not ignorable. The stability of 99.1 per cent shows that one per cent of the entire population crossed the White/Not-White divide. Finally, although movement was in both directions, the distribution of ethnic group also changed by a statistically significant amount.

Table 5 shows individual transitions between the 10 1991 and 16 2001 ethnic categories used in census outputs, presenting the column and row percentages for transition between the categories. It is clear that individual shifts were much more likely among some categories. For example, just 20 per cent of people in the 2001 Black Other group had been recorded in the same ethnic group in 1991, compared with around 83 per cent of 2001 Caribbeans recorded in the 1991 Caribbean group. Consideration of the three measures of stability also demonstrates that some categories have much greater stability than others (Table 6). The overall stability for the ethnic categories shown in Table 6 is less than when the population is divided into only two categories, because it includes instability caused by moves between minority ethnic categories. While 98.0 per cent of the population kept the

Table 6. Stability of ethnic categories 1991–2001

Ethnic group	Measure of stability		
	Degree of fit / stability (%)	Marginal fit (%)	Two- directional fit (%)
White	99.5	99.8	99.1
Caribbean	77.2	93.2	66.5
African	77.4	93.3	66.8
Other Black	8.3	41.7	6.3
Indian	91.0	97.2	85.8
Pakistani	91.9	99.4	85.5
Bangladeshi	93.4	98.5	88.9
Chinese	91.0	95.8	81.4
Other Asian	33.6	102.7	20.7
Other	7.0	36.6	5.4
<i>All (stability)</i>	98.0		
<i>Mean</i>	67.0		

Source: ONS Longitudinal Study.

same group label in 2001 as in 1991, the mean degree of fit across the 10 categories of 1991 averages only 67 per cent. For the people in the residual groups “Other Black,” “Other Asian” and “Other,” many fewer than 50 per cent remained in the same group. Even the group labels “Caribbean” and “African,” less ambiguous as they are not residual to other categories, have a stability of only 77 per cent. One in four of those recorded as Black African or Black Caribbean in 1991 were recorded in a different group in 2001. In Table 6, we cannot measure the overall marginal stability as the categories are different on the two occasions. The move away from White noted above is mainly accounted for by those who moved to a Mixed category.

3.3. Sources of Change in Ethnic Group

We can measure the overall impact of conscious changes of identity over a decade, as a residual aspect of ethnic group change, after accounting for the effect of unreliability and question change. The results we have presented on the overall change in ethnic group observed in the LS are presented alongside evidence on unreliability from the 1991 Census Validation Survey (CVS) and evidence on question change and unreliability from the LFS in Table 7. Here we assume that conscious changes in identity during the one year 2000–2001 between LFS questions are insignificant compared to those that would occur during the ten-year period between censuses.

The LS evidence shows that the ethnic group question worked well for the White population, identifying a group of individuals who, in the vast majority cases, did not change category from one occasion to another, despite development of the question asked and an interval of 10 years between data collection points. Comparison of LS results with the 1991 CVS shows that 0.4 per cent of the 0.5 per cent of change that occurred in the decade would have occurred in the weeks following the 1991 Census, due to unreliability of the question and to the coding and imputation of omitted responses. There were significant changes of ethnicity associated with the choice of

Table 7. *Degree of fit of 2001 Census ethnic group question to the 1991 Census ethnic group question*

Ethnic categories	Degree of fit		
	1991 Census Validation Survey (%)	LFS with 2001 question (%)	LS 1991–2001 (%)
White	99.6	99.3	99.5
Black	88.0	82.6	76.1
Asian	98.7	95.2	97.5
Other	78.1	26.9	37.9

Sources: 1991 Census Validation Survey, reproduced from OPCS, 1994; Labour Force Survey 2001; ONS Longitudinal Study; derived from Tables 1, 2, and 4.

the new Mixed labels but the numbers involved are small in relation to the size of the White group as a whole.

