```
CMPLE.K=TABHL(CMPLET,PLE.K,0,80,10)                          36, A
CMPLET=3/2.1/1.6/1.4/1.3/1.2/1.1/1.05/1                      36.1, T
    CMPLE  - COMPENSATORY MULTIPLIER FROM PERCEIVED LIFE
               EXPECTANCY (DIMENSIONLESS)
    TABHL  - A FUNCTION WITH VALUES SPECIFIED BY A TABLE
    CMPLET - CMPLE TABLE
    PLE    - PERCEIVED LIFE EXPECTANCY (YEARS)

PLE.K=DLINF3(LE.K,LPD)                                       37, A
LPD=20                                                       37.1, C
    PLE    - PERCEIVED LIFE EXPECTANCY (YEARS)
    DLINF3 - THIRD-ORDER EXPONENTIAL INFORMATION DELAY
    LE     - LIFE EXPECTANCY (YEARS)
    LPD    - LIFETIME PERCEPTION DELAY (YEARS)
```

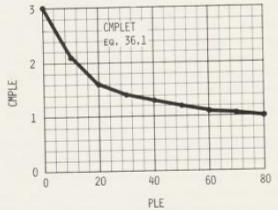

Figure 2-66 Compensatory multiplier from perceived life expectancy table

rate caused by the slow social response to the lowered mortality, the long-term balance between birth and death rates could also lead to an increase in the net growth rate, or at best the same rate that prevailed before.

To assess the possible effectiveness of reduced infant mortality as a policy for regulating population growth rates, it is necessary to understand better the delays and biases in the information individual families receive about survival probabilities. If it is assumed, as in the World3 standard model, that the perception delay is relatively long but the information is accurate, then mortality reduction as a population control policy is counterproductive in the short term and ineffective in the long term. Other assumptions can easily be incorporated in the model by changing the numerical values of the lifetime perception delay LPD and the table expressing the compensatory multiplier CMPLE. The sensitivity of the system to such changes is shown in section 2.6.

In World3 the second variable contributing to total fertility TF is the desired completed family size DCFS, which is the ultimate average number of surviving children each family strives to achieve. The desired completed family size DCFS in World 3 is represented as a function of two contributing factors: the average number

of children considered ideal by the society as a whole, and the average number of children actually desired by families within the society as they weigh their own resources against this socially established norm. In World3 we call the general societal norm the social family size norm SFSN and the individual response to that norm the family response to social norm FRSN. These two variables are formulated as nonlinear table functions multiplying a normalized constant, the desired completed family size normal DCFSN.

```
DCFS.K=CLIP(2.0,DCFSN*FRSN.K*SFSN.K,TIME.K,ZPGT)             38, A
ZPGT=4000                                                    38.1, C
DCFSN=4                                                      38.2, C
    DCFS   - DESIRED COMPLETED FAMILY SIZE (DIMENSIONLESS)
    CLIP   - A FUNCTION SWITCHED DURING THE RUN
    DCFSN  - DESIRED COMPLETED FAMILY SIZE NORMAL
               (DIMENSIONLESS)
    FRSN   - FAMILY RESPONSE TO SOCIAL NORM
               (DIMENSIONLESS)
    SFSN   - SOCIAL FAMILY SIZE NORM (DIMENSIONLESS)
    TIME   - CURRENT TIME IN THE SIMULATION RUN
    ZPGT   - TIME WHEN DESIRED FAMILY SIZE EQUALS 2
               CHILDREN (YEAR)
```

The CLIP function allows the modeler to test the impact on the system of an invariant desired completed family size of two children at any specified time ZPGT. This option does not assure an actual total fertility of two, since the factors of birth-control effectiveness and compensation for perceived child mortality are still operative. It merely assumes that the family size goal of the global society is constant at two children. This option must be specifically activated by the modeler; it does not operate in standard model runs.

In World3 the desired completed family size normal DCFSN was set at four children. The two multiplying table functions, SFSN and FRSN, operate to adjust the average desired completed family size from a high of 5 to a low of 1.5 children, depending on the social and economic conditions affecting the population. Again, the normal value does not signify any inherent property of the real-world system; it is an arbitrary number to serve as a base for constructing the modifying table functions.

Although a great many surveys of desired family size have been carried out, it is not always possible to determine whether those studies have measured desired total fertility (including compensation for infant mortality), desired completed family size for individual couples, or the societal "ideal." The wording of the question regarding desired family size is obviously important, and in most surveys the words seem to emphasize either the social norm or the individual decision, including mortality compensation. For example, surveys in various countries (Mauldin 1965) have included the following questions:

> *United States:* What do you think is the ideal number of children for the average American family?
>
> —Just before you were married, how many children did you think you would want during your married life?
>
> —A year after your first child was born how many children did you want to have altogether?