For the Black groups, the degree of fit of 2001 to 1991 responses is much lower, at 76 per cent. Evidence from the CVS shows that unreliable responses alone caused about half of the overall instability among Black groups, or around 12 per cent of changes in group. Consideration of the LFS data shows that question changes, which offered mixed Black African-White and Black Caribbean-White labels, thereby reducing affiliation to the Other Black label, added further instability of around 5 per cent. If we take changes in consciously held identity as the remaining instability measured by the LS, not attributable to question change and unreliable responses, these amount to around 6 per cent of all individuals who were recorded as Black in 1991.

Asian groups are relatively stable in their identification with the labels offered by the Census, with an overall degree of fit of 97.5 per cent measured by the LS; again, evidence from the CVS suggests that about half of instability among Asians was due to unreliable responses. The degree of fit based on the LFS is lower than that measured by the LS, suggesting that the mode of administering the question (face-to-face interview in the LFS versus self-completion of the Census form) may also have some effect on the stability of responses. There will be some conscious shifts in self-identified label over the 10 years, but again this number must be small according to these statistics.

The LS identifies those values for ethnic group which were imputed in 2001 by the Census Office when the information was not recorded by the respondent. The proportion of 2001 census records that were imputed was 2.9 per cent, but falls to 2.1 per cent among Longitudinal Study members linked between the 1991 and 2001 Censuses, confirming that census records that can be linked are among those with more complete responses. We can judge the success of imputation in 2001 by its agreement with the 1991 category; if imputation were completely successful the match should be no less than the degree of fit for all records given in Table 6. The final column of Table 8 shows this to be far from the case. The methodology works best for those with the White label in 1991, because they tend to live in all-White neighbourhoods. For all other groups, who tend to live in diverse neighbourhoods, the method is unsuccessful at least 50 per cent of the time. Overall, however, individual transitions between ethnic categories attributable to imputed values in 2001 account for 9.6 per cent of the observed instability between 1991 and 2001.

Table 8. Imputation of ethnic group 2001 for each 1991 ethnic group

Ethnic group in 1991	All records		Ethnic group imputed in 2001		Imputed to a different category in 2001	
	<i>N</i>	%	<i>N</i>	% of group	<i>N</i>	% of imputed
White	392,582	94.0	8,027	2.0	201	2.5
Black Caribbean	3,392	0.8	167	4.9	117	70.1
Black African	1,235	0.3	48	3.9	45	93.8
Black Other	1,235	0.3	74	6.0	73	98.6
Indian	8,596	2.1	238	2.8	121	50.8
Pakistani	4,310	1.0	182	4.2	91	50.0
Bangladeshi	1,652	0.4	67	4.1	40	59.7
Chinese	1,118	0.3	43	3.2	16	88.9
Other groups – Asian	1,341	0.3	18	1.6	36	83.7
Other groups – Other	2,053	0.5	80	3.9	80	100.0
All groups	417,514	100.0	8,944	2.1	820	9.2

Source: ONS Longitudinal Study.

Since a similar proportion of values of ethnic group were imputed in the 1991 Census, erroneous imputation might contribute up to one fifth of instability.

4. Stability in Context

This section finds that ethnic group measured by the census is less stable than the life-time demographic variables sex and country of birth. Lesser stability is shown at younger ages, but the greatest stability is shown by those born in countries associated with the ethnic group labels.

4.1. *Stability of Ethnic Group, Sex and Country of Birth*

Sex and country of birth are variables that one would only expect to change over a life-time in exceptional circumstances. However, both are subject to response and coding error; country of birth is additionally ambiguous in the context of geopolitical change. These results are taken from Simpson and Akinwale (2004).

Of the 0.2 per cent of LS records with changes to sex between 1991 and 2001, three quarters are attributable to missing values which were erroneously imputed in either year. Regarding country of birth, 2.5 per cent of those who in 1991 claimed to have been born outside the UK, claimed UK birth in 2001. Only a quarter of this instability can be blamed on inaccurate imputation of missing country of birth. For individual countries of birth, the degree of fit is often under 90 per cent. Instability is probably most likely for those who are not living in their country of birth, whose country of birth has changed its name or boundaries during their life-time, whose country of birth is different from that of other household members, or whose regard for their country of birth is relatively low (which may be affected by political changes such as the devolution of powers to Wales, Scotland and Northern Ireland in the 1990s).

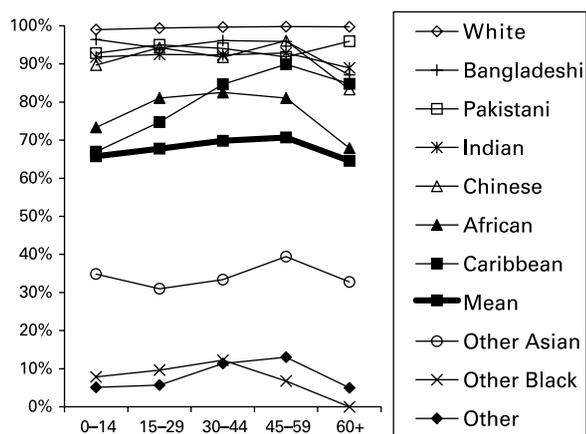
The stability of an individual's ethnic group label is more akin to country of birth than to sex. The large mainly indigenous White group is much more stable than the rest of the population. Imputation in 2001 alone accounts for around one tenth of this instability, although this proportion is greater for some groups than for others.

4.2. *Age*

Figure 3 shows the degree of fit for cohorts defined by their age in 1991. Other measures of stability show very similar patterns. The differences between groups, and the severe lack of stability for the residual groups, are evident at each age.

In general, the degree of fit of ethnic group rises with age. The younger groups contain higher proportions of those born in the UK and those with parents of different origins, for whom the ethnic group question may be ambiguous. These factors may explain the strongest relation of stability with age for the Caribbean group. The youngest group also contains people who were children in 1991 but would have been old enough to complete their own census form in 2001. This change from proxy responses to self-completion might be expected to introduce instability but the effect is not large in Figure 3.

In contrast to the general rise in stability with age, most groups show a decline for the very oldest group who were aged at least 60 in 1991 and surviving to 2001. While this



Source: ONS Longitudinal Study. Age as in 1991.

Degree of fit: the percentage of the 1991 group which kept the same ethnic group.

The bold line shows the mean degree of fit.

Excludes records for which ethnic group was imputed in 2001.

Fig. 3. Age and stability of ethnic group

cohort is small and for some groups is represented by less than 100 members of the Longitudinal Study, the decline is noticeable also for the larger Indian and Caribbean groups. Older people may find the question more difficult to answer, or less acceptable, and this is a finding that deserves further study. Figure 3 excludes imputed records, which therefore can be ruled out as a reason for the drop in stability for the oldest group.

4.3. Stability of Ethnic Group and Whether Born in Britain

As most of the groups identified by the ethnic group question have immigrant origins in the past 50 years, one might expect those who identify with their country of origin to be most comfortable and stable with the label. The census allows us to examine the country of birth of each person along with the stability of their ethnic group between 1991 and 2001. Among the White group of 1991, for example, only 0.1 per cent of those born in the UK changed their ethnic group to another, while 1.7 per cent of those born outside the UK chose a group other than White in 2001. White is a very stable category but there are sub-groups of White people for whom the question is not so straightforward; these may include those with origins in the Middle East and Eastern Europe.

Table 9 shows the percentage of those who changed from their 1991 ethnic group to another in 2001, separately for selected ethnic groups and three categories of country of birth. It excludes those who moved to the new Mixed labels, whose move is associated with the changes in the census question. We have distinguished those born in countries or regions corresponding with an ethnic group label, thus Pakistan for "Pakistani," China for "Chinese," anywhere in Africa for "African" and so on. It is clear that those born in a country presented in an ethnic group label have least difficulty identifying with it at each census. Among the minority ethnic groups considered, those born in the UK are generally more uncertain of their ethnic group label, while those born elsewhere in the world are

Table 9. *Percentage changing 1991 ethnic group in 2001, and country of birth*

1991 ethnic group	Place of birth		
	Born in country corresponding with ethnic group label	Born in the UK	Born elsewhere
Caribbean	5.3	20.4	45.9
African	5.2	26.8	65.2
Indian	4.5	10.9	40.0
Pakistani	3.9	5.9	18.3
Bangladeshi	3.0	5.1	25.0
Chinese	0.7	5.0	14.0

Source: ONS Longitudinal Study, excluding records with ethnic group imputed in 2001. Country of birth as in 2001.

least certain of all. Thus a stable identification with ethnic group labels depends on the relation of those labels to the individual's own history.

5. Amalgamation of 2001 Groups to Provide a Classification Compatible with 1991

Previous sections have established that when comparing data from the 1991 and 2001 Censuses, the two sets of ethnic groups only fit approximately, and have measured the extent to which this is the case. Table 10 presents an amalgamation of 1991 and 2001 classifications to create a stable set of categories, with close approximation to populations identified by both censuses. Alternative amalgamations of categories, based on data from the Longitudinal Study in Tables 4 and 5, were assessed by the measures of stability described earlier.

The allocation of categories in Table 10 has been adopted by the Office for National Statistics (ONS 2006). The analyses that gave rise to this preferred eight-category classification when comparing 1991 and 2001 data are reported in Simpson and Akinwale (2006, Sections 5 and 6). In summary:

- The three White categories of 2001 are amalgamated, as over 94 per cent of people in each of them were coded as White in 1991.
- The residual categories of 1991 – Other Black, Other Asian, and Other – are each of a different nature from the categories of the same labels in 2001, mainly due to the introduction of new question categories and coding schemes. The reliability of each is under 35 per cent (Table 6 above) and is not greatly improved by amalgamation with other categories.
- The correspondence between the Mixed categories of 2001 and any of the 1991 categories is low. None of the 1991 categories contribute as much as one half to a 2001 Mixed category.

In the eight-category classification of Table 10, the Other category is a very diverse collection of residual origins and should not be compared between 1991 and 2001. The most stable category is White, with 99.5 per cent retaining that label. Indian, Pakistani, Bangladeshi and Chinese each have a relatively high degree of fit, between 91 per cent and

Table 10. Eight-category classification

Presentation group	1991 categories	2001 categories	Degree of fit (%)	Marginal fit (%)	Two-directional fit (%)
White	White	White Briton Irish Other White	99.5	99.8	99.1
Indian	Indian	Indian	91.0	97.2	85.8
Pakistani	Pakistani	Pakistani	91.9	99.4	85.5
Bangladeshi	Bangladeshi	Bangladeshi	93.4	98.5	88.9
Caribbean	Caribbean	Caribbean	77.2	93.2	66.5
African	African	African	77.4	93.3	66.8
Chinese	Chinese	Chinese	91.0	102.7	81.4
Other	Other Black	Caribbean / White	62.8	126.6	38.3
	Other Asian	African / White			
	Other	Asian / White			
		Other Mixed			
		Other Black			
		Other Asian			
		Other			

Measures of fit derived from the ONS Longitudinal Study.

94 per cent retaining these labels from 1991 to 2001. Caribbean and African have lower stability, each at 77 per cent.

It is not sensible to recommend a comparison of 1991 and 2001 census ethnic group with fewer than eight categories. Researchers agree that broad categories such as “Asian” and “Black” should be avoided because of the heterogeneity between for example Indian, Pakistani and Bangladeshi. There are two circumstances when such broad categories are nonetheless necessary. Firstly, when relating census data to another source with only broad categories, the objective should be to match available categories. Secondly, when combining categories in a subnational area the objective should be to amalgamate to give sufficiently large populations for analysis, which will be dependent on the subpopulations concerned. In the UK, when combining groups to create a single “Black” category, the categories Other Black, Mixed Black Caribbean-White and Black African-White will normally be included with Black Caribbean and Black African, but the 1991 category Other Asian will not normally be included with Indian, Pakistani and Bangladeshi as it refers mainly to the Far East and Mixed origins.

6. Discussion

We have found that the ethnic group variable has more instability than other demographic variables which are considered constant over a life-time, such as sex and country of birth. Instability varies between groups. It exceeds 20 per cent for the African and Caribbean categories; these populations have the longest settlement in the UK and the largest propensity to intermarry. The instability in England and Wales is partly an inevitable result of the change in question between the 1991 and 2001 Censuses. But an equally large role is played by the unreliability of the question, arising from the ambiguity that the categories offer to some respondents and leading to different responses when asked the same question on different occasions. The question will continue to develop to reduce the numbers allocating themselves to residual “Other” categories by including categories for groups newly created by more recent migration. This article has also provided evidence that instability will grow over time as it is associated with two populations that are themselves growing: the number of residents born in the UK from ethnic groups other than White, and the number of residents with an evident choice between labels (such as Mixed origins and Irish origins).

In concentrating on the stability between 1991 and 2001, we have not investigated the properties of these new 2001 categories in depth, as others surely will use this same longitudinal dataset. For example, to what extent can a demographic category of Irish descent be constructed from Census data, and what relationship does it have to those who, in 2001, declared their “cultural background” to be Irish? To what extent do those with Mixed parentage choose that label, and how does this change when they have left the parental home? We have only touched the surface of the associates of instability, showing its relationship with age and most strongly with country of birth. Those born in the countries that are not named in Britain’s ethnic group labels are less secure in adopting those labels, whether born in the UK or elsewhere overseas. The role of life events such as leaving home, marriage and parenthood, and of the composition of the household and community in which one lives, deserves a detailed and multivariate analysis.

We have found that seven categories (Black African, Bangladeshi, Black Caribbean, Chinese, Indian, Pakistani, and White) have been relatively stable in England and Wales, when measured both by the proportion that stay in their category over 10 years (the degree of fit) and by the lack of bias as a result of the changes that do take place (the marginal fit). The question can be said to work particularly well for the White population.

Our recommended comparison of 1991 and 2001 data in England and Wales using these seven best-fitting ethnic group categories and one residual category will help to monitor changing social conditions. Other challenges for a meaningful census time series of ethnic group populations are differential nonresponse, changed population definitions and changed geographical boundaries. Research using a longitudinal study where ethnic group is measured on more than one occasion must make the additional decision of which occasion to prioritise. While the most recent occasion may be best understood, a previous measurement may be more suitable to the early influences on the life course. When a study focuses on a single ethnic group, it will make sense to explore differences between those who have stayed in the group and those who have changed. Finally, if imputation of ethnic group is inaccurate for those not in the White group as in the UK 2001 Census, these records should be omitted or used with caution.

There are certainly significant ambiguities in the ethnic group question in UK Censuses which have not been resolved. Indeed, they are likely to grow in time as the dimensions of colour and country-of-origin that underlie the current question are ambiguous for increasing numbers of individuals who have diversely mixed parentage or UK birthplace. Resolution of the ethnic group question is also complicated by an underlying tension between the need for a stable time series with which to assess the effect of current social policy, and the need to keep up with the evolving complexity of a diverse society in order to formulate new social policy. The main streams of post-1950 immigration which the 1991 categories captured may be still be measured by increasing appeal to the country of origin of ancestry. At the same time, new streams of immigrants from within Europe and the Middle East require new categories. The bridging between new and old classifications will be a continuing challenge, which would be best met by well-designed surveys complementary to the census and designed both to assess old classifications and to develop new ones.

Note: The full census titles of each category of ethnic group include both the section heading and the tick-box label in 2001, and are long to the extent of burdening discussion. Standard shortened labels are used in this article.

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